

INTRODUCING QUADRANS REV.02

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1 ABSTRACT

The first version of **QuadranS** blockchain was implemented in 2012 and has been successfully used to run business operations under the Foodchain brand.

During this journey, the experience gained by the variety of use cases and the expertise shared by businesses, institutions, government agencies and academic partners have contributed to the evolution of **QuadranS** technology.

QuadranS is an open-source, public, decentralized platform enabled by blockchain technology with the mandate to build a digital infrastructure that combines customizable data sharing, cryptography and smart-contract automation and establish a self-governed digital economy between businesses, institutions and individuals globally.

The aim of **QuadranS Foundation** is the research and development, promotion, education and support of the **QuadranS** blockchain, to enable a trusted and efficient communication network to facilitate the creation of global cross-industry standards and provide the digital fabric for the deployment of a new generation of decentralized applications (DApps) into the IoT system.

QuadranS keywords are cryptography, blockchain and smart contracts. Together they provide the building blocks of a new technological model based on a fair determination of the value attributed to all transactions including information acquisition, recording and transfer.

The new **QuadranS** ecosystem presents two types of cryptographic assets, which in blockchain terms are represented by Coins and Tokens. These have different functions in the platform and are comparable to Coins and Tokens that can be found in other blockchains.

QuadranS Coins (QDC) function as “gas” to run smart contracts and **QuadranS** Token (QDT) define the conditions of the participation to the network. Together, QDC and QDT are also used to upload and execute new smart contracts into the system.

QuadranS new distributed consensus protocol will significantly increase the system’s capacity to process larger volumes of transactions to achieve high scalability in a secure way and will reduce the power consumption required to solve complex algorithms at high speed, branding **QuadranS** a sustainable blockchain.

Quadrans ecosystem has been designed to mitigate potential oscillations of the QDC and reduce problems associated to its trend. The stable characteristic of the QDC will support the formation of a secure digital environment that enables users to draft reliable future financial plans.

The **Foundation** encourages users to join the network and provides guidance and full support to ensure a correct interaction with the system. Some of the incentives proposed by the **Foundation** include concessions for the upload of smart contracts and funding activities for projects of high interest for the community.

2 PREFACE

The **Quadrans Foundation** has combined the extensive competences of its members with the 7 years of research conducted by the Foodchain team for the development of the Foodchain platform – a blockchain project started by the **Quadrans** founding members in 2012 that grew into the company Foodchain SpA in 2016.

Today Foodchain successfully uses the first version of **Quadrans** blockchain platform for supply chains management within the Food industry.

Driven by the experience accumulated over the years and in collaboration with institutions, Government agencies and academic partners around the world, the **Foundation** commits to the development of a “Distributed Ledger Technology” model that will have the potential to change our lives and the society we live in.

From the very origin of this idea to current times, our vision has never changed:

Quadrans wants to be part of the transformation by building a public and distributed platform that provides the digital fabric to empower a reliable, transparent and trustworthy communication, supporting traceability and the establishment of global standards.

3 MISSION AND VISION

The **Foundation**'s mission is to develop and promote **Quadrans** platform for a trusted and efficient global communication, support research and education to foster decentralized protocols and tools that empower innovators to develop future applications and contribute to the creation of an inclusive, accessible and secure public network.

4 OUR GOALS

The purpose of the **Foundation** is to develop, improve and introduce **Quadrans** blockchain platform and promote its use to facilitate interaction between businesses, institutions and individuals, and support the creation of global standards beyond geographical boundaries.

Quadrans blockchain technology can be used to create a permanent, public, transparent ledger system for information and data management within the industry. The **Foundation** encourages enterprises from every sector to adopt and place **Quadrans** platform at the core of their business structure to bring growth and economic progress.

The **Foundation** is committed to advance **Quadrans** platform as the technology underpinning a trustworthy, transparent and collaborative system that runs a range of public services, including health records, land registry, e-voting and taxation.

Numerous experts and academics worldwide are involved in the research and development activities of the **Foundation** and support the use of **Quadrans** blockchain technology within educational institutions and communities where student records need to be secured and shared between parties.

The **Foundation**'s final goal is to lead the digital revolution by educating and encouraging widespread adoption of **Quadrans** technology to share information through the internet by connecting people and facilitating communication in all the aspects of our society.

5 RESEARCH

Quadrans Foundation will dedicate an extensive research effort supported by the contribution of a worldwide team of experts for the development of **Quadrans** platform. A period of research is expected to enable further enhancements of the platform and improve its characteristics.

The results achieved at the end of the research period will allow **Quadrans** platform to be deployed with all its innovative features, empowering a 360° use of the ecosystem.

Meanwhile, Foodchain digital properties will be gradually incorporated into **Quadrans** ecosystem to ensure a smooth and seamless transition into the final version of **Quadrans** platform.

6 FUNDRAISING

Thank to donations the **Foundation** will promote **Quadrans** adoption.

The research and implementation effort is supported by public or private organizations that want to contribute in pursuing the objectives of the **Foundation**. As a non-profit organization, resources and funds will be used to support the growth of **Quadrans** project and the activities involved.

7 QUADRANS GENESIS AND ARCHITECTURE

The **Quadrans** platform is an open source, public blockchain network that runs smart contracts and decentralized applications (DApps), in a new digital economy sustained by an internal reward mechanism.

A preliminary implementation of the main **Quadrans** blockchain features has been made under the Foodchain brand to run industrial activities to enable traceability, transparency and authenticity of information within Food supply chains.

Foodchain blockchain was born as a software fork of Ethereum blockchain and has been successfully used over the last years in the Food industry. The solid base and the expertise matured lead to the creation of a blockchain-based distributed certification technology designed to serve different industries.

Quadrans supports smart contracts compatible with Ethereum virtual machine (EVM) and will maintain full compatibility with the technology used by Foodchain. This allows a seamless and immediate transition of existing Ethereum-based solutions into the new **Quadrans** blockchain.

The development of **Quadrans** platform is conducted thanks the constant R&D activities of the **Foundation** with the contribution of great minds worldwide.

Quadrans ecosystem runs on two types of cryptographic assets that perform different functions within the network – these are represented as “tools and resources” and, in blockchain terms, are addressed as Coins and Tokens.

QDC are used as “gas” by the users and in combination with QDT to upload new smart contracts on **Quadrans** blockchain and sustain the computational effort required to execute them.

The function of running and verifying the smart contracts is performed by two different types of service nodes located throughout the network called “Masternodes” and “Miners”.

Masternodes handle inputs coming from the users and dispatch the computational work to the Miners, which permanently record the information into **Quadrans** ledger (further details will be reported in White Paper [1]).

QDC are mined every few seconds according to the amount of transactions defined by the mining algorithm. QDC will be generated every minute in the first year of operation and the mining pace will increase every following year to maintain a well-balanced ecosystem (details will be outlined in White Paper [1]).

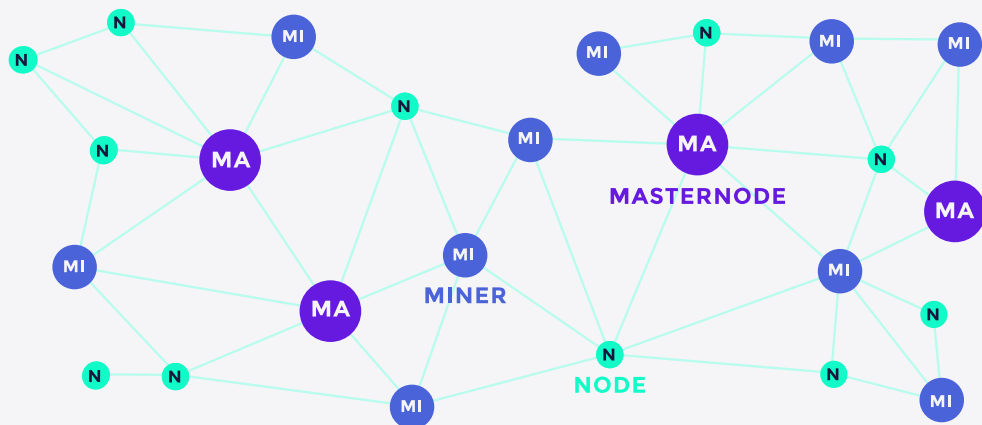


Figure (1): **Quadrans** Network

QDT are pre-generated as a fixed number of 600 million units. They are initially released into the network as well as assigned to public addresses of the network.

Given the limited number of QDT issued, assigned privileged actions will bring significant benefits in terms of scalability and sustainability to the blockchain infrastructure.

Quadrans has designed a new method for achieving the “consensus” in a highly scalable way. This significantly increases the system’s capacity to process larger volumes of on-chain transactions and handle a growing number of users without sacrificing security and decentralization.

QDT have a triple function:

- As a collateral for users that want to install Masternodes and/or Miner nodes.
- Enable the upload of new smart-contracts (in combination with QDC)
- Regulate the distribution of new QDC as a reward for the participation to the network

Most popular blockchains perform very energy-intensive operations in order to reach consensus and update the status of the ledger whereas **Quadrans** layered validation mechanism puts fewer elements in charge of the computationally intensive work reducing the power consumption required to solve complex algorithms at high speed, branding **Quadrans** a sustainable and energy-efficient blockchain.

The QDC has been designed to minimize the problems related to oscillations. The stable characteristic of the QDC will support the formation of a secure digital environment that enables users to make future plans based on accurate projections.

The upload of new smart contracts on **Quadrans** platform requires the involvement of QDT and QDC. The combined use of QDT and QDC will limit the overuse of the shared memory (“state”) of the network in an effort to reduce bandwidth and storage capacity required.

8 REWARD MECHANISM AND CRYPTOECONOMICS

Quadrans reward mechanism is designed to allow QDT holders, Masternodes and Miners to be rewarded for their service to the network.

All QDT holders are rewarded with a fraction of QDC that is proportional to the QDT held every time new QDC are generated.

The remaining fraction of QDC will be distributed between Masternodes and Miners (details will be outlined in White Paper [1]).

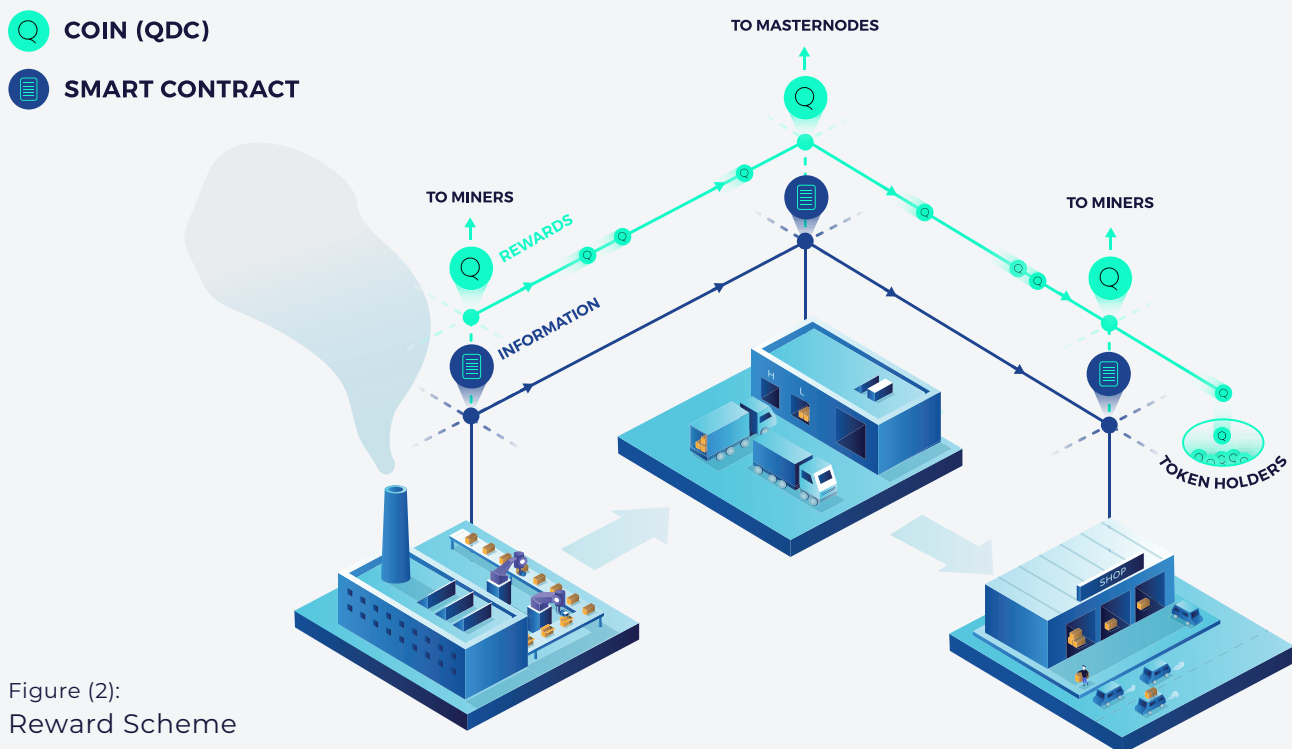


Figure (2):
Reward Scheme

The **Foundation's** team spirit is to build a well-designed digital platform for software that rewards the community according to a structure of incentive that encourages an ethic and virtuous use of the platform.

Quadrans network is open and public and anyone is able to upload new smart contracts into the system, as the word community is most meaningful when all participants are actively engaged.

The **Foundation** encourages everyone to join the network and provides guidance and full support to ensure a correct interaction with the system. Some of the incentives proposed by the **Foundation** include concessions for the upload of smart contracts and funding activities for projects of high interest for the community.

References:

[1] **"Quadrans"**, 2018, by *Davide Costa, Fabio Fiori, Massimiliano Sala, Alex Vitale, Marco Vitale*.

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