A decentralized Protocol for crowd sourced advice on financial products, instruments and services.

(ENGLISH)

Whitepaper v1.0

Florian Koegl
FINNOQ GmbH
Linz, Austria
florian.koegl@finnoq.com

Stefan Thallner
FINNOQ GmbH
Linz, Austria
stefan.thallner@finnoq.com

Georg Felber
FINNOQ GmbH
Linz, Austria
georg.felber@finnoq.com

KEYWORDS

finance, blockchain, protocol, crowdsourced, advice, swarm intelligence

ABSTRACT

Opinions in the finance industry are mainly steered by central organizations and therefore have the power to influence entire markets. For this reason, Finnoq is developing an Open Source Protocol for collective opinion formation in the finance industry, drawing upon the wisdom of the crowd. The “Finnoq Core” is the basis layer of this Open Source Protocol and is used for community-based reconciliation. Consequently, applications for collective ratings regarding different financial products can be developed. On top of the basis layer (Finnoq Core) there is the “Service Layer”, it enables developers to integrate additionally needed modules (e.g. rating algorithms), which can be used by applications within a modularly-constructed system. Finnoq thus provides a protocol for forgery-proof opinions and sound advice from a global community. Due to the possibility of collective and decentralised opinion formation, it will no longer be necessary to rely on the perspective of a single organisation or individual.

Contents

1 PROBLEMS AND CHALLENGES IN THE FINANCE INDUSTRY

Currently markets can be controlled and manipulated by publications, evaluations and opinions of influential individuals and organizations, such as rating agencies (e.g. Standard & Poor's, Moody's, etc.) and banks (e.g. JP Morgan, Goldman Sachs, etc.). Through such enormously powerful instruments, decisions of single participants as well as market trends can be steered and manipulated, especially within the finance industry.

1.1 Subjectivity

In general, opinions are subjective and reflect the personal view of individuals toward a perceived reality. Precisely for this reason it can be quite dangerous if one must rely on the opinions of a single person or organization. Even if we are able to accumulate a broad variety of opinions (e.g. in large-scale surveys), the reliance on opinions remains an issue which cannot be avoided. Since many subject groups do not give truthful answers, due to either lacking or partially wrong incentives, the overall result shown is distorted in numerous studies. On top of that, intentionally-wrong statements do not lead to any negative consequences for the voter or respondent. Hence, the difficulty in generating objective opinions, serving as basis for decision-making, becomes increasingly challenging.

1.2 Wrong Incentive Models

Poorly composited incentives for fostering objective opinions may be exacerbating problems. Especially in connection to sales, opinions are often biased due to internally-determined financial incentives, making independent recommendations always at least partially subjective. As objectivity is often minimally rewarded, subjective content is monetized through various platforms; inherent business models consisting of inside key performance indicators and marketing efforts prioritize subjectivity over objectivity in the realm of rendering advice.

1.3 Result

Such problems represent the enormous demand for change on the basis of collective decision-making in the finance industry. On the one hand, individual organizations possess too much power and can quickly influence large parts of the market. On the other hand, market players cannot incorporate their knowledge in a profitable way. As a result, a distorted opinion in favor of powerful market players regarding different products, businesses, topics, etc. in the area of finance is established.

2 FINNOQ SOLUTION

We are convinced that a decentrally-organized protocol for opinions represents the solution to the aforementioned problems. By establishing the community as a driving force, we set up a process of how opinions are formed and decisions are made in an entirely different way. This is accomplished by not allowing the opinion of a single organisation to dominate, but by transferring the responsibility of opinion formation to a globalized and interdependent community. By doing so, the wisdom of the crowd can be relied upon. The entire incentive model is shaped in a way which allows every community member to make the best possible decision. To safeguard this, concepts underpinned by game theory such as rules are applied. Some of the upcoming parameters are not yet entirely defined, due to a high level of complexity and the current development stage, and will be adjusted after an extensive test phase. The basis of the entire Protocol is built on the model of "swarm intelligence" [15].

2.1 Swarm Intelligence

The term "swarm intelligence" mainly means through the many good decisions of individuals, a collective wisdom of the mass is created. This was demonstrated through an experiment undertaken at ETH Zurich, under the guidance of university professors and 144 participating students. In order to deliver good answers, students were incentivized with centrally-distributed money. The collective wisdom was tested and considered in two different ways. After a first self-estimation, a group of students learned about the average of an original student group who were asked the same question. The second half of the group was already provided with the estimated values of all other participants even before their self-estimation. It became apparent that in nearly all questions the initially given answers were on average the best ones. The more students knew about the estimates of the other study participants, the impact of swarm intelligence became diminished. Summarized, the collective mass makes better decisions than an individual. People giving estimations should therefore be unaware of which answers were given by others to achieve a more sound collective opinion [15]. Finnoq builds on this approach of swarm intelligence by combining subjective opinions to be transformed into a collective statement. Single queries do not learn about how other participants voted - whereby Finnoq exploits the total potential of the swarm intelligence.

2.2 Finnoq Core

The Finnoq Core is the centerpiece of the Protocol - an Open Source Protocol for collective advice in the finance industry. The Protocol is blockchain agnostically-constructed to be used basically on each Smart Contract Platform (ETH, NEO, EOS, etc.). The Finnoq Core represents the basis layer for different applicants, aimed toward crowd-based reconciliations regarding diverse finance products. In the Service Layer (e.g. rating algorithms, voting parameters, etc.), integration from developers of different modules can take place. Applications can integrate these modules easily.

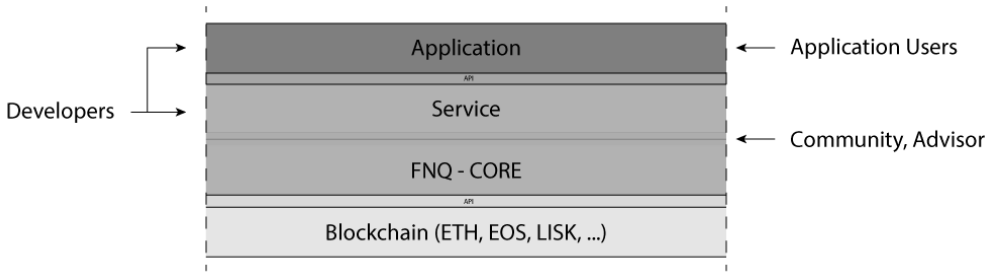

Figure 1: Layers and stakeholders

2.2.1 Role of Advisor

Advisors are those stakeholders that answer questions in the Finnoq core, execute reconciliations and therefore incorporate their knowledge. They represent the core of the Finnoq Core.

Definition 2.1 *(Advisor).*

$$A := \text{set of all Advisors}$$

$$a_i := \text{one single Advisor}$$

$$A = \{a_i | i \in \mathbb{N}\}$$

$$|A| = n \qquad \text{number of all Advisors}$$

Basically, everyone can become an Advisor. Prerequisites are that a certain number of FNQ Tokens are locked in a Stake Contract proving that Whitelisting was executed. Advisors have the possibility to answer available questions and participate in votes. Initially, experts have access to the Protocol via a Web3 [11] Interface (Metamask) [5]. Everybody self-administers this access with one's Private Key. For active participation in the Finnoq Core, Advisors are rewarded with remuneration. The amount of the Rewards is decided on the basis of a Credibility Score (c_i) and the number of locked FNQ Tokens (f_i). Generally applicable: the majority counts. This means that the more often an Advisor coincides with the majority by voting, the higher his/her Reward (see Voting).

2.2.2 Credibility Score

The Credibility Score (c_i) defines how often an Advisor (a_i) was "correct" (part of the majority). In case of a "not correct" decision (part of the minority) the Credibility Score decreases. Corresponding with the Credibility Score, the power of voice increases in votes. The level of power of voice does not affect the number of required minimum votes, which are selected by the user of the Finnoq Core in a voting process and is limited to a maximum of three ($3x$, three times). The level of Rewards for Advisors is dependent on an Advisor's Credibility Score. Every Advisor starts initially with a start bonus of the Credibility Score, an initial value of $c_i = x$ (in order not to lose the deposited FNQ Stake right away). With every "correct" vote the score is increased accordingly (for majority votes e.g. with ($c_i = c_i + 1$)). In case of having made a "not correct" decision, it is decreased twice as much, e.g. with ($c_i = c_i - 2$) in case of two answer options. The

decrease in the score by the factor of 2 should make sure that only those users participate in votes, who are certain about their answer. In general, the Credibility Score is decreased by the means of the answer options when giving "not correct" votes. In case of two answer options this means: -2; in case of 3, -1; in case of 4: -0.66; in case of 5, -0.5, etc. Thereby it is guaranteed that die chances/the risk rate stays the same in case of increased answer choices for a question. When votes are listed within a ranking order, the Credibility Score is adjusted dynamically. When more answer options are evaluated according to a ranking list, the Credibility Score is adjusted by factoring in the ranking order.

Definition 2.2 *(Credibility Score).*

$$c_i \coloneqq \text{the Credibility Score of an Advisor } (a_i)$$

$$c_i(t) \coloneqq \text{the Credibility Score of an Advisor } (a_i) \text{ at the point in time t}$$

Definition 2.3 *(Voting result (Majority Vote)).*

$$v_r \coloneqq \text{result of the voting}$$

$$v_r = \begin{cases} v_r = 0, & \text{when } s_i \text{ is part of the minority of the voting} \\ v_r = 1, & \text{when } s_i \text{ is part of the majority of the voting} \\ v_r = -1, & \text{when there is no majority existing or a quorum not reached} \end{cases}$$

Definition 2.4 *(Example: Adjustment of the Credibility Score in Majority Voting).*

$$g(c_i(t), v_r) = \begin{cases} c_i+ = 1, & \text{when } v_r = 1 \\ c_i- = 2, & \text{when } v_r = 0 \\ c_i = c_i, & \text{when } v_r = \text{-}1 \end{cases}$$

2.2.3 FNQ Stakeing Function

FNQ Tokens need to be locked for a free definable time frame, in order for the token holder to be able to participate in votes and hence be eligible for Rewards. Here however a minimum time needs to be taken into consideration. The reason for this is the reduction of speculations and sustainable assurance of good decisions deriving from the stakeholders. The longer the FNQ Tokens are locked in a Stake Contract, the higher is the amount of Rewards. In the event of a premature dissolution of the Stake Contract, a part of the Stakes of the corresponding Stakeholder is retained by Finnoq; in other words, the amount to be rewarded for the original time period is not distributed in full, but rather in correspondence with the time for which the contract was staked.Further, if the community member staking a contract seeks to extend the duration of the contract, then there will be additional rewards to be determined. In order to prevent bad behavior of Advisors, retainment of part of the Stake is established by Finnoq when there is a negative Credibility Score of an Advisor. Retained FNQ Tokens are distributed in the upcoming Reward payout to all other active stakeholders.

Definition 2.5 *(FNQ Token).*

$$C \coloneqq \text{number of all FNQ Tokens}$$

$$c_i \coloneqq \text{number of the Tokens of one FNQ Holder}$$

$$c_i(t) \coloneqq \text{number of the Tokens of one FNQ Holder at the point in time } t$$

$$|C| = m \qquad \text{number of all FNQ Tokens}$$

$$m = \sum_{i=0}^{|S|} c_i$$

Definition 2.6 *(FNQ Stake).*

$$F \coloneqq \text{number of all locked FNQ Tokens}$$

$$F_t \coloneqq \text{number of all locked FNQ Tokens at point in time } t$$

$$F, F_t \subseteq C$$

$$f_i \coloneqq \text{number of locked FNQ Tokens of one Advisor } (a_i)$$

$$f_i(t) \coloneqq \text{number of locked FNQ Tokens of one Advisor } (a_i) \text{ at point in time } t$$

$$|F| = k \quad \text{number of all locked Tokens}$$

$$k = \sum_{i=0}^{|S|} f_i$$

$$|F_t| = j \quad \text{number of all locked Tokens at the point in time } t$$

$$j = \sum_{i=0}^{|S|} f_i(t)$$

$$|F_t| \leq |F| \equiv j \leq k$$

2.2.4 Whitelisting – Process

One factor of major importance is represented by the "Whitelisting" of an Advisor. Every FNQ Holder who wants to be part of the Advisor community needs to go through a Whitelisting Process, which is executed by drawing on the means of a KYC procedure (verification of the identity). This procedure serves first and foremost to prevent multiple identities and in further consequence, that one identity cannot have more addresses in order to participate multiple times in votes. We are of the opinion that a Plutocracy (the more Tokens, the more voting power) is not suitable for the Finnoq Protocol. After the point in time where the FNQ Holder finishes the KYC procedure and transfers his FNQ Tokens in a Stake Contract, he is allowed to participate in votes as Advisor. This data is decentrally-stored on IPFS, while the hash as proof is written on the blockchain.

2.3 Decentralized Governance

All stakeholders in the Finnoq Core can be part of the Governance process. Every FNQ Holder, who has locked a minimum number of FNQ Tokens, can create Proposals (suggestions for further development of the Protocol). It is voted on the following:

- Voting on the intake of modules in the Service Layer (Whitelisting)
- Voting of disputes / applications (Blacklisting)
- Voting on new Protocol features (YES/NO)

Numerous processes in connection with Black- or Whitelisting are community-based and are decided by the FNQ stakeholder (FNQ Holder, who locked the FNQ Tokens). Additionally, a certain minimum number of participants needs to participate in the voting. In case of not reaching the number of minimum votes, the proposal is rejected. However, after a certain time period, it can be voted on again.

2.4 User Controlled Data

It is the aim for all of the data created through the Protocol (Voting results, Credibility Score of the participants, Whitelisting process,...) to be decentralized and cryptographically encrypted. The hash of the data is subsequently written as proof on the blockchain, in order to guarantee both transparency and simultaneous anonymity. In the future it will be possible that every user at his or her own discretion has the option to monetize the created data and to receive an according Reward for doing so. Via an interface, a user can select the offered desired data and pay FNQ Tokens to the Holder, in order to have the data decrypted. The payable FNQ Tokens are subsequently distributed to the respective users. So, every Advisor can profit from his work in the long run.

2.5 Blockchain

The blockchain serves as basis for the entire protocol, and is necessary in order to create a self-regulating, free ecosystem that is shaped by the Finnoq Core as fairly and securely as possible. The main functions of the blockchain are: safe reproduction of FNQ Stake Contracts and creation of transparent and forgery-proof votes (through Smart Contracts). Additionally, the blockchain serves as a basis for decentralized governance where all changes in the Protocol can be made. The Finnoq Core supports basically every Smart Contract Platform (Ethereum [10], EOS [4],Lisk [1],NEO [17] etc.). Initially the Finnoq Core will use the Ethereum blockchain.

2.6 Service Layer

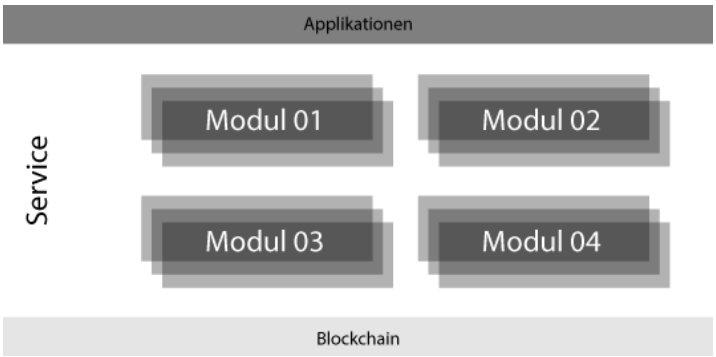

Figure 2: Modules in the Service Layer

The Service Layer provides modules, which have access to the Core of Finnoq and which can be used via API by different applications from a myriad of developers. Modules represent logic blocks and therefore provide the possibility to implement diverse algorithms for evaluating questions and standardized templates for various uses (e.g. insurances, etc.). All functions within a module are processed in the Finnoq Core. Concrete application cases for a possible module could be the following examples:

- Module 1: The analysis of a question is initially possible by the means of vote numbers (majority).
- Module 2: In the future it will also be possible to execute votes via ranking list. Advisors therefore can evaluate the answers according to their correctness.
- Module 3: A template for rating of a Crypto asset. A respective module can be released, which enables the rating to take place. Due to the fact that modules can be used by multiple Apps and therefore represent an extended basis functionality of the Finnoq Core, they have to be accepted by the FNQ stakeholder (Whitelisting). This means that for the inclusion of modules a voting is done within the Governance functionality.

Modules for the Service Layer can be divided in three groups:

General modules and modules for parameter definition and assessment

- General
  - Ways of encrypting data (see 2.4 User controlled data)
  - Reward models for various kinds of votes
  - Adjustment of the Credibility Score in case of different voting types
- General parameter definitions
  - Type of question (Fixed Choice, Open Questions, Ranking List, etc.)
  - Definition of the questioning (individual text)
  - Type of voting (Ranking, Award for Points, Single Choice, etc.)
  - Advisors with minimum credibility
  - Time period of the voting
  - Advisors with a certain number of locked FNQ Tokens
  - Definition of the target group and categories (e.g. insurance, etc.)
  - Minimum or maximum number of Advisors
  - Limitation of the answer options (Open Questions)
- Analysis Algorithms
  - Majority (51%, 2/3, etc.)
  - Ranking (ELO [18] , GLICKO, GLICKO2 [6], etc.)

2.6.1 Developers for Modules

In the Service Layer, developers can release modules that have access to the Finnoq Core, and thereby provide extended functionalities for App developers. In order to make sure that the Core is compatible with new modules and that it does not incorporate any malicious code, modules have to be verified and confirmed by FNQ Holders prior to their inclusion (Whitelisting). Only after FNQ Holders vote in favor of a module it will be incorporated into the Service Layer. Subsequently, the developers of modules will receive corresponding Rewards from the Applications.

2.7 Apps on Finnoq Core

The development of Applications on the Finnoq Core is basically possible without any restrictions. Only for the release or the access of Applications to the Protocol will developers have to lock FNQ Tokens and integrate all relevant modules. In doing so this ensures the interaction between Application and Core. Alternatively, the Finnoq Core can also be integrated into already existing platforms. The necessity of locking FNQ Tokens when releasing Applications serves primarily as protection against spam and to prevent harmful Applications to the ecosystem. On top of this there is the possibility to report Apps

and, in further consequence, lock such Apps and force the developer forfeit FNQ Stakes (Blacklisting), as decided by the FNQ Holders while voting.

Possible Use Cases for Apps can be:

- Ratings or assessment of diverse finance products
- Crowd-based financial consultation
- Crowdsourced trading algorithms
- Integration into existing platforms (e.g. ICO Ratings, etc.)
- etc.

2.7.1 Procedure of votes in an App – "Opinion Creation"

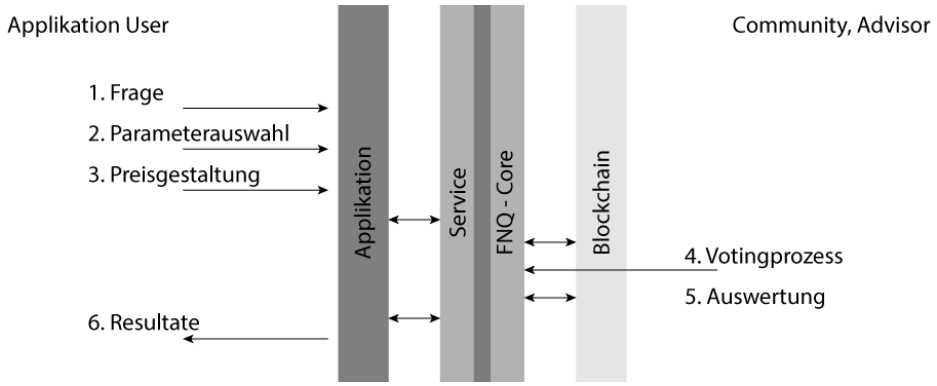

Figure 3: Procedure of votes

In order to be able to access the Finnoq Core, the user of an App first has to define which kind of voting or question is needed. Then, the desired parameters (number of participants, minimum Credibility Score, time duration, etc.) have to be selected and how much one is willing to pay (FNQ) for the voting. This procedure is called "Opinion Creation". The modules available for a user is defined by the used App, because not all modules are relevant for every App. The sum of FNQ a user is willing to pay for a vote is safely locked in a Smart Contract until the end of the voting. At the end of the voting, the reward is distributed to the participating Advisor. Those Advisors, having already participated in the voting before the minimum number of participants was reached, receive a higher reward.

In general, it is distinguished between two types of questions:

- **Open Question:**

  The user asks an individual question and defines the number of possible answer options, which then pases to the voting and verification steps. Every Advisor can create answer options (maximum 1 answer per voting). As soon as the number of desired answer options is reached, the selected Advisors (depending on the ranking algorithm of an App) vote on the answer options. A respective Reward is only given to the Advisor whose answer option in the voting is considered "correct" as part of the majority. Thereby, rewards for the creation of an answer option are higher than those rewards for voting on such options. Those answer options, which were judged "not correct" in the voting process, reduce the credibility of the respective user.

  The following points serve as spam protection (e.g. when a user has access to more accounts and automatically creates the maximum number of answer options):

  – the minimum stake FNQ per account (in case of negative credibility it gets lost)
  – the transaction costs per vote (gas costs) [20]
  – the Whitelisting process

  If deemed required, a bidder procedure could be implemented. In the case of exceeding a designated amount of answers, Advisors can add an additional answer after the predetermined time by providing a certain amount of their additional FNQ Stake as deposit. Thereby, spam will additionally be prevented.

- **Fixed Choice:**

  The user asks a question with predefined answer options, which are directly voted on, (e.g. rating of finance products ⟶ AAA, AA, A, BBB, etc.) [13, 14].

As part of the "Opinion Creation" the user can select multiple parameters, which are available as modules in the Service Layer. These are depending on the respective App, as pre-defined (see 2.6 for more on Modules in the Service Layer).

After the parameter selection, the user states how many FNQ Tokens to pay as Reward. Advisors will only participate in votes if they are paid accordingly or they receive a Reward according to the parameters. Thereby the laws of the game theory come into action. The Reward per voting can be freely defined. Should there be too low a number of FNQ Tokens for the desired request offered, the voting with higher probabilities will not be answered. Only competitive offers will be edited by an Advisor, since the market is determined by supply and demand. Thereby, price equilibrium is established. Due to the fact that the determination of a fixed price is not possible in practice, the Finnoq Protocol provides a current price suggestion by the means of selected parameters and current prices within the system.

Every App developer can fixate how many FNQ Tokens he wants to receive per voting. However, he should take into consideration that a too high price might result in detrimental outcomes. The share of a reward for protocol developers (Finnoq Team) and module developers is fixed and predetermined. In the case of a selected Reward too low, which leads to no result or too few participants (> minimum), a part of the Stake is kept and distributed to the Advisors who have already participated. After fixing the Reward, voting takes place in the Finnoq Core by the selected Advisors. Note: Target groups can only be defined after a test phase, since it becomes only then apparent which Advisor votes correctly in which area.

Voting

During a voting process, the selected Advisory group receives the question with pre-defined parameters as well as the possible and suggested Reward within the Finnoq Core. While voting is ongoing, no Advisor can see how other Advisor voted (secret vote). After the voting process is complete, the result is published. The entire voting process and result are executed pseudonymously. Depending on which type of ranking or execution in the respective module, rankings can be analyzed differently.

- **Majority Vote**

  The Advisor can only opt for one answer. Every Advisor who voted for the answer of the majority gets a Reward and an increased Credibility Score. The other Advisors who did not vote with the majority do not get a Reward and their Credibility Score gets decreased as such. This is especially for Apps and votes where a low number of answer options would be suitable, e.g. rating of a finance product.

- **Ranking Votes**

  Awards for points in alignment with the answer options. The answers can be determined according to importance and correctness. For instance, among the 10 answer options, 10 points in sum may be given. Apart from the assessment with classic key figures, such as the average or median, the assessment can also be made via an average ranking. In this case, the average ranking per answer option is calculated in order to determine which answer option was ultimately favored. In case of, for instance, three assessment possibilities (A, B, C) as options, which are ranked (B, C, A), the following weights result: 3*A,2*C, 1*B. Random assessment possibilities can be implemented in the form of modules.

  In this model, the rewards are distributed to the advisors according to their rank; further, the credibility score is adjusted accordingly. This is suitable for reconciliations with more or many answer options to choose from. After successful completion of the voting process, the FNQ Stake of the user gets automatically distributed to the eligible protocol stakeholders, where the user gets the final result.

2.8 Rating of Tokenized Assets App

As a first proposed App on the Finnoq Core, the Finnoq development team itself intends to develop a Rating App for "Tokenized Assets". Tokenized Assets are values represented on a blockchain. The problems, which are solved by doing so are:

- FUD (Fear, Uncertainty and Doubt) in the crypto area [19]
- No transparent ratings of single crypto assets
- Many scams in the case of crypto assets

Thereby, users (usually blockchain companies) can allow single crypto assets to be assessed, while additionally executing opinion research regarding single assets within crypto markets. This information would be freely available as a resource for everybody. The objective in launching such an Application is to generate forgery-proof assessments and views regarding diverse crypto assets, aimed primarily at enabling transparency in a constant information flood. This is an independent project from the Finnoq Protocol, illustrating a first Use Case.

2.8.1 Cryptocurrency Exchange

In the App "Rating of Tokenized Assets" as well as in the Protocol, a "fiat money to cryptocurrency" exchange will be available, in order to ease access to the crypto market and FNQ Tokens. In the future it will be possible to buy BTC, ETH and FNQ with fiat money. This service is performed by [3], an Austrian company.

2.9 Rewards

Rewards are a vital crypto-economic instrument, in order to create the right incentives for all stakeholders and thereby, to reach the best possible collective decision. The pay out of the Rewards is executed once per month (this can however be adjusted with decentralized governance (see point 2.3). Rewards exist in every voting process and are financed by the App's users. Additionally, the FNQ Stakes of the stakeholders who behaved wrongly are added. These FNQ Stakes are then distributed to all eligible FNQ stakeholders. Due to currently exorbitant transaction costs, the Rewards are paid out only starting from a minimum amount. To encapsulate the process, the received Rewards of the stakeholders are saved in a Smart Contract (Reward Pool).

However, Rewards in this case are only then transferred as soon as the minimum amount of FNQ Tokens could be reached. As long as the Tokens are in the Pool and not transferred to the FNQ Holder, such Tokens will also be ineligible for future votes and for the calculation of the Rewards.

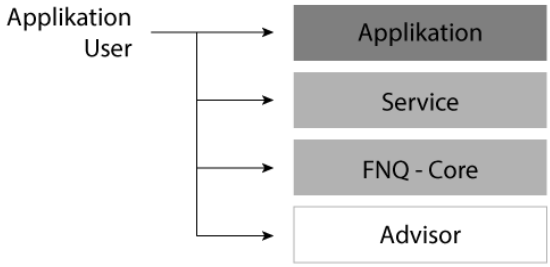

Figure 4: Rewards for stakeholders

Rewards are distributed to the following stakeholders:

App developer

App developer can self-define their Reward per voting process (when creating the App), due to the tremendous number of Use Cases in which the Finnoq Core can be used.

Note: The fees for using an App, which are determined by the developer, are always additional to all other fees.

Module developer

Developers, who successfully integrate modules in the Service Layer, receive a fixed percentage of the would-be distributed Reward for every usage of the module via the App or App user. Hence the more often a module is used, the higher is the Reward for the developer.

Note: Fees for the module developer are subtracted from the fees of the FNQ Core. E.g. when 1% FNQ fee, the module receives 0.5% and the 0.5% remainder to the Finnoq Protocol.

Protocol developer

The Finnoq Team is the Protocol developer. The Finnoq Team, like the module developer, receives a fixed percentage of the Reward per reconciliation.

Note: The Finnoq Protocol gets in general approximately a 1% fee on all transactions (asking a question, price).

Advisor

For determining the quantity of a Reward for the Advisor, the Credibility Score (ci) as well as the number of locked FNQ Tokens used at the point in time $f_i(t)$ voting took place.

Note: The paid Reward, minus the accumulation of App, Module, and Finnoq Protocol fees of the asking one is paid out to Advisors (who provided “correct” answers or voted “correctly”), all corresponding to the number of locked FNQ Tokens and the Credibility Score.

Gamification

Also, there will be a Gamification process with a high-scorers list. The best active FNQ stakeholders will be rewarded with bonus incentives.

2.10 FNQ Token Model

The FNQ Tokens is the core of Finnoq. FNQ is an ERC 20 Tokens and runs on the Ethereum blockchain. It makes sure that the platform works crypto-economically. Voting procedures as well as Rewards are depicted in FNQ. The FNQ Tokens connect all stakeholders to a self-regulating ecosystem. All FNQ Tokens are produced and distributed at the Initial Coin Offering (ICO). The number of FNQ cannot be changed afterwards.
The FNQ Tokens are used in the Protocol for the following purposes:

Work

The FNQ Tokens authorize executing work within the Finnoq Core. In order to be part of the network and to get Rewards, all stakeholders (Advisors and App developers) have to lock FNQ in a Smart Contract. Thereby, more and more FNQ are removed from the market when the usage of the Finnoq Protocol is increasing. This phenomenon causes a smaller supply and the demand of each stakeholder, necessitating FNQ increases.

Governance

All decisions and changes in the Finnoq Core are made by the FNQ Holders. A prerequisite for this is that FNQ Tokens are locked in a Stake Contract for a certain time. Consequently, everyone has the possibility to become part of the Governance process. The FNQ thus represents and doubles as a Governance authorization.

Payment

The FNQ Token serves as means of value-transfer within the Finnoq ecosystem. All Rewards are paid and distributed in FNQ. Thereby, the liquidity is increased because of higher Token velocity (defined as the number of how often a Tokens changes its owner), enabling effective trade of the available FNQ Tokens (circulating supply).

3 ROADMAP

February 2017 – Foundation of FINNOQ GmbH

The company FINNOQ was founded by Florian Kögl and Georg Felber in Linz, Austria under the legal form GmbH (limited liability company).

March 2017 – Admission to the Tech2b Incubator Program

Finnoq was ranked among the Top 15 start-ups among all submissions. The Tech2b Center is one the leading incubators in Austria.

May 2017 – Seed Round financing from the OÖ Gründerfonds

Finnoq received a Seed financing from the OÖ Gründerfonds.

September 2017 – Admission to Business2Excellence

Finnoq was selected among 5 companies for the Business2Excellence program in October.

September 2017 - Launch of the Finnoq Consulting Platform

On this platform users can inform themselves about different financial topics and get in contact with finance consultants via modern communication tools. It is accessible under advisor.finnoq.com.

November 2017 – Conceptualization of the Finnoq Protocol

Drawing on our experience gained from the consulting platform, the concept and first realization steps for the Finnoq Core, which should make the advisory process decentral, were done.

Q2 2018 – Re-Design

Logo and Corporate Design were re-designed.

Milestone 1 Q1/2019

- Finnoq Core live at Testnet
- Whitelisting process
- Fiat to Crypto Exchange

Milestone 2 Q2/2019

- Finnoq Core live Mainnet
- First steps in the Service Layer

- Start Ecosystem Fund
- Establish a foundation for the Finnoq Protocol

Milestone 3 Q3/2019

- Release of the App “Rating of Tokenized Assets” on the Finnoq Core.
- Data is saved centrally and can be monetized.

4 RESULT AND FUTURE OUTLOOK

Due to our personal experience in the area of finance, we are of the firm conviction that opinions, and especially advice, can be equally depicted and decentralized. It is precisely from here that Finnoq Core starts; we declared our goal to set up decisions in the finance industry in an entirely new way, hence building on the wisdom and dynamics of the crowd. It is our goal that Finnoq Core operates in other markets in the future and due to its success, that we as a global community would make better decisions. We are not co-creating a market: we define it anew.

5 ACKNOWLEDGEMENT

The greatest thank you goes to the blockchain community. Without such an impressive basis created in the last years, we would not work today on a new form of decision-making processes. We would like to express our profound appreciation and thank all who contributed to the creation of this document. For those who go unmentioned in this document, you effort in turning innovative ideas into realities is not forgotten. Of course, we would also like to thank our sponsors from zero hour, with the Tech2b Incubator leading the way. We opted to set up our headquarter in Linz,Austria for various reasons. One the one hand, there is an incredibly-engaged start-up and entrepreneurial scene in Linz. On the other hand, the region of Upper Austria (OÖ) strives to become a blockchain hotspot at international top level. It is our honor to support such an endeavour.

6 NOTICE

If you are not sure about joining into the Private Sale and following Token Generating Event („TGE“), please consult with professional advisors in the fields of legal, tax and financial.

7 LEGAL DISCLAIMER

This whitepaper („Whitepaper“) is provided by FINNOQ GmbH, a limited liability company incorporated under the laws of Austria, with its registered address at Hafenstraße 47-51, 4020 Linz, company registration number FN 467638d („FINNOQ“), for information only. The purpose of this Whitepaper is to present the open source protocol for collective advisory in the financial industry, especially on tokenized assets, named FINNOQ core based on the Ethereum Blockchain (the “FINNOQ Software”) and the ERC20-Standard FNQ tokens (the “FNQ tokens” or “FNQ”) to potential token holders in connection with the proposed TGE. This Whitepaper and the information stated herein is not legally binding. The information set forth below may not be exhaustive and does not imply any elements of a contractual relationship. Its sole purpose is to provide relevant and reasonable information to potential token holders in order for them to determine whether to undertake a thorough analysis of the company with the intent of acquiring FNQ tokens. Nothing in this Whitepaper shall be deemed to constitute a prospectus of any sort or a solicitation for investment, nor does it in any way pertain to an offering or a solicitation of an offer to buy any securities in any jurisdiction. Furthermore this Whitepaper does not constitute an offer of FNQ tokens nor an invitation for an offer to exchange any amount of Ether for FNQs. All relevant legal information is contained in the Token Purchase Agreement or the Token Exchange Agreements and their Annexes. This document is not composed in accordance with, and is not subject to, laws or regulations of any jurisdiction, which are designed to protect investors. The FNQ token is not a security, commodity, or any other kind of financial instrument and has not been registered under the Securities Act, the securities laws of any state of the United States or the securities laws of any other country, including the securities laws of any jurisdiction in which a potential token holder is a resident.

No offer of securities

FNQ tokens cannot be used for any purposes other than as provided in this Whitepaper, including but not limited to, any investment, speculative or other financial purposes. FNQ tokens confer no other rights in any form, including but not limited to any ownership, distribution (including, but not limited to, profit), redemption, liquidation, property (including all forms of intellectual property), or other financial or legal rights, other than those specifically set forth below. FNQ tokens confer no rights in the company and do not represent participation in the company. FNQ tokens represent functional utility. FNQ tokens are not securities. The user acknowledges, understands, and agrees that FNQ tokens are not securities and are not registered with any government entity as a security, and shall not be considered as such. The User

acknowledges, understands, and agrees that ownership of FNQ tokens does not grant the User the right to receive profits, income, or other payments or returns arising from the acquisition, holding, management or disposal of, the exercise of, the redemption of, or the expiry of, any right, interest, title or benefit in FINNOQ, the FINNOQ core, the FINNOQ Software, the FINNOQ Ecosystem or any other FINNOQ property, whole or in part. FNQ tokens are not official or legally binding investments of any kind.

Risks and uncertainties

The FINNOQ core and the FINNOQ Software is not yet developed and is subject to further changes, updates, and adjustments prior to its launch. Such changes may result in unexpected and unforeseen effects on its projected appeal to users, possibly due to the failure to meet users' preconceived expectations based on this Whitepaper, and hence, impact its success. For the foregoing or any other reason, the development and launch of the FINNOQ core, the FINNOQ Software and future business lines of FINNOQ may not be completed and there is no assurance that it will be launched at all. Further, should the costs, financial or otherwise, of complying with any newly implemented regulations exceed a certain threshold, bearing in mind the fact that it is difficult to predict how or whether governments or regulatory authorities may implement any changes to laws and regulations affecting future business lines, maintaining the FINNOQ core and the FINNOQ Software may no longer be commercially viable, and FINNOQ may opt to discontinue the development and operation of FINNOQ core and FINNOQ Software. In the case of unforeseen circumstances, the objectives stated in this document may be changed. Despite the fact that we intend to reach all goals described in this document, all parties involved in the purchase or exchange of FNQ tokens do so at their own risk. The funds raised in the TGE are exposed to risks of theft. FINNOQ will make every effort to ensure that the funds will be securely held in blockchain wallets. Notwithstanding such security measures, there is no assurance that there will be no theft of the cryptocurrencies as a result of hacks, sophisticated cyber-attacks, distributed denials of service or errors, in the smart contract(s) on the Ethereum or any other blockchain, or otherwise. In such event, even if the TGE is completed, FINNOQ may not be able to receive the cryptocurrencies raised and FINNOQ may not be able to use such funds for the development of the FINNOQ core and the FINNOQ Software. In such case, the launch of the FINNOQ core and the FINNOQ Software might be temporarily or permanently curtailed.

Eligibility

The FINNOQ Website, the FINNOQ core, the FINNOQ Software and the FNQ tokens are not offered for use to natural and legal persons, having their residence or their seat of incorporation in the following countries: (A) THE UNITED STATES OF AMERICA; (B) PEOPLE'S REPUBLIC OF CHINA; (C) REPUBLIC OF KOREA; (D) ICELAND; (E) BOLIVIA; (F) BANGLADESH; (G) EQUADOR; (H) JAPAN; (I) KYRGIZ REPUBLIC; (J) NORTH KOREA; (K) IRAN; (L) IRAQ; (M) LIBYA; (N) SYRIA; (O) SOUTH SUDAN AND (P) CUBA ("Restricted Areas"). Natural and legal persons with their residence or seat of incorporation

from the Restricted Areas shall not use the FINNOQ Website, the FINNOQ core, the FINNOQ Software and the FNQ tokens. FINNOQ reserves the right to decide in its own discretion to adopt reasonable organisational and technical measures to assure that the FINNOQ Website, the FINNOQ core, the FINNOQ Software and FNQ tokens are not available to persons from Restricted Areas. If you are registering to use the FINNOQ core, the FINNOQ Software and FNQ tokens on behalf of a legal entity, you represent and warrant that (i) such legal entity is duly organized and validly existing under the applicable laws of the jurisdiction of its organization, (ii) you are duly authorized by such legal entity to act on its behalf, (iii) neither you nor the entity you are representing are listed on any of the sanctions lists published and maintained by the United Nations, European Union, any EU country, any OECD country, UK Treasury and US Office of Foreign Assets Control (OFAC), (iv) you have a deep understanding of the functionality, usage, storage of cryptographic tokens, Smart Contracts, and blockchain-based software, (v) the legal entity you are representing has its seat of incorporation outside of any Restricted Area and (vi) you have carefully reviewed the content of this document and have understood and agreed with these terms as well as the Terms and Conditions of FNQ tokens. If you are registering to use the FINNOQ core, the FINNOQ Software and FNQ tokens on your own behalf, you represent and warrant that you (i) are of legal age to form a binding contract, (ii) have full power and authority to accept these Terms, (iii) are not listed on any of the sanctions lists published and maintained by the United Nations, European Union, any EU country, any OECD country, UK Treasury and US Office of Foreign Assets Control (OFAC), (iv) have a deep understanding of the functionality, usage, storage of cryptographic tokens, Smart Contracts, and blockchain-based software, (v) have a deep understanding of the functionality, usage, storage of cryptographic tokens, Smart Contracts, and blockchain- based software, (vi) your residence is outside of any Restricted Area and (vii) you have carefully reviewed the content of this document and have understood and agreed with these terms as well as the Terms and Conditions of FNQ tokens.

No Cancellation and No Refund

All FNQ token orders are deemed firm and final. The FNQ token holder acknowledges that they are fully aware that they will not be entitled to claim any full or partial reimbursement under any circumstances whatsoever. As the sale or exchange of the proposed FNQ tokens is strictly reserved for experienced professional clientele, the FNQ token holder may not claim any right of return against FINNOQ.

No guarantee on trading

FINNOQ will use reasonable endeavours to seek the approval for availability of the FNQ tokens for trading on one ore more cryptocurrency exchanges. Furthermore, even if such approval is granted by a cryptocurrency exchange, there is no assurance that an active or liquid trading market for the FNQ tokens will develop, or if developed, will be sustained after the FNQ tokens have been made available for trading on such cryptocurrency exchange. FINNOQ is not responsible for, nor does it pursue, the circulation and

trading of FNQ tokens on the market. Trading of FNQ tokens will merely depend on the consensus on its value between the relevant market participants.

Note on forward-looking statements

All claims and statements made in this Whitepaper, FINNOQ Websites, press releases made by FINNOQ, also any oral statements made by FINNOQ team members or agents acting on behalf of FINNOQ that are not an accomplished fact may represent so called forward-looking statements or information. Forward-looking statements are based on current estimates and assumptions that FINNOQ makes to the best of its present knowledge. It is a statement that does not relate to historical facts and events. Such forward-looking statements or information concern known and unknown risks and uncertainties, which may cause actual developments or results to differ materially from the estimates or the results implied or expressed in such forward-looking statements. Forward-looking statements are identified by the use of terms and phrases such as „anticipate“, „believe“, „could“, „estimate“, „expect“, „intend“, „plan“, „predict“, „project“, „will“ and similar terms, including references and assumptions. This applies, in particular, to statements in this Whitepaper containing information on future developments of FINNOQ core, FINNOQ Software and FNQ tokens, plans and expectations regarding the acceptance of the FNQs in the market or its growth of value. These forward-looking statements are not yet accomplished facts and FINNOQ does not take responsibility and cannot guarantee that the future results will correspond with above mentioned forward-looking statements. These forward-looking statements are also provided as-is and FINNOQ takes no responsibility for updating these forward-looking statements, should any information relevant to the pertaining forward-looking statements become available in the future. No information contained in this white paper should be considered as a promise, representation of commitment or undertaking as to the future performance of the FINNOQ core, the FINNOQ Software, FNQ tokens or any other component of the FINNOQ Ecosystem. This English-language Whitepaper is the primary official source of information about the FINNOQ core, the FINNOQ Software and the FINNOQ token. The information contained herein may be translated into other languages from time to time or may be used in the course of written or verbal communications with existing and prospective community members, partners, etc. In the course of a translation or communication like this, some of the information contained in this paper may be lost, corrupted or misrepresented. The accuracy of such alternative communications cannot be guaranteed. In the event of any conflicts or inconsistencies between such translations and communications and this official English-language Whitepaper, the provisions of the original English-language document shall prevail.

As of 10.05.2018.

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