NEIRONIX
Rating Methodology
1. NEIRONIX Rating Methodology
   1.1 Practical use of ratings
   1.2 Methodology for evaluating reliability of ICO projects
   1.3 NEIRONIX goal
   1.4 NEIRONIX criteria
   1.5 Key target audience
2. NEIRONIX Operation Process
   2.1 Establishment of criteria for risk factors
   2.2 NEIRONIX sandbox
3. Risk Identification
   3.1 Technical cluster
   3.2 Structure cluster
   3.3 Process cluster
   3.4 Logical-mathematical cluster
4. Risk Analysis
   4.1 Technical cluster
   4.2 Structure cluster
   4.3 Process cluster
   4.4 Logical-mathematical cluster
5. Risk Evaluation Process
6. Monitoring of ICO Projects
7. NEIRONIX Final Rating
The notion "rating" means comprehensive assessment of same-type objects according to unified and comparable scale of values conducted in line with a single algorithm with the use of transparent and accessible methodology. Rating allows unbiased assessment of benefits and drawbacks regarding a certain subject in the competitive environment of similar subjects, either on equal initial conditions or over a certain period of time using a unified evaluation technique.

NEIRONIX project practices comprehensive approach to drawing up the rating using 75 key dynamic risk indicators. This approach makes it possible to draw an objective picture as to the investment attractiveness of an ICO project, and provide potential investors with unbiased information about the key strategic indicators as of the current date and for a long-term period.

Ratings make a substantial impact on the rating subjects as well: public evaluations lay the teams of ICO projects and blockchain startups under certain commitments making them use transparent and fair models of interaction with investors and project stakeholders, as well as reduce to a minimum the likelihood of SCAM projects and wrongdoing on the part of an ICO team.

Along with having the communicative function, ratings are a tool for attracting cheaper investments. Official statistics says that the difference in cost of investment resources between the projects holding outsider positions and the ones boasting of top notch in the rating list amounts to no less than 20%.

The ICO rating process is based on evaluating the totality of essential parameters typical of either rating subjects or their groups. The main principle behind the Neironix rating lies in reduction in the share of expert opinions and increasing the role of the rating's algorithmic and methodological constituent elements.

Position in the rating is defined as relative convergence of expected and actual results, as well as minimal correlation of the evaluation model's explanatory factors. Under convergence, we understand the relationship between the actual financial performance of the rating subject and its position in the list of expected results. A high rating of an ICO project and its subsequent default may mean extremely low convergence and a high level of distrust in the rating.

The methods of drawing up NEIRONIX ratings allow one to analyze many ICO project indicators and identify the group of fundamental factors that influence its financial standing, reliability and investment stability. The objectives of rating also include identifying the stability of such conditions and evaluating their correlation with other important parameters.

To display the actual results of the rating drawing process, the NEIRONIX project uses streamlined scales. The main objective of these scales lies in transforming the collected data arrays into a single and compact system of rating scores that may serve as a guide for potential investors in the development of long-term investment strategy and making decision as to possible cooperation with a blockchain project being expedient or not. This system is also a form for displaying the current condition of ICO. The Neironix project uses a single unified rating scale showing the quantitative indicator of risk level (full or partial loss of investment resources) by way of assigning points (scoring) of 0 to 100, where 0 stands for the highest level of risk, while 100 stands for the highest investment reliability of the project.
1.2 Methodology for evaluating reliability of ICO projects

NEIRONIX is the first independent international rating agency using unique methods for identification of investment risks for crowdfunding projects, ICO and blockchain startups. The main concept of NEIRONIX project relies on complemented and updated international standards of risk management, as well as digital economics built on the basis of trainable neuron networks with the use of scoring matrices, logical-mathematical methods, and algorithms of simulation modelling. The concept makes it possible to unveil negative investment factors and deviations from investment strategy at early stages, as well as detect the uncertainty effects and financial risks.

The terminology and definitions used in this Methodology are based on international public documents and generally accepted sources of international law, namely:

- IEC International Electrotechnical Glossary;
- Directives of ISO/IEC Part 1, 2 (see www.iso.org/directives);
- ISO 21500:2012 – Guidance on Project Management (IDT);
- GOST R IEC 62502-2014 – Risk Management. Event Tree Analysis;
- Generally accepted sources of definitions and terms (ru.Wikipedia.org, edumarket.ru/glossary, etc.).

**Terminology used:**

**Scoring grade** – a system for rapid analysis of key object’s (borrower, project) parameters by way of calculating and awarding a certain number of points for various business purposes. The term “scoring” derives from English "score" – gain points (for instance, in competitions, games, etc.)

**Risk** – influence of uncertainty on goals.

**Risk management** – coordinated activities on control over organization with risks taken into account.

**Risk source** – an element that, in isolation from or in combination with other elements, may lead to risk occurrence.

**Event** – advent or change of a number of certain circumstances.

**Consequence** – result of an event (3.5) having impact on goals.

**Likelihood** – measure reflecting the advent of some event numerically.

**Risk assessment** – full process of identifying, analyzing and evaluating risk.
The main goal of NEIRONIX project’s risk strategy lies in increasing the likelihood of achieving investment objectives and raising the ROI (return on investment) coefficient for all cryptocurrency market players.

To achieve its objectives, NEIRONIX project uses international methodologies and risk management practices fully adapted to blockchain market, scoring algorithms of investment attractiveness assessment, and statistical data collected from all available sources. The methods used enable cryptocurrency investors to control the impact of many uncertainty factors in the context of investment objectives set.

1.3 NEIRONIX goal

The main goal of NEIRONIX project’s risk strategy lies in increasing the likelihood of achieving investment objectives and raising the ROI (return on investment) coefficient for all cryptocurrency market players.

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1.4 NEIRONIX criteria

In its work, NEIRONIX uses the totality of scoring models for assessment and analytical rating methods on the basis of trainable neuron networks. The main criteria of NEIRONIX system’s work include:

Objectiveness – NEIRONIX is an unbiased system functioning with minimum participation on the part of operators (experts, service architects, stakeholders) in automated mode;

Operational efficiency – NEIRONIX is capable of processing and analyzing vast data arrays and millions of factors providing the values of key project parameters to the user within seconds;

Integration – In terms of functionality, NEIRONIX is an open system capable of becoming an integral part of management practice for organization of any form (state agencies, commercial, financial, non-financial organizations, funds, innovation structures);

Multifactor analysis – NEIRONIX is capable of analyzing an ICO project for efficiency taking into account the assessment of macroeconomic data in the sphere of blockchain market and its individual sectors;

Dynamics – NEIRONIX performs analysis and assessment of key parameters of ICO startups, cryptocurrency exchanges, and blockchain markets taking into account that they are subject to continuous changes, which naturally allows it to build up statistical database for forecasting the key processes by way of creating scenarios;

Technological effectiveness – NEIRONIX minimizes the role of human participation in the assessment of ICO projects;

Artificial intelligence – NEIRONIX uses advanced products for search, analysis and distribution of data about ICO projects and situation in the cryptocurrency market;
The use of NEIRONIX risk strategy results in:

- minimization of investment risks;
- provision of toolset and recommendations for risk treatment;
- protection from full or partial loss of investments.

The NEIRONIX methodology for identification and management of risks is not a public offer. The obligations dealing with provision of services with the use of NEIRONIX risk assessment service are finalized by separate programs, products and agreements, under which new requirements and recommendations may be provided in addition to the said Methodology depending upon the user’s needs and volume of risks assumed by the parties.

1.5 Key target audience

- Internet users;
- Individuals investing or intending to invest in ICO projects;
- Institutional investors (venture, cryptocurrency, hedge funds, or other financial organizations);
- Companies of non-financial sector;
- ICO projects;
- Groups of investors;
- Rating agencies;
- Banking institutions;
- Professional traders;
- Institutions of state sector;
- International institutes, organizations and associations.
NEIRONIX operation process envisions a systematic use of established procedures and practices dealing with risk management for providing up-to-date information of high quality about ICO projects to the user, defining the context of external situation in blockchain market, monitoring, analysis, and update of the investor on the status of key risk indicators, as well as risk assessment and treatment.

The NEIRONIX operation process shall be an integral part of processes dealing with control and decision-making by investor. It can be used on the strategic, operating, programming or design level.

When the system is in use, the NEIRONIX process may feature many variants of application adapted to the user’s goals, as well as internal and external context. In particular, the system functions as an analytical data center, information and news channel, site for communications among the cryptocurrency market players, and provider of evaluation data about ICO projects.

Despite the sequence of risk assessment stages during the analysis of blockchain projects, the process of risk management is actually iterative (repetitive).
2.1 Establishment of criteria for risk factors

Risk criteria have to reflect the values, strengths and weaknesses of ICO projects, as well as the general condition of cryptocurrency market. These criteria must be set with startup’s obligations and opinions of stakeholders taken into account.

Risk criteria should be specified at the beginning of assessment process. That said, they are dynamic and are to be continuously reviewed, or even corrected if required.

To set the risk criteria, one should take into account the following:

- Nature and type of uncertainties that may have impact on the results and goals (both tangible and intangible);
- Method of identifying and measuring consequences (both positive and negative), as well as their likelihood;
- Factors related to time;
- Concurrence in the use of measurements;
- Order of identifying risk level;
- Method for recording combinations and sequences of multiple risks;
- Formation of project pool for the purpose of performing comparable comparative assessment of startups (NEIRONIX sandbox).

2.2 NEIRONIX sandbox

For the purpose of identifying the risks of blockchain startups, comparative analysis and assessment of blockchain projects, NEIRONIX system plans to form a pool of registered ICO projects with unlimited number of stakeholders. NEIRONIX sandbox forms a primary statistical database of risk tree system. The sandbox is being built in hierarchical order – the projects are positioned in the table in the descending order in terms of their score, i.e. the ones with the highest score are in the upper part of the table, etc.

<table>
<thead>
<tr>
<th>Risk group 1</th>
<th>Dependent factors</th>
<th>Cumulative effect (joint occurrence of several factors)</th>
<th>Aggregated measures of factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Группа факторов 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Factor 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Group...n</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. Risk tree of NEIRONIX project
For identifying the context of likely events (likelihood), capable of having impact on the return of investments and/or their quantitative indicators, NEIRONIX project uses the principle of multidimensional analysis developed by McKinsey, an international audit company, and therefore named McKinsey Matrix:

![McKinsey Matrix Diagram]

NEIRONIX data storage represents a structure in the form of a set of interrelated nodes (Data Tree) that extends with accumulation of information about the key events, changes and processes in the system of each ICO project, their combination, as well as the cryptocurrency market in general. Data structuring is performed according to the principle of gradation as to the likelihood of events related to investment risk on the basis of hazard level of each specific event in the descending order – from the most likely and dangerous event to the least likely and insignificant one.

**Distribution of analytical information on the NEIRONIX platform** has a cluster structure. The received information is distributed on the basis of its importance, impact on achievement of investment goals, priority and special needs of each specific user.
The objective of risk identification lies in searching for, detecting and describing the risks that may help the organization in achieving its goals or prevent it from meeting the targets. For risk identification, it is very important to use appropriate and relevant information.

NEIRONIX system uses a number of methods for identification of uncertainties that may have impact on meeting the targets by cryptocurrency investor. That said, one should take into account the following factors and their interrelation:

- Tangible and intangible risk sources;
- Causes and events;
- Threats and opportunities;
- Sensibilities and capabilities;
- Changes in cryptocurrency market landscape and internal situation (status of each individual ICO project);
- Indicators of arising risks;
- Nature and cost of cryptocurrency investments;
- Consequences and their impact on return of investor’s funds.

For making investment decision, the user has to be aware of and understand the risks, irrespective of whether the risk sources are under his/her control or uncontrollable. One should realize that several outcomes are possible, and that many different tangible and intangible consequences cannot be ruled out. The NEIRONIX system methodology is capable of solving such multidimensional problems providing to the investors as true picture as possible and acceptable variants of risk treatment.

3.1 Technical cluster

The work of technical cluster is based on continuous process of indexation for blockchain sites and ICO aggregators with the use of our own parsing algorithms, special software scripts, as well as neuron networks and capacities of innovative IBM Watson analytical system.

**Briefing Note:**

IBM Watson — IBM’s software solution of “question-answer” type equipped with artificial intelligence on the basis of trainable neuron networks.

Structure of IBM Watson:

- 90 servers IBM P750, each of them consisting of four eight-core IBM POWER7 processors, with a total volume of CPU on the level of 15 Tb;
- simultaneous access to 200 million pages with 4 TB of structured and unstructured information.
Any changes in project structure, such as deviation from Road Map, transformation of investment strategy, as well as introducing corrections to program code in GitHub, are displayed on NEIRONIX site in the form of amendments to statistical indicators in real time.

3.2 Structure cluster

On detection of a risk factor, NEIRONIX system puts it into data storage in accordance with the following matrix:

<table>
<thead>
<tr>
<th>Dynamic factors</th>
<th>Static factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial risks</td>
<td>Assessment in accordance with accumulated statistical data</td>
</tr>
<tr>
<td>Project risks</td>
<td>Assessment on the basis of expert opinion</td>
</tr>
<tr>
<td>Commercial risks</td>
<td>Etc....</td>
</tr>
<tr>
<td>Risks of fraud</td>
<td>Etc....</td>
</tr>
<tr>
<td>Etc....</td>
<td>Factors related to product/service</td>
</tr>
<tr>
<td></td>
<td>Factors related to project</td>
</tr>
</tbody>
</table>

Table 1. Example of structure cluster data storage used by NEIRONIX project

**Dynamic risk factor** – an event or a group of events having impact on return of investments by cryptocurrency or blockchain investor. Dynamic risk factor is a quantitative indicator measured in certain units (number of subscribers, likes, pieces, US dollars, etc.).

NEIRONIX scoring algorithms collect information and analyze the key parameters of a blockchain project in real time reflecting the data obtained in dynamic activity index:

- Traffic of Landing Page and MVP;
- Indexation of MVP by existing search engines;
- Frequency of project mentions in media and on industry WEB resources;
- Activity of project subscribers in social media;
- Number of Likes and Shares in social media aggregators;
- Availability of links to the project and the source leverage;
- Etc.

For the purpose of simplifying the monitoring procedure, we have reached an agreement with existing sites – key blockchain market players and aggregators of crowdfunding ICO projects – on automated transmission of key indicators and changes via API.

**Static risk factor** – an event or complex of events having impact on return of investments with description being assessed by logical answers devoted to presence of this or that risk sign (yes/no).
**Expert assessment of risk factor** – identification of likelihood for a risk factor (weight in scoring matrix) on the basis of expert opinion expressed in special form (questionnaire, fill-in form, commentaries on communications site of cryptocurrency investors, etc.). NEIRONIX blockchain site is a place for accumulating the opinions of independent experts and strategic cryptocurrency market players. Formulation of expert opinion is the process of completing interactive fill-in forms by investors and cryptocurrency market experts, who evaluate the fundamental indicators of ICO. The expert assessment of the project is made on the basis of this very process:

- Quantitative and qualitative assessment of general information;
- Evaluation of product and market potential;
- Technical assessment;
- Team’s achievements and reputation;
- Road Map and development strategy;
- Marketing strategy;
- Project’s economic rationale;
- Investment attractiveness;
- Quantitative and qualitative risk assessment.

The interactive forms for expert opinion contain a mandatory item – commentaries with substantiation of conclusions made. The policy of NEIRONIX lays experts under the obligation to substantiate the conclusions providing extended commentaries (at least 250 characters).

An expert score is assigned to the project (scoring) in case of five opinions from independent experts being available. The sum of independent assessments divided by their number is the average scoring value for each section of unbiased rating, which is published on the NEIRONIX site and is publicly available for all categories of project users.

**Statistical assessment of risk factor** – identification of likelihood for a risk factor (weight in scoring matrix) according to statistical data based on multiple chronological observation and measurement of recurring events typical of ICO projects. NEIRONIX system performs data processing in real time.

**Risk factor related to product** – an event having impact on the investor’s target with product/service being developed, tested or launched acting as its source.

**Risk factor related to project** – an event having impact on the investor’s target with business processes related to project management (project team, financial standing, marketing concept of initiators, etc.) acting as its source.

### 3.3 Process cluster

NEIRONIX system performs the identification of risk factors with the help of intellectual search and data processing method in the following order:
• Analysis of ICO project registered in the system by the method of correlating its characteristics to the risk tree factors of NEIRONIX system;
• Detection and registration of identical characteristics and factors missing in the risk tree;
• Measurement of said factors;
• Distribution of project risk factors and their correlation to other factors in the NEIRONIX sandbox;
• Intellectual monitoring test of the project for its activity and condition of key indicators.

3.4 Logical-mathematical cluster

For statistical data acquisition, NEIRONIX, due to its limited capacity, will use some models of mathematical calculation for effective identification of risk factors in the sandbox.

For determination of minimal sample size, in particular, the formula of interval estimation of general role will be used:

\[ P - Z_y \sqrt{\frac{w(1-w)}{n}} \leq P \leq P + Z_y \sqrt{\frac{w(1-w)}{n}} \]

where \( P \) is estimated share of required risk factors in general population, size of original statistical sample, \( w \) is share of assessed factors in test interval, \( z \) is value of normal standard law of distribution depending upon reliability level of \( y \).

Using the aforementioned formula, we can find out the upper and lower confidence limits for estimating general share of risk factors with reliability level of 95%: 0.05 and 0.09. The lower confidence limit for the share of factors with the highest level of risk will be the best from the viewpoint of risk assessment, yet the worst for the determination of minimal sample size. Let us assume that the value is about 0.05 – in this case we need the sample size amounting to about 2,500 projects with 10% relative error of share estimation. In case the share of "negative" outcomes is estimated at 0.09, 1,776 observations will be enough. If we raise the accuracy of estimating general share to relative error of 5%, we will require 9,887 observations (projects).
The objective of risk analysis lies in understanding the nature of risk and its features, including the level of risk if required. Risk analysis implies consideration of uncertainties, risk sources, consequences, likelihoods, events, scenarios, control facilities and their efficiency. An event may have various reasons behind it and consequences, as well as have impact on different goals.

Risk analysis may envision different degrees of detailing and complexity depending upon the objective of analysis, availability and credibility of information and resources that the company has. Methods of analysis may be quantitative, qualitative, or combined depending upon specific circumstances and prospective use of results.

Risk analysis should be performed with the following factors taken into account:

- Likelihood of events and consequences;
- Nature and scale of consequences;
- Complexity and connectivity of components;
- Factors related to time, and volatility;
- Efficiency of existing control facilities;
- Sensitivity and credibility.

### 4.1 Technical cluster

The operation of analytical platform is based on accumulated statistical information about the risk factors of ICO projects, as well as logical-mathematical models of calculating the likelihood of risk events, quantitative assessment of indicators, and total score of a blockchain startup.

### 4.2 Structure cluster

<table>
<thead>
<tr>
<th>Factors</th>
<th>Dynamic (din.)</th>
<th>Static (stat.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expert assessment</td>
<td>Statistical assessment</td>
</tr>
<tr>
<td>$\sum q1(j1))**</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>$\sum q2(j2)$</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>$\sum q3(j3)$</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>$\sum q4(j4)$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\sum qn(jn)$</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Calculation of score and dynamic scoring scale of NEIRONIX

*\*v(j) – likelihood of risk factor \(j1, j2, \ldots, jn\)

**$\sum q(j)$ – quantitative assessment of \(j\) factor
**Score** — ICO project assessment result displayed on dynamic scale (0→100). The scale is formed by the values dealing with quantitative, qualitative and probabilistic assessments of an ICO project. The figures for quantitative assessment of both dynamic and statistical risk factors are set in the form of points that are reduced to a single unified scale "∑qn(jn)" (0→100).

![Dynamic scoring scale (points)](image)

### 4.3 Process cluster

Risk analysis as a process in NEIRONIX system can be represented in the form of the following table:

<table>
<thead>
<tr>
<th>Risk factors</th>
<th>Din.</th>
<th>Quantitative assessment</th>
<th>Probabilistic assessment</th>
<th>Risk level (score)</th>
<th>Level of risk in sandbox</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stat.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

At the first stage, the identified factor is analyzed for static character (changes in real time). The parameter of qualitative assessment is set depending upon the result.

For static factors, the assessment is performed on the basis of logical answers to questions describing the risk factors (yes/no). Quantitative analysis of dynamic factors is based on the results of continuous iteration measurements with periodicity of once per hour. In the course of monitoring, the system recalculates the sum of all figures for a specific factor reducing it to an average-weighted arithmetic value.

The score of quantitative assessment for a risk factor is defined as a coefficient (ratio) between the average-weighted arithmetic value and the value of risk factor indicator.

The probabilistic assessment for each risk factor is performed in the form of estimated coefficient by the method of statistical analysis of key risk indicators at a given time.

Aggregated score is calculated as a product of likelihood coefficient and risk factor quantitative assessment score.

Besides, the NEIRONIX sandbox is used to calculate the average score that reflects the risk level among all ICO projects. Thus, the user can compare the reliability level of a specific startup with the one for all projects of the sandbox.
4.4 Logical-mathematical cluster

Quantitative assessment of static factor is based, as specified in p. 6.6.3, on logical estimation methodology dealing with expert assessment of answers to open-ended questions with regard to risk factors. Certain number of points is assigned to each question, and the project on specific static risk factor receives its own score. It is necessary to take into account the need for assessing both dynamic and static factors using a single unified scoring scale (0→100).

Let us display this process as an example in the form of a table:

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>“Yes” – 100</th>
<th>Partially “Yes” – 50</th>
<th>“No” – 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Road Map opened in NEIRONIX</td>
<td></td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Project team includes CFO (Chief financial officer)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There have been cases of participation in public events, project presentations.</td>
<td></td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>There is ICO page on BT (RU)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>200</td>
<td>50</td>
<td>0</td>
</tr>
</tbody>
</table>

Using given parameters, NEIRONIX algorithms get certain variation of answers with regard to all risk factors. When quantitative variables are added to the model, the system needs to analyze them for multicollinearity. Not enough attention is paid to this problem of model building, though it is relevant for both the use of quantitative predictors and building the model of multiple linear regression. The initial analysis for multicollinearity can be performed on the basis of the matrix of pair and partial correlations between independent variables. However, it is not always that the correlation coefficients can show the presence of multicollinearity. For diagnosing multicollinearity, variable tolerance indicators are often used. These indicators are determined according to the following formula:

$$1 - R_i^2$$

where $R_i$ is squared multiple correlation coefficient of $i$th independent variable with all other predictors. If the variable tolerance is close to zero, the value of this variable can be expressed through the linear combination of other independent variable. Sometimes, instead of tolerance, the indicator inverse to its value is used. It is called dispersion “swelling” coefficient or factor:

$$VIF = \frac{1}{1 - R_i^2}$$
In case multicollinearity is present, the dispersion of regression model parameter estimates is rising proportionally to this value, which makes their assessment unstable. High value of VIF shows the presence of multicollinearity.

The categorization of static factor quantitative variables is performed in accordance with the following algorithm.

Initially, the quantitative variable is broken down into several groups on the basis of equal percentiles. Then, the share of points 0 and 100 is calculated for each group, as well as the weight of categories predictor – WOE indicator. The weights of predictor categories help find the “limits of sensitivity” to risk event occurrence using the variable, and perform the categorization of quantiative variables in the optimal way. WOE indicators for each category are calculated according to the following formula:

\[ WOE = \ln \frac{d\mu}{d\alpha} \]

where \(d\mu\) and \(d\alpha\) are relative frequencies “0” and “100” respectively in the \(i\)th group of categorized variable; \(i=1, 2, \ldots, k\); \(k\) is the number of variable categories.

The mechanism of calculating dynamic risk factor is different from the one for static factor in that the first one should be measured with its change over time taken into account. The indicators of dynamic factors are expressed in the form of votes, monetary units, pieces, etc. In order to estimate the dynamic factor in points, one should bring the indicator for risk factor under consideration into correlation with the statistically average value in NEIRONIX sandbox.

The key assumption in transformation of quantitative assessment to 100-point estimate in this mathematical model is expressed by the following formula:

\[ Qi = \frac{x_i}{2x} * 100 \]

where \(Qi\) is the indicator of dynamic factor quantitative assessment, while \(x_i\) is quantitative indicator of risk factor for specific project and average weighted one of the risk factor in the sandbox:

\[ x = \left\{ \frac{dx_1}{n_1} + \frac{dx_2}{n_2} + \ldots + \frac{dx_n}{n} \right\} * \left\{ \frac{1}{n} \right\} \]

Key assumption of the model:

\[ x = x, \text{ then } Qi \to 0.5 \times \]

\[ x > x, \text{ then } Qi \to \max_{x_{\text{max}}} 2x \lim_{x\to100} \]

The variant of calculating some risk event likelihood depends on the availability or absence of statistical observations for certain factor. In case the statistics for risk factor is missing, the likelihood assessment is performed using an expert method – the one of weighing estimates. Preliminary survey among experts is conducted to find out the significance of factor or group of risk factors. Then the averaging of assessments and smoothing-out of expert opinions is performed, and weight is assigned to each factor on the basis of this process. Eventually, the weights obtained are corrected with mathematical error taken into account. The mathematical model is expressed by the following formula:
\[ f = \frac{W_1}{W_n}; \quad n = \frac{W_1}{W_k} \]

where \( W_1, W_n \) is weight assigned by the expert, \( k \) is a finite order number of risk factor.

After that, the groups of factors with the lowest priority assigned by experts are being found:

\[ W_n = \frac{2}{k*(f+1)} \]

Then, the weights for other priority groups are determined:

\[ W_n = W_i \times \frac{(k-i)*f+i-1}{k-1} \]

In connection with computation error, the weights obtained should be adjusted using the following formula:

\[ W_{1i} = W_{0i}/\sum_{i=0}^{n} W_{0i} \]

It stands to mention that while making our calculations, we have gone away from the classic methods of dividing risk factors into equal clusters for the purpose of reducing the impact of restriction by 100% limit of aggregated weight indicator for all factors. As the practice of foreign experts shows, this is due to the fact that the above mentioned limit is an academic tool alone and has no influence on efficiency of applying scoring model with the use of weighted priorities in practical activities. Therefore, we substantially simplified the computation model, in particular having made unnecessary the averaging of risk factor in all clusters available.

Let us consider the situation, when the risk event likelihood indicator is described by statistics. The key objective of this operation lies in calculation of likelihood as to occurrence of this risk factor in ICO project. That said, the data dealing with the presence of an identical risk factor in other startups and statistics of failed projects with similar parameter are taken into account. The presence of risk factor under consideration in the project shall be understood to mean quantitative assessment of factor “0”, if it is a static factor, while “\( X > X \)”, if the factor is dynamic.

Taking into consideration that quantitative and probabilistic assessment represents iteration process within the framework of NEIRONIX system, as well as taking into account the mutual influence (cumulative effect) and element of dependence of individual risk factors, it is quite natural to use the approach of casual event probability distribution. The final conclusion is possible only as a starting hypothesis. In the process of system operation, it is possible to come across serious random deviations having no features of binominal function distribution. Over the longer term, these fluctuations may bear systematic influence on all indicators and distort the dynamics exponentially. The rules of classic probability theory laws do not apply to the case under consideration. However, NEIRONIX system is ready for solving the non-standard problems of probabilistic assessment in this case as well as using advanced mathematical models tried and tested by experts in risk management (for instance, fractal theory).

If we assume classic distribution of risk factors in an ICO project, the calculation of risk event likelihood is well described by Moivre-Laplace integral limiting formula of asymptotic representation:
\[
\sum_{i=1}^{n} \frac{dx_i}{n^1} + \frac{dx_2}{n^2} + ... + \frac{dx_n}{n} \times \left\{ \frac{1}{n} \right\} \times \left( \frac{p_1+p_2+...+p_n}{n} \right)
\]

Function \( \phi(x) \) is the Gaussian function reflecting the standard deviation of sample index from average value of general population.

\( P_n(k) \) is the likelihood of the event occurring for "k" number of times out of "n" possible ones, \( q = 1 - p \) is the likelihood of event failing to occur. Values \( e^x \) and \( \pi \) are constants.

Initially, the risk factor likelihood will be assessed from the perspective of classic probability theory approaches, from whence the resulting figures are to reflect the values of risk factor frequency distribution in relation to the standard average deviation of general sampled population.

For example, if the likelihood of risk factor for all ICO projects in NEIRONIX sandbox amounts to 0.74 (100 – absolutely likely, 0 – absolutely unlikely, 50 – complete uncertainty) with accumulated statistics taken into account, the likelihood for occurrence of this factor will be calculated taking into consideration its smoothing-out to mean root square deviation from value 0.74 (with the net likelihood measure of 0.81 being adjusted for Gaussian function to 0.78).

The resulting value of score for risk factor is calculated as the product of quantitative indicator (from 0 to 100) multiplied by likelihood indicator (from 0 to 1). Total score is calculated as the product of average weighted arithmetic value of quantitative assessments for all risk factors multiplied by average value of likelihood for all risk factors in ICO project.
The objective of risk evaluation lies in drawing recommendations to assist in making effective investment decisions. Risk analysis is performed with taking into account the data obtained in the process of quantitative and qualitative assessment of identified risks, as well as the likelihood of their occurrence on the basis of each event's hazard level determined by NEIRONIX. The risks are evaluated by way of comparative analysis of identified ICO project features with regard to each individual parameter.

Risk evaluation assists in making investment decisions by the user and development of investment strategy for interaction with the ICO project. Risk evaluation includes the comparison of risk analysis results with average risk criteria indicators of the NEIRONIX sandbox for determination of the need for follow-up actions:

- Inactivity;
- Consideration of possible risk treatment variants;
- Further analysis to understand the risk better;
- Support of existing control facilities;
- Revision of investment objectives.

Making investment decisions may be a multistage procedure, as broader context, objective and subjective consequences for external and internal stakeholders, and investor's personal position should be taken into consideration.

The key role in implementing the recommendations drawn with regard to making investment decision will be played by the IBM WATSON software. Proceeding from existing parameters and settings, as well as mathematical algorithms, this self-learning system makes calculations to find the acceptable combination of tools for treating the risk of losing investment funds by the user:

<table>
<thead>
<tr>
<th>Risk avoidance</th>
<th>It is recommended not to invest in ICO project</th>
<th>Project core is lower than average value by over 0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>It is recommended not to make investments in blockchain market</td>
<td>Risk level for ICO market system and sandbox is higher than 75%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk distribution</th>
<th>Forming pool of co-investors</th>
<th>Project score is equal to average sandbox value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Distribution of investment among several instruments in blockchain market</td>
<td>Score is within tolerable limits, yet there is a high level of uncertainty for ICO</td>
</tr>
<tr>
<td></td>
<td>Distribution of investments among several ICO projects</td>
<td>Score is within tolerable limits, yet there is a high level of uncertainty for ICO project</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Risk transfer</th>
<th>Risk hedging</th>
<th>In case of high level of financial risk</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Conclusion of insurance contract</td>
<td>In case of high level of SCAM</td>
</tr>
</tbody>
</table>

| Risk acceptance | Investment in project of $2,000 maximum | Risk-return ratio within normal limits in the range of $1,000 – $3,000. |

Table 3. AI SYSTEM structure cluster
Offering recommendations to the user is based on the key approach in making investment decision – analysis of investment risk indicator that is calculated as product of risk level multiplied by income and divided by risk management (risk treatment) costs:

\[
\text{Decision} = \frac{(\text{risk level} \times \text{income})}{\text{risk management costs}}
\]

The choice of the most acceptable risk treatment variant or variants implies comparing benefits expected from risk treatment with costs of risk treatment, as well as efforts expended in the process of risk management, and drawbacks of this process. For instance, estimated losses in case of risk occurrence are equal to all investment amount, say, $1,000, cost of investment protection insurance is $100, while the positive effect of risk management is estimated at $900. The investor should continuously compare the costs of risk treatment with the effect of risk management.

While using this or that risk treatment tool, the user should not forget about the universal formula of risk management efficiency: risk treatment costs / effect of risk management (should be > 0).
After completing all key stages of risk assessment, and in case the user makes the decision of investing in ICO project, NEIRONIX system informs the user about the condition of startup performance at different stages of its lifecycle. Put in differently, NEIRONIX system performs continuous risk management and monitoring of blockchain projects for the user’s benefit.

**Monitoring** – continuous inspection, control, critical supervision or determination of status for the purpose of identifying changes against the required or expected level.

**Risk control** – measures that modify (change) risk.

The objective of monitoring lies in assuring quality and efficiency of development, implementation and performance of service. Continuous monitoring and periodical review of the risk management process should constitute a planned part of risk management process with clearly defined responsibility being established with regard to it.

The monitoring and review are carried out at all stages of the process.

The results of monitoring and review form a part of activity dealing with general management of risks accumulated in the data storage for the purpose of further statistical processing and building unbiased analytics for the user.

The monitoring of ICO projects is performed with the help of key risk indicators (KRI) that:

- Point to possible exposure to risk in the future;
- Serve as early warning for unveiling a possible risk event that may prevent the investor from achieving his/her financial goals;
- Are future-oriented.

NEIRONIX keeps track of KRI on a continuous basis and informs the user about its condition and dynamics.

One and the same indicator may serve as both KRI and KPI (key performance indicator) (for instance, the indicator of current project liquidity.)

<table>
<thead>
<tr>
<th>Type</th>
<th>Definition</th>
<th>Used as</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator of cause-effect relation</td>
<td>Indicators bound to casual factors of potential risk event</td>
<td>Proactive indicators</td>
<td>Deferral deadlines for completion of individual operations; Violation of work phasing listed in Road Map</td>
</tr>
<tr>
<td>Indicator of effective control</td>
<td>Indicators that allow for tracking the efficiency of control facilities’ performance</td>
<td>Warning signal for investors</td>
<td>Temporary shutoff of block for monitoring of project implementation (if available) on the project’s site</td>
</tr>
</tbody>
</table>
The final ICO rating on NEIRONIX platform is the result of work performed by a complex of analytical systems. It includes all indicators that can have a direct or indirect influence on gaining investment benefit.

After completing all assessment stages and building a risk tree, NEIRONIX performs quantitative analysis as to the number of awarded points taking into account its influence on the result. On the basis of risk analysis concept used, the system assigns to the ICO project a score that serves as its indicator of reliability. Taking into consideration the assessment results, NEIRONIX system calculates for the investor the quantitative risk level indicator in the form of a score (from 0 to 100 points, where 0 stands for a heightened risk level, while 100 – for a high reliability of the project). The resulting value is displayed in the form of rating on the NEIRONIX platform.