White Paper

—

Development of an Industry-Ready Blockchain Solution

— qanplatform.com

powered by

centrum circle

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Company Data

Issuer:	**QANtum Global OÜ**	**Registration date:**	September, 2019
	Lõõtsa tn 5, 11415 Tallinn,		
	Estonia		
	European Union		

The company has no financial statement from a closed financial year.

For company registration documents please find the following attachments to the White Paper:

- Articles of Association
- Extract from the company register of Estonia (The extract of the register is also available at < https://ariregister.rik.ee/ >)

Team

Endre "Silur" Ábrahám
Cryptology Consultant

Levente "Razor" Szabó
Blockchain Developer

Máté "Rothens" Dávid
Blockchain Developer

Miklós "Garmine" Kozák
Blockchain Developer

Zoltán "Deusz" Lovas
Blockchain Developer

Blanka Bognár
Innovation Manager

Delegated Advisors
from Centrum Circle

Gergely Vesszős
Regulatory Advisor

Lórand Fóris
Management Advisor

Johann Polecsák
Technology Advisor

Gergő Szőke
Marketing Advisor

Viktória Hajdú
Project Management Advisor

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General Corporate Information and Articles of Association

1.1.1 General Corporate Information

The business name of the Company is QANtum Global OÜ. The Company was registered in the Estonian Commercial Register under the register code 14797500 The Company has been established and is currently operating under the laws of the Republic of Estonia in the form of a limited liability company and is established for an indefinite term.

1.1.2 Licenses

On the day of the issuing the White Paper, the Company owns two licenses:

*   activity license for financial services, providing services of exchanging a virtual currency against a fiat currency No FVR001189
*   activity license for the financial services, providing a virtual currency wallet services No FRK001074

1.1.3 Articles of Association

The Articles of Association of the Company was adopted on 5 September of 2019. The main terms of the Articles of Association of the Company are the following:

*   The amount of the share capital of the company is 2 500,00 EUR.
*   Upon increasing the share capital the shares of the private limited company shall be paid for in monetary contribution only.
*   One euro of each share of the private limited company shall give one vote at the shareholders' general meeting of the private limited company as well as in decision-making without convening the meeting;
*   Upon transfer of a share of the company: the other shareholders have the right of pre-emption if the share is transferred to any third person;
*   A share of the company may be pledged;
*   Company may issue, for a conditional increase of the share capital, bonds by a resolution of the shareholders, the holders of which have the right to convert their bonds to shares (convertible bond);
*   Each member of the management board has the right to represent the company in all legal acts unless a different entry is made in the commercial register. A corresponding resolution of the shareholders shall be adopted under the procedure prescribed for amending the articles of association;
*   The company shall have no supervisory board;
*   The financial year of the company is from 01.01 to 31.12.

1.2 Share Capital, Shares and Ownership Structure

1.2.1 Share Capital and Shares

The current registered capital of the Company is EUR 2 500,00 without making contribution which is divided into 2 500,00 ordinary shares of the Company (the Shares) with the nominal value of 1 EUR. The Shares are governed by the laws of the Republic of Estonia. The Shares are freely transferrable.

1.2.2 Shareholders of Company

As at the date of this White Paper, the Shareholders holding over 25% of all Shares in the Company are the following:

Name of Shareholder	Proportion
Thompson&Stein Corporate Services OÜ	100%

The founder of the Company is Thompson&Stein Corporate Services OÜ. The Company was registered in the Estonian Commercial Register under the register code 14795664. The Company has been established and is currently operating under the laws of the Republic of Estonia in the form of a limited liability company and is established for an indefinite term.

1.2.3 Rights of Shareholders

Introductory Remarks.

This Section "Rights of Shareholders" aims to provide rights of shareholders arising from Estonian law applicable in respect of the Shareholders of the Company. Right to Participate in Corporate Governance. The shareholders of a limited liability company are entitled to take part in the corporate governance of such company through the general meeting of shareholders, where they can exercise their powers to decide on certain important corporate matters, such as the amendment of the articles of association, the increase and decrease of the share capital, the approval of annual reports and the distribution of profit, the dissolution, merger, division or transformation of the company, and certain other matters. The general meeting of shareholders is the highest governing body of a limited liability company. The ordinary general meeting of shareholders must be held once a year pursuant to the procedure and at the time set forth by the law and the articles of association. The shareholders' meeting is qualified to pass resolutions if at least 51% of the votes determined by shares are represented at it. A resolution of the shareholders shall be adopted if 51% per cent of the votes of the participants in the shareholders' meeting or of all the votes in the case of deciding without convening the meeting is given in favor unless otherwise provided for by law or the Articles of Association.

Right to Information.

The shareholders of the company have the right to receive information on the activities of the company from the management board at the general meetings of shareholders. However, management board may refuse to give information if there is a reason to presume that this may cause significant damage to the interests of the company. In the event the management board refuses to give information, shareholders may require the general meeting of shareholders to decide on the legality of such refusal.

Right to Dividends.

All shareholders of the Company have the right to participate in the distribution of profit of the company and have the right to receive dividends proportionally to their shareholding in the company. Resolving the distribution of profit and the payment of dividends is in the competence of the general meeting of shareholders. The resolution of the distribution of profit and the payment of dividends is adopted on the basis of the approved annual report for the preceding financial year, whereas the management board is under the obligation to make a proposal for the distribution of profit and the payment of dividends in the annual report or in a separate document accompanying the annual report.

1.3 Management

1.3.1 Management Structure

In accordance with the Estonian law, the operational management of the Company depends on the Management Board. On the 5th of September 2019 the Management Board contains one member. The address of operations of the Management Board is the registered address of the Company - Harju maakond, Tallinn, Lasnamäe linnaosa, Lõõtsa tn 5, 11415.

1.3.2 Management Board

Role. The Management Board of the Company is responsible for the day-to-day management of the Company's operations, the representation of the Company and for organising the its accounting. Further, it is the obligation of the Management Board to draft the annual reports. The Company is represented by two Members of the Management Board. Each board member can represent the Company separately. The members of the Management Board held a liability with its personal assets. The liability is practically unlimited.

Members of Management Board. According to the Articles of Association, the Management Board comprises of one to five members. Currently the Management Board contains one member:
- Dr. Lorand Foris

1.3.3 Biographical notes about the member of the Management Board

Lorand FORIS
Lorand Foris (M 1977) is head of the management team at QANplatform.

As a lawyer and financial expert, he gained experience as a Corporate Finance at OTP Bank Ltd. and served in director and managing director positions in several companies in Germany, Poland, Malta, Estonia, and Hungary. Mr. Foris is also the Chief Legal Officer (CLO) at Centrum Circle.

1.3.4 Conflicts of Interests and Other Declarations

According to the knowledge of the Management, there are no known actual or potential conflicts of interest between the duties of any of the members of the Management Board of the Company, and their private interests or other duties.

According to the knowledge of the Management, none of the members has ever been convicted in a criminal offence or been a member of a governing body of a legal entity subject to bankruptcy or liquidation proceedings at the time of initiating the relevant proceedings. Furthermore, none of the persons referred to in this Section has ever been disqualified by a competent court from acting as a member of administrative, supervisory or management body or conducting affairs of a legal entity.

1.4 Financial Information

At present the Company does not own the financial statements. The Company was registered on 05 September 2019. On the day of the White Paper, the Company's financial situation is described in the table below:

	05.09.2019 — XX.XX.XXXX
Operating expenses	0 EUR
Income	0 EUR
Liabilities	0 EUR
Equity	2 500,00 EUR Called up share capital)

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Introduction:
Problem, Opportunity and Company Mission

> ❝ *The last 10 years has been a social experiment that justified the relevance and necessity of blockchains. Now it's time for industry-ready solutions.*
>
> Silur
> Mathematician, Ethereum contributor
> Chief Architect of QANplatform

2.1 Overview

Connecting business and blockchain technology requires a blockchain platform of a new generation.

We at QANplatform are building a quantum-proof, energy efficient and fast platform, that relies on a new protocol: the Proof-of-Randomness (PoR).

Where you can develop smart contracts in major programming languages.

Our framework provides, first in the world, a fully quantum-resistant stack of security.

Many believe that breakthrough comes when industries and mainstream economies will start using blockchain extensively. Industry and businesses will adopt concepts only when both security and transaction speed meet their requirements. In the near future, their existing business processes become more secure, faster and more efficient - with the new means of a new blockchain, that adequately rewards participating players.

As of 2019, over 95% of smart contracts is hosted on the Ethereum blockchain - a platform that is slow and fails in many cases. A new blockchain platform is needed if businesses want to fully realize the efficiency and systemic savings offered by blockchain.

Worldwide and mainstream adoption is yet to happen. Players of the transactions - node owners and smart contract developers - must be adequately paid for their efforts.

In the last 10 years we have seen a social and business experiment on a global scale to find out if there is a need for technologies like blockchain. These technologies offer trustless and permissionless business processes like never before. Millions of users - mainly developers, mathematicians and IT-professionals - started using cryptocurrencies, developing protocols and new applications.

2.2 Mission

At QANplatform we have created a secure, industrial-grade business platform, which facilitates and simplifies business processes and is easy to use for developers and all the players involved.

We connect business and blockchain in an environment-friendly way, significantly reducing energy consumption.

We offer adequate rewards for those who offer their computers for running nodes and those who write generic pieces of smart contracts.

2.3 Solution

QANplatform is a 5G-friendly blockchain platform that bypasses the limits of Ethereum in a number of ways:

- quantum-proof by design
- environment-friendly, thanks to its low energy consumption
- allows developers to write smart contracts in virtually any language* they have already mastered
- provides the speed required for nearly any industry process or financial transaction
- available for anyone, cost-effective, in some cases planned to be free
- built to benefit from 5G technology from ground up
- where developers and all participants are financially motivated in sustaining the platform

As key contributors, our core team members have gained significant experience in building several blockchain protocols before, and a few major, privacy-oriented coins. We are aware that existing protocols have shortcomings.

Currently, new technologies are being built and integrated into business processes from 5G to quantum computing. Some have the potential to fundamentally change the way we do business today.

We wish the best to the new generation of protocols that are currently emerging and we eagerly follow their achievements. Still, we want to make a breakthrough - as they are not there yet.

Innovation does not happen in an environment isolated from operating businesses and away from operating industries.

We at QANplatform are building a new blockchain protocol where most industrial and business applications are going to be written in the future.

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Competitiveness

- The basic functionality of QANplatform follows the standard set by Ethereum by running generic Turing-complete, token-metered smart contracts.

- Our platform utilizes precompiles so contracts can be deployed into multiple instances of the same bytecode under different addresses.

- QANplatform's Coin (QARK) is a unit of account that follows the usage of QANplatform protocol.

In our design we aimed for clear value-capture mechanisms to benefit from network effects.

This way increased network usage changes the unit economics of the Coin, allowing for more scalability at the same time.

Smart contracts are expected to disrupt not only business spaces, but whole systems of industry and finance.

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- Since 2015, we were used to associating smart contracts with the Ethereum blockchain.
  - In fact, Ethereum's success has been based primarily on introducing smart contracts
    - as trustless and permissionless business processes
    - that are self-executing and immutable after their signing.

- Smart contracts have become the primary focus of innovators and investors.
- The uses are limitless, as they can be used to build decentralized exchanges, tokenized assets, games and more.

3.1 Shortcomings of Existing Blockchains as We Know Them

Existing blockchains:
- apply a non-intuitive economic model of Gas prices,
  - so architecture sustainability prices are delegated directly to the end users.
- are game-theoretically biased towards miners.

Existing blockchains should also be more predictable for businesses, so that company finance directors could predict the real cost of future transactions.

The cryptographic primitives they apply:
- are not quantum-safe and
- constraint the system to adapt abilities over confidential data in contrast to recent / state-of-the art primitives (GDPR compliance issues).

In contrast to this, QANplatform uses fixed prices of usage given in FIAT. Therefore our solutions point towards a blockchain platform that's fairer and expectedly unbiased.

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Uniqueness
– Comparison with Ethereum

In 2019, practical use of smart contracts is still limited as

- platforms running them (e.g. Ethereum) are too slow,
- consume too much energy,
- have data management, and storage issues and
- developers need to learn a special programming language to code in them.

On the QANplatform,

- transactions have a fixed price in FIATs.
- deployment fees of data and transfers recorded on the chain
  - do not depend on the actual daily exchange rate of the coins
  - but have a pre-defined value in FIATs.

- Pre-defined 'Gas' prices given in FIAT make businessmen and company CFOs happy
  - as transaction prices are predictable and the company can put them in its financial plan.

- In addition, transactions are quantum-safe and GDPR-friendly at the same time.

*QANplatform brings a solution
to the following major problems:*

A. **Energy Efficiency:**
QANplatform's energy consumption
converges to zero.

Ethereum currently operates on the Proof-of-Work (PoW) consensus, that is high energy consuming and not environment-friendly by nature.

PoW consensus of Ethereum 1.0 consumes more electric power in a year than the Bolivian economy.

Proof-of-stake (Casper) of Ethereum 2.0 is in the works; release date still informal.

QANplatform operates the Proof-of-Randomness (PoR) consensus with verifiable pseudorandomness .

With QANplatform there are no unnecessary computing tasks, so the operation platform is environment-friendly.

*The consensus mechanism of QANplatform is
a new development called Proof-of-Randomness (PoR).
It's a generalization of Algorand, only with added scalability.*

(see the mathematical concept at: https://algorandcom.cdn.prismic.io/
algorandcom%2F218ddd09-8d6f-42f7-9db9-5cfbc0aedbe5_algorand_agreement.pdf)

B. **Scalability:**

5G-friendly layer 2-scaling is on
the roadmap of QANplatform

Ethereum is moderately scalable.
Growing amount of data, limited Transaction
per second (TPS) and unnecessary
calculations make the system slow down.

Sharding-update is predicted on the
roadmap but is still under research.

QANplatform is highly scalable, so millions
of users can communicate on a system
that runs without practical delay.

Due to its different approach,
QANplatform achieves high TPS
with relatively low computing and energy needs.

C. **Data Management:**

You can delete public data and you
can still manage private data.
(currently under further research and development)

Ethereum stores each and every hash/piece
of information on each and every device.

It means that every piece of information
is on the Ethereum blockchain, no
matter the data is public or private.

QANplatform has a feature called
private storage between nodes.

This ensures that private data is retrievable
only on nodes with proper permissions.

D. **IoT-Friendliness:**

Low-powered IoT devices can also join
crypto and the blockchain space.

Ethereum is unable to provide the possibility
for restricted computational environments
to communicate with each other.

QANplatform provides ability
for all IoT devices to communicate
and interoperate among each other.

IoT-Friendliness helps spreading of the platform worldwide.

E. **Programming Languages:**

From now on, you don't have to use
Solidity to write smart contracts

Ethereum's most stable language is Solidity, currently the most popular smart contract language.

To write a smart contract, developers must learn this new language.

Smart contracts on the blockchain handle money directly.
With Solidity it is easy to make mistakes.
And mistakes cost money and time.

QANplatform takes a different approach and lets developers write smart contracts in the major programming languages they already know.

QANplatform offers a compelling pricing model to developers:

*when a smart contract is deployed, you only pay
for the newly written part.*

Developers get an incentive to write reusable code modules.
Each developer makes an investment for himself by
writing code modules that other users will use later.
Newly written, genuine code becomes an investment in itself for each developer.

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Sustainability

5.1 Accountability of QANplatform

- QANplatform is an open blockchain platform with permissive licensing.
- Responsibilities can be properly attributed
  - while the system ensures full accountability of on-premise players.

- Each and every transaction and each piece of data of the transactions is registered and stored on an unerasable and immutable blockchain,
  - secure by nature.

- Each and every transaction is traceable and
  - all data is searchable.

As QANplatform offers unique, high-level data security solutions for third parties, its own security level meets currently available cryptography standards.

Therefore, the platform is fully accountable.

5.2. Simplicity of QANplatform

- QANplatform runs on low complexity code - compared to most existing blockchain platforms.
- High adaptability makes QANplatform an ideal tool for
  - industry operations,
  - high-volume, certified business transactions, and
  - smart contracts.

- Enhanced connectivity features make the system capable of handling data exchange in restricted computational environments
  - such as networks of IoT devices
  - over 5G networks.

The chance to write smart contracts in more popular, developer-friendly languages make developers' lives easier.

5.3 Sustainable Solutions from a For-profit Business Entity Behind QANplatform

- The company behind QANplatform is prepared
    - to develop standard and tailor-made solutions on the public QANplatform blockchain
        - for existing off-chain companies — financial institutions, service providers and other industries.
    - to develop private blockchains
        - for third parties with special solutions.

5.4 Security

- With our consensus protocol, a 51% attack is harder to implement,
    - because it requires an upfront fee from the block proposer (no need to buy mining equipment),
    - which will serve as a weight in the selection process
    - in contract to conventional methods, where this weight is the hash power.

- Attackers of popular PoW-based coins must buy expensive pieces of consumer-grade physical equipment (e.g. high-end GPUs) to run an attack, where equipment price serves as a burden to an attack.
    - Falling GPU prices can increase the chance of an attack.

- On the PoR-based QANplatform, attackers need to purchase a non-refundable license to participate in block validation.
    - Should the attack fail, this amount will be lost, which makes an attack a lot less appealing.

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Platform Background

6.1 History

- What is blockchain and why do people use it?

6.1.1 What are Blockchains?

- Blockchains are decentralized, distributed and public digital ledgers,
  - that record transactions across many computers.

- By design, blockchain is resistant to modification of the data.
  - It can record transactions between two parties efficiently and in a verifiable and permanent way.
  - Any involved record cannot be altered retroactively without the alteration of all subsequent blocks.

- Each blockchain is an ever growing list of records, called blocks, that are linked using cryptography.
- Each block contains
  - a cryptographic hash of the previous block,
  - a timestamp, and
  - transaction data.

6.1.2 A System That is Secure by Design

- For use as a distributed ledger, a public blockchain is typically managed by a peer-to-peer (P2P) network of computers around the world,
  - where the computers of private and corporate owners are situated in different parts of the world and
  - the computer owners do not know each other.

- These computers are
  - collectively adhering to a public blockchain protocol for inter-node communication and
  - for validating new blocks.

- The computers run the system without any central server or without any central authority.

- Once recorded, the data in any given block cannot be altered or backdated without alterating all subsequent blocks.
  - This requires an agreement (consensus) of the majority of computers in the network.

- Although blockchain records are not unalterable, blockchains are considered secure by design.

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6.1.3 The First Practical Use of a Public Blockchain: Cryptocurrencies

Since its invention in 2008, blockchain serves as the public transaction ledger of the cryptocurrency Bitcoin (BTC).

- BTC used to be the first digital currency to solve the double-spending problem without any need for a trusted authority or central server.

- BTC design has inspired other applications and blockchains. These are readable by the public and they are widely used by other cryptocurrencies.
  - Blockchain, therefore, is considered a type of payment rail.

- The most popular cryptocurrencies as of 2019 are: Bitcoin (BTC), Ethereum (ETH), Ripple (XRP), Litecoin (LTC)

6.1.4 Public Blockchains

- Public blockchains have absolutely no access restrictions.
  - Anyone with an Internet connection can send transactions to it and
  - anyone can become a validator (i.e., participate in the execution of a consensus protocol).

- Public blockchains usually offer economic incentives for those who run the blockchain on their own computers.
  - These users usually utilize some type of the outdated Proof-of-Work algorithm.

- Some of the largest, most known public blockchains are the Bitcoin blockchain and the Ethereum blockchain.

- A public blockchain
  - is not a drop box,
  - nor is it a conventional database that runs a billion + transactions per week.

- Therefore, we will not see Bitcoin or Ethereum power global trade or the Internet-of-Things (IoT) on their own (as they are designed today).

6.1.5 Private Blockchains

- Private blockchains are permissioned.
  - One cannot join it unless invited by the network administrators.
  - Participant and validator access are restricted for users within a company or a network of businesses and its associates.

- Private blockchains are middle-ground for companies that are interested in
  - the safety of blockchain technology and
  - improving their business processes by implementing secure and validated solutions offered by a blockchain.

- Typically, companies seek to incorporate blockchain into
  - accounting,
  - record-keeping, and
  - intra-company payment procedures without sacrificing autonomy.

6.1.6 Summary

Unfortunately - although the need for business blockchains has been present for many years — business and industry-ready blockchain solutions were not available until 2018 for most business customers.

Available blockchain solutions are:

- Too slow in terms of transaction speeds,
- consume too much energy and not environment-friendly,
- not scalable, limiting mass-adoption,
- need too much storage,
- cannot handle IoT devices — because of low interoperatibility capabilities, and
- difficult to program due to being written in a non-standard language.

At QANplatform we are building an industry-ready and business-proof solution that solves all of these problems.

QANplatform is a 5G-friendly blockchain platform which:

- bypasses the limits of Ethereum,
- provides the speed required for nearly any industry process,
- is environment-friendly thanks to its low energy consumption,
- allows developers to write smart contracts in any language they have already mastered,
- is quantum-proof by design,
- is built to benefit from 5G technology from ground up, and
- all participants are economically motivated to sustain the platform.

6.2 General Architecture

- The solution of QANplatform — like blockchains in general — is comprised of three fundamental layers.
- Each layer adds different components to the system development.

  - To develop a blockchain application or to use a blockchain application it is not absolutely necessary to get deeply involved in the most technical layers.

6.2.1 Network Layer

- Blockchains use a peer-to-peer (P2P) network, which enables groups of independent devices, called nodes, to interconnect and share data with each other - without any centralized servers.

- All nodes are equal and all of them have equal responsibilities within the network.

- The networking layer is where the rules set up on the protocol layer are actually implemented.

The QANplatform P2P layer is an "epidemic gossip" protocol much like Bitcoin's, where peers only need knowledge about their "neighbours". This allows us negligible network overhead on client level for they don't need consistency and knowledge about the whole network.

6.2.2 Database Layer

- The Database Layer contains the databases of all the transactions:
  - blocks,
  - timestamps,
  - metadata, and
  - hash.

- The platform utilizes a memory-mapped key value store for the data present on blockchains.

6.2.3 Crypto (Security) Layer

- This layer enables secure communication over an unsecure medium.
- According to Kerckhoffs's principle, any blockchain should be secure even if everything about the system, except the key, is public knowledge.
  - So the key is the only asset in cryptography that has to be kept secret and protected from intruder attacks.
- Many cryptographic primitives have a role in a decentralized blockchain application:
  - hashing creates links between the block,
  - the digital signature to sign and to verify transactions, and
  - asymmetric key cryptography to prove ownership of assets in trustless environment.

Our framework is the first in the world to provide a fully quantum-resistant stack of security.

This means that not only our Proof-of-Randomness (PoR), but all signatures and hashes (wherever they are prone to Shor-algorithm or Grover-algorithm searches) we exploit worst-case lattice problems and use state-of-the-art postquantum cryptography.

6.3 Quantum Hardness

- The QANplatform platform is proven to be secure against all known quantum-breaking algorithms and attacks.
  - The cryptography algorithms applied within the platform are resistant to attacks by both classical and quantum computers.

- Most encrypted data intercepted and stored today could be decrypted by quantum computers in the near future.

Not only the standard Rivest-Shamir-Adleman (RSA) and elliptic-curve cryptography (ECC) algorithms (which power e.g. international bank transfers and email systems security today) **are jeopardized by quantum computers, but all of the algorithms currently being used to protect encryption keys are subject to the same method of solution.**

QANplatform can keep information assets secure even after a large-scale quantum computer will have been built.

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6.4 Smart Contracts

6.4.1 Definition of Smart Contract

- In legal terms, a *contract* is a signed agreement between two parties describing an agreed-upon transaction with potential legal consequences if the terms are not met.

- A *smart contract* is a piece of computer software code that is designed to be an automated, self-enforcing contract between two parties.
  - Once the terms of the agreement have been set, the smart contract verifies their fulfilment and
  - the transaction takes place automatically.

- In addition, it is unchangeable after signing and it is recorded on a public chain.

Smart contracts are lines of software code that execute a specific function once certain conditions are met. For example, an online shop and a buyer implement a smart contract that ensures that "if payment is received, then products are delivered" — makes the whole process efficient and indifferent to human error: the funds will transfer across the network by themselves and the blockchain will record the transaction as unchangeable (public) data.

A *smart contract* is a transaction in fact, which runs deployed on a blockchain network.

- The first platform running smart contracts was Ethereum in 2015.
- In 2019, 96% of smart contracts is still based on Ethereum.
- [New generation platforms together already run the majority of applications built in 2019 — more than Ethereum.]

- As we saw it earlier, Ethereum is unable to serve the growing needs of industry and business.
  What is the future of smart contracts then?

*QANplatform platform still offers a solution
to the future of smart contracts in an industry-ready environment.*

6.4.2 The Future of Smart Contracts According to QANplatform

- Smart contracts are important
  - not only in the blockchain space and the cryptocurrency markets but are also
  - perfectly suited to the financial services industry.

- The technology can be widely used
  - to automate the clearing and settlement of trades,
  - the payment of bond coupons, or even
  - the calculation and pay-out of insurance claims.

- Smart contracts are versatile enough to apply to practically any industry in which
  - funds,
  - digital assets, or
  - any kind of digital information about their transactions
    needs to be transferred between parties:
    - suppliers,
    - buyers, and the
    - financing partners

- In the **_healthcare sector,_** the technology is being explored as a countermeasure against data manipulation in clinical trials.

- Smart contracts can even be used to enforce intellectual property agreements
  - by establishing a definitive record of shared ownership rights and
  - allocating all royalties and earnings from pieces of intellectual property accordingly.

At QANplatform we strongly believe that the innovative players in the sector of corporate investments will rapidly implement blockchain solutions as soon as a blockchain platform is able to satisfy their needs regarding transaction speed, scalability and ease of programming.

The scene of IP-driven technology investments with standardized development and prototyping procedures (characteristic for the medical device and pharma sectors) may soon benefit from our corporate solutions under development.

6.4.3 Solidity Language

- Smart contracts on the Ethereum platform are written in a programming language called Solidity.
- Solidity is the self-created programming language of Ethereum and
  - it is not used for purposes other than coding on the Ethereum platform.

- Each developer must learn the Solidity language to write smart contracts.
  - Developers cannot use any other popular, widely used programming languages they would prefer,
  - even if they have been using them for many years.

- Since 2015, Solidity has not managed to become a popular coding language.
  - Many developers struggle with it and
  - not many are fully proficient, even among Ethereum contributors.

- **Smart contracts on the blockchain handle money directly.**
  With Solidity it is easy to make mistakes. Mistakes cost money and time.

- **Ethereum and Solidity are unable to fully serve the growing needs of industry and business.**

The QANplatform platform takes a different approach and lets developers write smart contracts in the language they already know.

6.4.4. Developers of Smart Contract

- A smart contract developer
  - is a skilled professional who understands the essence of smart contracts and
  - is able to create them over a blockchain platform by programming it over the native language of the given blockchain.

- So far this native language has been Solidity, the only language of the Ethereum blockchain.

7

System Functions

7.1 Block Generation

A **block generation** is a creation of a new block on the blockchain. Blocks are generated by mining nodes according to a specific protocol.
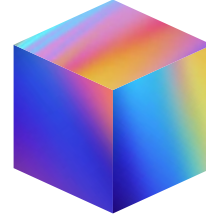
7.2 Mining

- In most blockchains, miners are individuals with their computers who contribute their computing power to verify the information on blockchain transactions and then add them in blocks on the blockchain.
  - A miner is (ideally) an owner of the mining node.

- Miners receive compensation in return,
  - compensated with the cryptocurrency of the given blockchain, hence the Proof-of-Work.

- Mining is a competitive process, but it is more of a randomness competition than a race.
  - On average, someone will generate acceptable Proof-of-Work in each given period, but who it will be is anyone's guess.

- Miners pool together to increase their chances of mining blocks,
  - which generates transaction fees and, for a limited time,
  - a reward of newly-created Bitcoins.

- Numerous other blockchains (that only allowed for the transaction of their respective tokens on their networks) were released after Bitcoin took off.

- While the blockchain community was deeply involved in Initial Coin Offerings (ICOs) and cryptocurrency trading, members of the community had seemed to have forgotten the abstract value of blockchains, that is
  - to create incentivized decentralized peer-to-peer networks.

- The applications of such networks were limited to tokens, while cloud computing firms were meanwhile taking peer-to-peer networking innovations to new levels in data storage and security.

This was the situation until 2015 when Vitalik Buterin of Canada released the Ethereum blockchain.

7.3 Consensus - Proof-of-Randomness (PoR)

- In general, consensus decision making is a way of reaching agreement between all members of a group.

At QANplatform, block proposers weighted by their committed stakes elect themselves in a verifiably random manner without the possibility of tampering and manipulation.

- As a blockchain technology term, 'consensus' means that the nodes on the network agree on the same state of a blockchain, in a sense making it a self-auditing ecosystem.

- Consensus protocols allow a blockchain to be updated, while ensuring that every block in the chain is true as well as keeping participants incentivized.

7.4 Types of Consensus Algorithms

- A consensus algorithm is to verify that information being added to the ledger is valid or not.

- It is used to achieve agreement on a single data value among distributed systems. Consensus algorithms are designed to achieve consistency in a network involving multiple nodes.

- Without consensus algorithms, blockchains would not be able to function properly:
  - they could not remain decentralized and completely verified.

- Most popular consensus mechanisms are the Proof-of-Work (PoW) and Proof-of-Stake (PoS) systems.

- The best-known method of reaching consensus on a blockchain is the PoW scheme,
  - which is also used by Bitcoin.

- PoW does not require all parties on the network (all nodes) to submit their individual conclusions in order for a consensus to be reached.

The introduction of blockchain brought the evolution of consensus algorithms. Many more algorithms have been established to solve the faults of the first ever PoW algorithm system.

Each consensus algorithm has its own set of advantages and disadvantages. Depending on the type of industry and the framework you build, you can choose the best suited algorithm for your business.

7.4.1 Proof-of-Work Consensus

- The Proof-of-Work (PoW) was the first ever consensus algorithm utilized for block generation:
  - it is used to process blocks of transactions
  - and add them to the blockchain.
- Nodes within the network verify each block before it is added to the blockchain.

With PoW, the more computing power the miner has, the more mining power he or she has.

- A Proof-of-Work is a piece of data which is difficult (costly, time-consuming) to produce but easy for others to verify.

- Producing a Proof-of-Work is a random process with low probability.
  - A lot of trial and error is required before a valid Proof-of-Work is generated so it requires a tremendous amount of energy.
    - E.g. the Bitcoin blockchain requires significant power, greater than the power consumption of many countries, to remain secure and operate in-line with its mission.

- The very first implementation of a distributed and trustless consensus algorithm was Bitcoin's PoW algorithm.
  - Proof-of-Work also forms the basis of many other blockchains (and their cryptocurrencies), incl. Ethereum,
    - that also plans to switch for a more sophisticated algorithm in the future to maintain competitiveness.

7.4.2 Proof-of-Stake Consensus

- The Proof-of-Stake (PoS) algorithm utilizes validators who are chosen on certain criteria
  - that includes coin age and
  - economic stake.

PoS states that a person can mine or validate block transactions according to how many coins he or she holds.

- PoS also requires significantly less energy thanks to its validator selection criteria.

With PoS, it depends on how much cryptocurrency the miner owns.

- PoS uses economic incentives to secure network security.
  - The theory is that the use of economic game theory is a better and more efficient way to maintain network consensus.

- PoS nodes consume less electricity beyond the very small cost of downloading and processing the blockchain,
  - as the protocol itself takes on the role of assigning validators ("virtual miners") the right to produce blocks on a random schedule.

- These algorithms, however, carry several challenges, as there are hidden functions that PoW does provide but PoS does not.

7.4.3 Proof-of-Randomness (PoR)

QANplatform runs on the algorithm of Proof-of-Randomness, which derives from Silvio MICALI's verifiable randomness theory that also drives Algorand.

- QAN's Proof-of-Randomness mechanism is a generalization of Algorand, where users/ nodes are not weighted - or rather they are weighted in a uniform manner.
  - This serves as our "solution" to the FLP problem where conventional Algorand coordinates Virtual routing and forwarding (VRF) selections in epochs which is knowingly an unscalable solution.

- Technically, Proof-of-Randomness is a "neighbour-only" randomness game,
  - where we do not assume complete or even partial knowledge about the network participants,
  - only direct (DHT-like XOR buckets or geolocation) peer neighbours and
  - piggyback current (assumingly not consistent) knowledge about the network on multilayer confidence-values.

- These confidence values are modelled game-theoretically to form a Bayesian Nash Equilibrium. The Bayesian noise is "corrected"
  - with verifiably random sampling paths in the network.

8

Governance
(Token Model)

8.1 Description of Actors and Their Interests

Why do people, businesses, and industries use the QANplatform protocol?
Below we list the interests of all actors and also their ultimate economic benefits stemming from the system.

We also highlight the value-capture mechanisms from the use of
the QANplatform token within the ecosystem.

This provides the core of the Token Architecture.

Actors	Benefit	Effort / Resource Provided	Comments
1. Generic Smart Contract Developers	Get QARK after their code is being reused by the Specific Smart Contract Developers.	1) Write as much generic code as possible. This makes it easy for the Specific Smart Contract Developers to implement it in their applications. 2) Pay for code deployment based on fixed FIAT rates, which is appealing to the enterprise sector for predictable pricing	Highly valuable and unique element, based on VRIO (valuable, rare, inimitable, organizationally exploited).
2. Specific Smart Contract Developers	General (non-blockchain) developers can finally enter the blockchain / smart contract development market, writing in their known language. They write code with confidence without having to learn additional skills.	1) Have to pay for their custom code in full to the validators (code deployment). 2) Have to pay a fraction of the full price as a license fee to the Generic Smart Contract Developers.	The network should redistribute the license fee back to the Generic Smart Contract Developers.
3. Validators	The benefit equals the part of the Issuance Pool validated by the validator. It includes the transaction and deployment fees plus his/her initial deposit fee.	Validator pays a deposit fee to enter the pool of validators who have the right to validate a following block. Once the deposit fee is paid, the Validators wait in line for their turn to validate the next block. The order is random.	Deposit gives the right to validate. Its value is uniform. It does not determine order or provide priority. Goal is to be as inclusive as possible.
4. Full-Node Provider	Node providers get a reward for giving access to their storage for the blocks to be validated (tokens generated by the network), in proportion to the storage actually used by the blocks.	Giving constant access to his/her storage on a capable device.	Unique feature for sustainability: Validator and F-N Provider roles are to be linked.
5. Smart Contract User (Transactor)	Interacting with certain applications in a fully trusted, uncensored way.	Pays for transaction fees. Fees are fixed in FIAT, long-term predictable. All operations which modify data require payment of a transaction fee. e.g.: Looking up whether a registration number is in a database requires no fee to be paid (no data is written to the chain). Entering a new registration number into a database requires a fee to be paid, as it adds data to the chain.	Provides income for the platform. Provides the basis for the Issuance Pool, combined with the Deployment fees.

8

9

Flow Chart

Based on the above table of the actors and their interests, the flow chart below shows the token flow, separated into two major segments.

The Network on the left side works based on the Network Operating Rules, while the open market on the right side is where the token is traded.

Between them all the actors are identified, acting based on their interests to maximize their own value-capture.
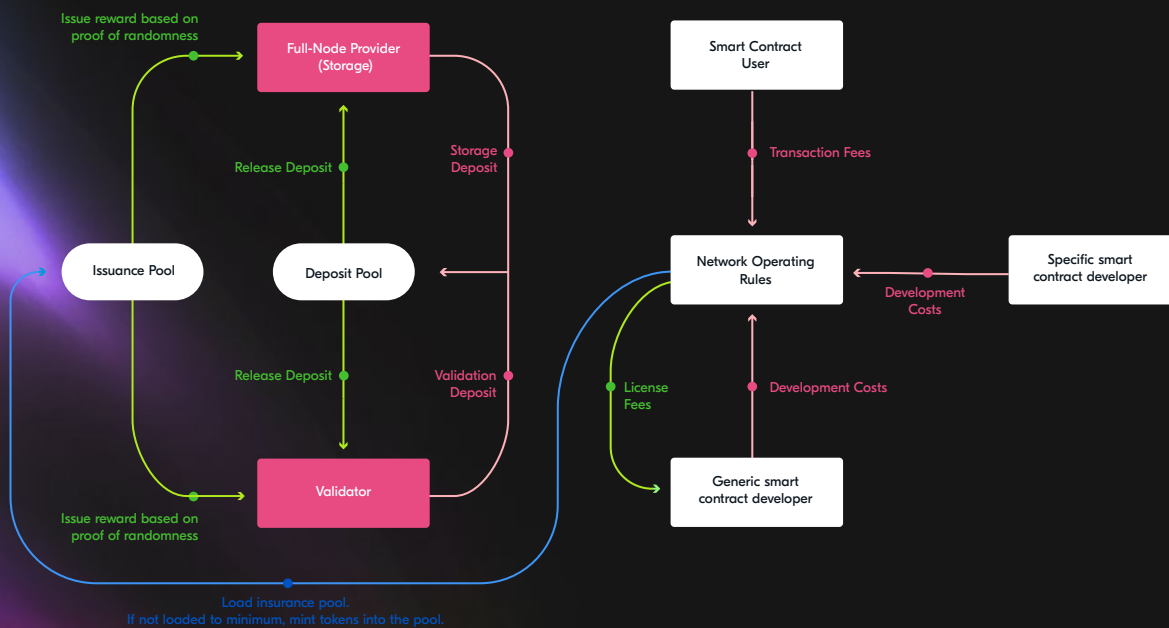
10

Business Model

10.1 Token description and use of Token

QARK is not a security and gives no right to dividend payments, interest payment, participation in the liquidation procedure and rights to liquidations proceeds of the Company. QARK does not give right to participation, petition and/or voting rights in the shareholders meetings or any other meetings of the Company. In conclusion, QARK has only utility functions, therefore QARK is a utility Token.

The generated token has multiple functionalities for different utilities. These are the following:

a. **pay for contract deployments:**
   Developers must pay a fee to deploy new smart contracts on the platform. This fee is paid in QARK Token(s) and the amount of fee relates to the size and logic of the deployed contract

b. **pay for executing methods of deployed contracts:**
   Applications users may need to pay a fee for using certain smart contract functions where the operation casues data to be written to the blockchain. This fee must be paid in QARK Token(s), and the amount of the fee may relate to the lenght of the data written and the complexity of the executed smart contract function.

c. **pay for fees of token transfers:**
   When users send QARK Token(s) as a value transfer to another address, they must pay a transaction fee. This is a flat fee and does not correlate to the amount of QARK Token(s) sent along the transaction.

10.2 Actors and Their Interests

10.2.1 Generic Smart Contract Developers

a. Write code - as generic code as possible.
   This makes it easy later for the Specific Smart Contract Developers to implement it in their applications.

b. In order to commit their code to the Network, they need to pay a deployment fee.
   To cover this fee, they buy the tokens from the open market or mine for themselves.

c. When their code is being reused by the Specific SC Developers, the network bills the specific SC Developers a specific number of tokens, based on the ratio of reused code.
   Then the network redistributes it as a reward among the Generic SC Developers, based on the ratio of reused contribution.

d. They have the opportunity to sell these reward tokens in the open market.

10.2.2 **Specific Smart Contract Developers**

a. They write specific code to build dApps (applications, decentralized apps),
    mainly by reusing pieces of code written by the Generic SC Developers. Based
    on the reused code, they pay a usage fee as detailed above.
b. They also pay a deployment fee for their code to be committed onto the Network.
c. To cover their two above-listed cost elements they need to buy tokens from the open market.

10.2.3 **Users**

a. They interact with decentralized apps (dApps) written by Specific SC Developers.
    Based on their type of interaction (as detailed within the actors table),
    they might need to pay transaction fees to the Network.
    To be able to pay for the transaction fees they ought to buy tokens from the open market.

10.2.4 **Validators**

a. Validators assure the integrity of the transactions by validating the blocks based on the Proof-of-
    Randomness consensus mechanism.
    To be able to join the pool of potential validators, a Validator needs to stake a
    fixed amount of coins in a Deposit Pool to serve as his or her stake.
b. Whenever a particular validator wins the validation process, the Validator also
    receives all the coins as rewards from the Issuance Pool. (That contains the tokens
    coming from the transaction and deployment fees within the particular block).
c. To be able to stake the tokens to participate, a Validator needs to buy them from the open market.
d. After the Validator successfully validates a block, he/she can sell its reward in the open market.

10.2.5 **Full-node Providers**

a. They are constantly running the software on a capable device, providing storage space for the network.
    To be able to join the network as a Full-Node Provider they need to pay a registration fee.
b. This registration fee is a fixed cost and through the network it is being
    funnelled to the Founders' Pool (the founding team).
c. To pay this registration fee upfront, they need to buy tokens from the open market.

d.   After they became a Full-Node Provider they receive a fixed number of
        tokens after each validated block - in exchange for their services.
        (The reward amount might not be fixed over time, depending on the result of the modelling.) They receive
        these tokens from coin base transactions, meaning that these tokens are being generated by the network
        (inflationary mechanism).

e.   After receiving rewards, they can sell these in the open market.

10.3 Functioning of QANplatform

The functioning of the decentralized QANplatform relies on two players:

#1   Node Operators

#2   Randomly-selected Block Validators

• Both players are motivated by a monetary reward so that they have an interest in running the network.

10.3.1 Issuance Pool

•   Both players receive their reward from the Issuance Pool,
    •   that distributes a fixed number of tokens at equal periods
        between the Node Operators and Block Validators
    •   to encourage financial equilibrium in terms of token supply and demand

10.3.2 Revenues of the Network

The issuance pool consists of 3 parts:

#1   Transaction costs, paid by smart contract users

#2   Code deployment costs, paid by Specific
        Smart Contract Developers

#3   Code deployment costs, paid by Generic
        Smart Contract Developers

10.3.3 Deposit Pool

•   The Deposit Pool is a digital depository that was
    created to eliminate fraud at block verification.

•   Each Block Validator candidate must
    pay licence fee to participate in block
    validation into the Deposit Pool.

•   After a candidate for block validation
    is selected he or she receives a reward
    for verifying the transaction.

10.3.4 Minting

•   Running the network and rewarding Generic
    Smart Contract developers also involves costs,
    •   therefore, it is possible that the Issuance
        Pool and the Deposit Pool together may not
        cover rewarding the transaction players.

•   In this special case, to maintain equilibrium,
    the network creates ('mints') new tokens.

•   Should the network hold more tokens in a
    given moment than needed for rewards,
    it burns the surplus automatically.

10.3.5 Network Operating Rules

- Network operating rules were created as a system of practical rules
  - to maintain proper functioning of the network.
- These rules are designed
  - to summarize the revenues and costs in the Issuance Pool, which are related to the developers and
  - to distribute the rewards between parties running the system
    — Full Node Operators and Block Validators.

10.4 Revenue and Cost Plan Items

10.4.1 Revenues List

- Sale of QARK Tokens — paid by token buyers
- License fees for using generic smart contracts — paid by users/developers of smart contracts
- Block miners fee — paid by miners
- Storage fees — paid by users who store data on the blockchain

10.4.4 Costs of Token Issuance

- The entire token creation and issuance procedure is financed and advised by www.centrumcircle.com upon an agreement, including costs of marketing, IT development, legal, administration and regulatory procedures, in exchange for 44,444,400 QARK tokens (app. 13% of tokens issued).

10.4.2 Cost Structure Plan

- Product development _____ 55%
- Marketing costs _____ 15%
- Operations and administration _____ 15%
- Legal costs _____ 5%
- Reserve _____ 10%

10.4.3 Use of Funds

- Platform development and upgrade _____ 55%
  - used to build the platform and perform upgrades to the system, which also includes development, training, and recruitment budget.
- Marketing _____ 15%
  - used for QANplatform branding and marketing, including continuous promotion and education about the QANplatform technology. Main target groups within the developer community and technology investors.
- General administration and management _____ 15%
- Reserve _____ 10%
- Legal and regulatory _____ 5% .

5% 10% 15% 55% 15%
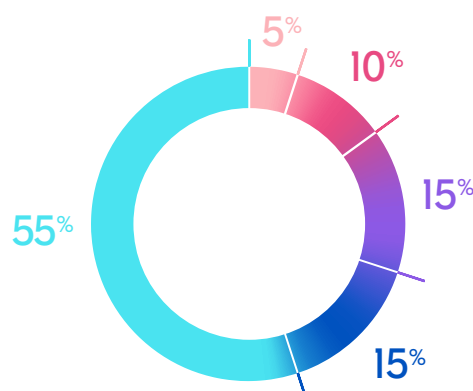
11

Value-Capture

11.1 Value Generation

**The QANplatform ecosystem generates and captures value
in the coin of QANplatform (QARK) in two ways:**

11.1.1 Real Value

- Real value is captured through the real cost of running applications (dApps).
    - This cost is paid for by the users.

- Real Value is essentially the cost of computing resources.
    - It also provides as a baseline for any developer
        - who wants to build dApps on the QANplatform protocol and
        - tries to understand the costs involved with development / maintenance.

11.1.2 Added Value

- Added value is captured through the utility value of the applications (dApps) that are created on the protocol.

- QANplatform have been pursuing initial use-cases
    - to establish a strong foundation for applications with high value-add.

- As the ecosystem evolves this added value-capture will gradually be driven by the community of developers.

- The dynamics of value-capture inform our mathematical models that aim to provide a systemic description of how token value and price is to be determined, based on a range of scenarios.

12

Legal Terms of Public Sale Procedure of The Token of QANplatform

12.1 The Token Sale/Purchase Transaction - Onboarding Process

- The Public Sale process of the QARK tokens will be managed by the exchange platform of bitbay.net in the form of an Initial Exchange Offering (IEO). bitbay.net will act as the initial trading platform of QARK tokens publishing actual exchange rates. QARK tokens may also be listed on other crypto exchanges.

- To participate in the above specified procedures and features of the QANplatform, each interested party needs to pass through the on-boarding process of bitbay.net, completing a standard procedure. (Existing clients of bitbay.net may proceed to purchase QARK tokens without additional steps.)

- The on-boarding procedure consists of the following standard steps:

  1. Answer the Know Your Customer (KYC) and Anti Money Laundering (AML) question list and fill in the requested personal data.
  2. Accept standard Terms and Conditions.
  3. Sign the Simple Agreement for Future Tokens (SAFT) contract digitally.
  4. Transfer the purchase price in cryptocurrency to BitBay's escrow account.
  5. Receive QARK tokens in the clients own wallet.

- The Issuer reserves the right to enlist QARK tokens on other exchanges as secondary exchange platforms as well. Any party capable of successfully completing the KYC / AML procedures meeting international standards and requirements (with special regards to the Estonian rules and regulations) can purchase QARK tokens with the exception of
  - citizens of countries with restrictions, and
  - PEP (politically exposed persons)
    who cannot purchase QARK tokens.

What are the buyers getting when purchasing QARK tokens?

QARK token ownership is registered in an ERC20 token contract on the
Ethereum platform until the platform itself launches.
Buyers can receive ERC20-based QARK tokens using their Ethereum (Elliptic Curve based) keypairs.

The QANplatform will use different (Lattice based, Quantum Computing resistant) keypairs in general. However, to allow a seamless transition from the ERC20-based token to the platform, there will be a special transaction type allowed on the platform which MUST meet the following criteria:

Nonce MUST be 1 and the recipient address MUST be a Lattice based address.

The prior ERC20 contract running on the Ethereum platform will be destructed first and all final balances of the token holders will be put in the Genesis Block of the QANplatform.

This allows the buyer to get the final QANplatform native tokens without requiring any interaction on their end and without having to trust any third party to make the transaction.

- There is no additional cost for the buyer purchasing QARK tokens other than possible third-party costs (e.g. banking fees, exchange fees, Ethereum Gas cost or other relevant blockchain fees).

- Any party capable of successfully completing BitBay's KYC / AML procedure can participate in the public sale and purchase QARK tokens, with the exception of
  - citizens of countries with restrictions, and
  - PEP (politically exposed persons)
  who cannot purchase QARK tokens on the bitbay.net platform.

12.1.1 Length of Public Sale Period

- The Public Sale period is expected to start in Q1 2020 and to last up to 9 weeks or as long as token stock lasts (see 11.1.2.2 below - Pools for Sale).

12.1.2 Subject of the Sale/Purchase Agreement, Summary of the Offering

Token Name / Symbol	QARK token / QARK	Unsold Tokens	Unsold tokens are deployed to Reserve
Technology	ERC-20 Ethereum	IEO Start	October 2019
Token Type	Utility	Token Allocation	Private Sale ~ 39% Public Sale ~ 27% Management ~ 13% Centrum Circle Token Holders ~13% Reserve ~7% Bounty ~1%
Total Tokens Generated at TGE	333 333 000	Lock-Up Period	Management Tokens - 6 Months Reserve - 12 Months
Total Tokens for Sale	222 222 000	Token Price Private Sale	Private Sale n.a. Pre-Sale n.a.
Tokens for public sale	min. 88 888 800	Token Price Public Sale	Pool 1: 0,27 USD 25 % Pool 2: 0,33 USD 50 % Pool 3: 0,39 USD 25 %
Payment accepted	All tokens accepted on BitBay	Distribution of tokens	Immediately

12.1.2.1 Number of Tokens Offered for Sale

- QANplatform will generate a total of 333 333 000 (three hundred thirty-three million and three hundred thirty-three thousand) tokens as standard ERC-20 tokens.
  - These tokens will be created at the time of the Token Generation Event (TGE).
  - All details of the relevant smart contract will be published during the TGE on the website.

- QARK tokens will have no functional value until the QANplatform goes public.
  - New token functions will be added to the platform as code development happens.
  - QARK will be a speculative token, which means it is tradeable.

12.1.2.2 Pools for Sale

- QANplatform will offer 222 222 000 (two hundred twenty-two million and two hundred twenty-two thousand) tokens for sale.

- Sales Pools' number and size:
  - Pool #1 [Early Bird]:   22 222 200 tokens at the price of USD 0.27 (1 week)
  - Pool #2:   44 444 400 tokens at the price of USD 0.33 (3 weeks)
  - Pool #3:   22 222 200 tokens at the price of USD 0.39 (5 weeks)

- The public sale of QARK tokens is intended in three pools.

  I.   In the first pool (called Pool #1 / Early Bird) is sold up to 10% of the total amount of QARK tokens offered for sale. In **Pool #1** QARK tokens are sold for up to 1 week from the start of public sale, at a price of **USD 0.27**.

  II.   In the second pool (called Pool #2) is sold up to 20% of total amount of QARK tokens offered for sale. In **Pool #2** QARK tokens are sold for up to 3 weeks after Pool #1 closure, at a price of **USD 0.33**.

  III.   In the third pool (called Pool #3) is sold up to 10% of the total amount of QARK tokens offered for sale. In **Pool #3** QARK tokens are sold for up to 5 weeks after Pool #2 closure, at a price of **USD 0.39**.

- At least 40% of the total amount of the QARK tokens offered for sale is intended to be kept for public sale.

  I.   After the private sale period, if more than 40% of the total amount of QARK tokens offered for sale remains unsold, the rest of the 40% is automatically transferred to the first pool (Pool #1 / Early Bird).

  II.   The rest of QARK tokens - not sold in Pool #1 (Early Bird) - is automatically transferred to Pool #2.

  III.   The rest of QARK tokens - not sold in Pool #2 - is automatically transferred to Pool #3.

  IV.   The rest of QARK tokens - not sold in Pool #3 - is automatically transferred to the Reserve after the public sale closure.

12.1.2.3 Token Distribution Table

Total Number of Tokens: _____ 333 333 000 (100%)

Tokens for Sale: _____ 222 222 000 (~ 67%)
Tokens for Private Sale and Pre-sale: _____ 130 000 000 (~ 39%)
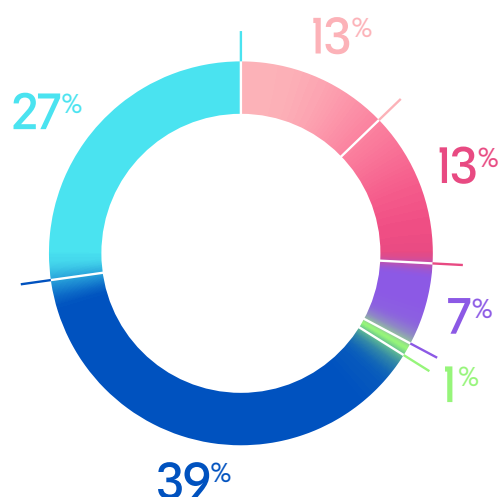Tokens for Public Sale: _____ 88 888 800 (~ 27%)
Bounty: _____ 3 333 200 (~ 1%)

Tokens not for Sale: _____ 111 111 000 (~ 33%)
General Reserve: _____ 22 222 200 (~ 7%)
Management Tokens: _____ 44 444 400 (~ 13%)
Tokens for Centrum Circle Token Holders: _____ 44 444 400 (~ 13%)

■ Private Sale _____ 39%
■ Public Sale _____ 27%
■ Centrum Circle _____ 13%
■ Management Coin _____ 13%
■ Reserve _____ 7%
■ Bounty _____ 1%

- QARK tokens will be allocated as follows:

  I. A maximum of 39% of total tokens (130 000 000) is to be sold during the Private / Pre-Sale Period. Unsold tokens of this allotment are automatically transferred to the Public-Sale period.
  II. A minimum of 27% of total tokens (88 888 800) is to be sold during the Public Sale Period. Unsold Tokens of this allotment are automatically transferred to the Reserve Pool.
  III. 13% of total tokens (44 444 400) is deployed to Centrum Circle Token Holders.
  IV. 13% of total tokens (44 444 400) is reserved for founders, current and future employees and advisors.
  V. A minimum of 7% of total tokens (22 222 700) is to be allocated to Reserve.
  VI. A maximum of 3 333 200 tokens is to be allocated for the Bounty Campaign. Undistributed tokens of this allotment are to be automatically transferred to the Reserve Pool.

12.1.3 Determination of Soft Cap

QARK Issuing has no defined soft cap. By starting the Public Sale the Issuing is considered as successful.

12.2 Sales Restrictions (for Token Holders)

A.   Tokens for Sale

• Tokens for Private and Pre-Sale.

• There is a 6 month sale restriction for tokens sold in the private sale period and they can not be sold below the issuance price of the third pool of Public Sale.

• Tokens for Public Sale.

There are no sale or exchange restrictions for tokens sold in the public sale period.

B.   Management Tokens

Management tokens represent 20% of the total amount of QARK tokens offered for sale. This represents 13% all generated tokens. Management tokens are under sale restriction for 6 months from the start of the public sale period.

C.   Reserve

Reserve tokens represent a minimum of 10% of the total amount of QARK tokens offered for sale. This represents a minimum of 7% all generated tokens. Reserve tokens are under sale restriction for 12 months from the start of the public sale period.

12.3 Unsold Tokens

Unsold tokens are automatically transferred to the Reserve after the closure of the Public Sale period.

12.4   Mining

Mining available upon buying a Mining License.
All Miners have equal chance for running to validate a block.
Random selection of the 'Block Proposers'.

12.5 Bounty Reward

A maximum number of 3 333 200 QARK tokens is to be allocated from the Pre-Sale pool for the Bounty Campaign.
Types of the Bounty Campaign are:

- Hacker challenge

- Airdrop

- Token Challenge

Terms of the Bounty Program are available - see attachment

12

13

Risk Factors

Foreign Currency Risk

Foreign currency risk arises mainly from the acquisition of securities denominated in foreign currencies or from foreign currency receivables and liabilities. Foreign exchange rates may be affected by various political and economic factors, including interest rate levels, the balance of payments between countries, the monetary, fiscal and trade policies pursued by the governments of the relevant currencies.

Liquidity Risk

Liquidity risk means the ability of the Company to meet its contractual obligations on time and it arises from differences between maturities of assets and liabilities. Management of the Company and its strategy is based on risk policies, resulting in various liquidity risk measures, limits and internal procedures. Such risk policies and internal procedures may, however, not be adequate or sufficient in order to ensure the Company's access to in order to ensure sufficient liquidity. The liquidity risk may have material adverse effect on the operations, financial condition and results of operations.

Operating Risk

Operating risk is a risk of potential loss caused by human, process or information system failures and flaws. In according to human, process or information system failures and flaws, the operating risk embraces risk of corporate fraud and misconduct. When completing transactions, transaction limits and competence systems are used to minimize potential loss. The Company is constantly monitoring the information systems and supervise its own operations. Thanks to these activities there is a possibility to identify risks of system failures, flaws or fraud and mitigate the operating risk. The information received from the monitoring of the information systems and operations of the Company is used to correct the flaws in information systems and avoid failures thereof.

Personnel and Management Risks

There is a risk of management errors at the level of the Company. These may result in unforeseeable losses and costs which could adversely affect the results of the Company and lead to the insolvency of the Company The economic success of the Company depends to a large extent on the abilities of the management of the Company. The loss of employees with appropriate key qualifications may result in the risk that expertise is no longer available. If the key personnel cannot be permanently replaced by qualified employees, this may have a significant adverse effect on the economic development of the company (so-called key personnel risk). The ongoing and dynamic changes in the market for crypto assets and blockchain technologies require the Company to make permanent adjustments to their structures - both in terms of personnel and technical infrastructure. This entails the risk of making wrong decisions in terms of organizational and personnel development. This also results in a strong dependency on the available personnel and their level of training. Intense competition on the personnel market for managers and skilled personnel exists, which can lead to higher personnel costs.

Issue Costs

The capital raised through the issue is also used to offset the costs associated with the Offering and is thus not available in its entirety for investment. The Company may incur higher costs if it becomes necessary that the Company intensify its sales activities. This would adversely affect the ratio of issue costs to issue proceeds. As a result, there is a risk that the Company will not be able to carry out its planned business activities.

Changes in the Tax Environment

Future changes in tax laws and differing interpretations of laws by tax authorities and courts cannot be precluded. To this extent, adverse changes in tax law may have a negative impact on Company's business activities and/ or results of operations. The Company shall use different cryptocurrencies in the course of its intended business activities. The tax treatment of cryptocurrencies and transactions with such currencies has not yet been clarified. This brings about considerable risks regarding

the tax treatment of the Company's business activities. Due to the unclarified tax treatment - in the case of a different valuation by the tax authorities and courts for the tax treatment of the Company - subsequent tax claims against the Company cannot be excluded.

Risk of Criminal Offences

Due to the system, security token offerings are subject to increased susceptibility to fraud, money laundering and terrorist financing. This increases the investor's risk of losing the capital it has invested, also due to necessary measures taken by the authorities against the operators or other persons involved in such illegal transactions.

Qualified Advice

The information contained in this document does not replace any qualified advice that may be required from a third party. An investment decision should not be made solely on the basis of the information in this section or prospectus, as the information contained herein cannot replace advice and information tailored to the needs, objectives, experience and knowledge and circumstances of the individual investor. Otherwise, there is a risk that the investor may acquire an investment that is unsuitable for him.

Failure to Obtain, Maintain or Renew Licenses and Permits

The Company may be legally required to obtain licenses and permits to lawfully carry out its activity in different jurisdictions. Such legal requirements may be subject to modifications and new legal requirements applicable to any of the Company's parties may arise in the future.

Conflicts of Interest

Any party related to the Company, such as majority shareholders, companies controlled by the Company or in which the Company has an interest, and any other affiliates of any kind, can carry out and continue to carry out transactions with other related parties. If a conflict of interest comes about between any of the Company's affiliates and any party related to the Company, this could result in the conclusion

of the transactions for reasons unrelated to market forces.

Contractual Risks

The operations of the Company are materially dependent on the validity and enforceability of the transactions and agreements entered into by the Company. These transactions and agreements may be subject to the laws of Estonia or to the laws of other countries where the Company operates. While due care is taken to ensure that the terms of these transactions and agreements are fully enforceable under the laws applicable to them, occasional contradictions and variations of interpretation may occur. Consequently, the Company may not be able to always enforce their contractual rights. Therefore, it cannot be fully excluded that certain terms of the transactions and agreements entered into by the Company turn out to be unenforceable, which in turn may have material adverse effect on the Company's operations.

Exposure to Civil Liability

The Company operates in a legal and regulatory environment that exposes it to significant risk of claims, disputes and legal proceedings. The results of such disputes are inherently difficult to predict and even the disputes themselves, not only unfavourable outcomes, may result in the Company incurring significant expenses and damages, and in negative eff which in turn may have material adverse effect on the Company's operation, financial condition and results of operations.

Uncertain Regulatory Framework

There is great uncertainty surrounding the legal regulatory framework of cryptographic tokens, digital assets, and blockchain technology. In many jurisdictions, it has not yet been regulated, and it is difficult to forecast how such regulation will take place in the future. In others, there are regulations; however governmental authorities may decide to modify the existing laws and regulations that govern cryptographic tokens, digital assets, blockchain technology and its applications. Such modifications could have a negative impact upon the Company's activities.

Theft and Loss Risk

The technology of issuing and distributing tokens, despite maintaining the highest security standards by the Company, does not exclude the possibility of theft or loss of the Offered Tokens. The Company is not responsible for the Offered Tokens stored on third-party platforms, cold wallet and in cases resulting from the investor's failure to observe the precautions and safety rules generally accepted in the virtual currencies industry.

Attacks by "Hackers" and Sabotage

There is a risk of hacker attacks on the IT infrastructure used by the Company and essential networks and technologies. As a result, the Company may be partially, temporarily or even permanently prevented from carrying out its business activities. In addition to hacker attacks, there is risk that employees of the Company or third parties may sabotage the IT systems, which may lead to the failure of hardware and/or software systems of the Company. This may also have a negative impact on the Company's business activities.

Wallet and private key

The wallet required by the Investor must be compatible with Ethereum blockchain. If the Tokens are transferred to an incompatible wallet, normally the Investor will no longer be able to access and dispose of the Tokens. This will mean a total loss of its investment for the investor. The investor bears full responsibility regarding the decision on the correct (compatible) wallet. The investor alone is also responsible for the secure storage of the private key of its wallet necessary to receive and dispose of tokens. The loss or theft of the Private Key is equivalent to the loss of all tokens assigned to the wallet.

Possible Ethereum Mining Attacks

Mining attacks may occur in blockchain included in Tokens Smart Contracts. These attacks include, but are not limited to double-spend, majority mining, selfish-mining, and/or race condition. Should any attack be carried out successfully, there will be a hazard on the operation, functioning and sequencing of transactions pertaining the Tokens, and of contract computations.

The possibility of Tokens becoming worthless

The Tokens may become worthless. The Company does not ensure the liquidity of Tokens and waives all responsibility or liability that may arise in relation to the market value of the Tokens, their price, selling, purchase, and/or the existence of any markets for the Tokens.

Highly Speculative Traded Price

In secondary markets, the value of the Tokens tends to be obscure and subject to speculations. Tokens have no link to the assets of the Company; what is more, they are not backed by tangible assets. Prices can drop or increase unexpectedly. The whole investment by a token holder could be lost, or, in extreme cases, Tokens could lose their entire value.

No-Refund of Tokens

No legal undertaking is implied by the Issuer to indemnify the Buyer against possible non-completion of the platform or delays in its completion.

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Legal Disclaimer

This White paper has been prepared for the purposes of providing information on the QARK token (QAN), its projected business model, and is solely for informational purposes, and expressly is not an offering of a financial investment. A purchase of QARK Token (QAN) involves certain risks, including the risk factors relating to purchase of any tokens, financial, tax, and technical risks. Each reader of the documentation provided by QANtum Global OÜ needs to make an independent assessment of the potential value of the content in order to determine whether to participate in any token sale. Risks associated with new technology and cryptocurrency tokens in general are a relatively new and untested technology. Due to this nature, technology-related unforeseen events may occur at any time. Participants comprehend and fully accept all types of related risks involved. Ethereum related risks to tokens issued on the Ethereum blockchain is thus being dependent on it.

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No representation or warranty is given as to the achievement or reasonableness of any future projections, estimates, prospects or returns contained in this White paper. Readers should not construe the content of this White paper, or any other communications by or on behalf of QANtum Global OÜ or any of its Representatives. Accordingly, each reader of this White paper should consult their own professional advisors as to financial, legal, tax and other matters concerning any potential participation in connection with the subject matter herein. Risks associated with regulation crowdsales and cryptocurrencies are to some extent currently unregulated. Regulatory authorities are carefully scrutinizing businesses and operations associated to cryptocurrencies in the World. Any person undertaking to acquire QAN must be aware that QAN business model may change or need to be modified because of new regulatory and compliance requirements from any applicable laws in any jurisdictions. In such case, Purchasers and any person undertaking to acquire QAN acknowledge and understand that neither QANtum Global OÜ nor any of its affiliate shall be held liable for any direct or indirect loss or damages caused by such changes. Neither QANtum Global OÜ nor its employees or collaborators assume any liability or responsibility for any loss or damage that would result from or relate to the incapacity to use the QAN, excepted in case of intentional misconduct or gross negligence.

Participation in the token sale

By participating in the token sale, the Purchaser represent and warrant that they understand the above legal notice and disclaimers, as well as they:

- are authorized and have full power to purchase QARK token according to the laws that apply in theirjurisdiction of domicile;
- are not a U.S. citizen, resident or entity nor are they purchasing or signing on behalf of a U.S. Person;
- lives in a jurisdiction which allows QANtum Global OÜ to sell the QAN through a crowdsale without requiring any local authorisation;
- are not acting for the purpose of speculative investment;
- will not use the QAN for any illegal activity, including but not limited to money laundering and the financing of terrorism;
- understand that QANtum Global OÜ is not responsible for any fiscal obligations of the Purchaser related to the acquisition of the QAN (whether VAT, income-related or other) and the Purchaser is solely responsible to determine what, if any, fiscal obligations (taxes) apply to any transaction you perform while purchasing QAN;
- understand that the purchase of QARK tokens is non-refundable
- are solely responsible for determining whether the acquisition of QAN is appropriate for them.

Investing into the Tokens involves risks. While every care has been taken to ensure that this White Paper presents a fair and complete overview of the risks related to the Company, the operations of the Company and to the Tokens, the value of any investment in the Tokens may be adversely affected by circumstances that are either not evident at the date hereof or not reflected in this White Paper.

This White Paper is prepared solely for the purposes of the Offering. This White Paper may not be used for any other purpose than for making decision of participating in the Offering or investing into the Tokens.

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