Bitcoin-based organizations

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ABSTRACT. The paper deals with the issue of creating a product to create organizations based on Bitcoin. The purpose of the work is to describe the tools for creating organizations based on Bitcoin, which can conduct their own activities in societies with a low level of trust. The theoretical basis is Bitcoin research, as well as frameworks that allow you to describe a company (SWOT analysis, mission, vision, values, goal setting and Value Proposition Canvas), as well as business process modeling tools, including BPMN. To solve the problem, methods of analysis and description of the tools needed to create a classical organization and an organization based on Bitcoin, a business process modeling method, as well as a synthesis method were used to combine the stages of creating an organization and applying Bitcoin tools. A study of the structure of the executive committees of local self-government bodies of large cities of Ukraine was carried out to determine the areas in which citizens are interested. Prototyping techniques were used to design a Web service to create organizations based on Bitcoin. As a result, areas were identified, the presence of public organizations in each of which will allow the formation of sustainable institutions of civil society even in a society with a low level of trust, and also, using strategic methods, areas of activity were identified that allow creating a greater number of organizations based on Bitcoin , as well as describe the potential costs of creating a product for the B2B market and designing a Web service for the B2C market.

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Introduction

A new type of technological stage [1] creates conditions for new forms of relationships, which opens up new opportunities both in the economy and in the development of society.

What tools correspond to the sixth technological stage? The start of the transition to the sixth technological stage corresponds in time to the dot-com bubble [2]. And the time of exhaustion of the instruments of the 5th technological mode in the sphere of finance can be called the global financial crisis of 2008. At the same time, the launch of the first decentralized currency, Bitcoin, in 2009 can be considered a manifestation of the sixth technological mode in the sphere of finance.

Bitcoin - opened the possibility of financial transactions outside the jurisdictions of states. Subsequently, cryptocurrencies began to allow not only the transfer of non-fiat financial values, but also the automation of decisions on their payment (so-called smart contracts, also smart contracts, i.e. contracts to fulfill the condition of payment of funds which is not decided by one particular person), this greatly increases the reliability of such contracts and trust in them. After all, especially for the first time, interaction with a new counterparty usually raises questions about its reliability.

The use of smart contracts - allows to transfer the trust, which was formed by the system of decentralized finance and its subsystem of decision-making on the provision of appropriate funds when these conditions are met, to the interaction with new counterparties. Which will increase the likelihood of decisions to interact and reduce the likelihood of disappointment in such a decision.

Yes, of course, using distributed finance does not remove responsibility from people for their actions, but it greatly reduces the cost of implementing this type of responsibility.

This form of payment is a popular tool for communities that require trust to achieve results. These are communities organized by the mechanism of freelance exchanges, as well as - societies with low levels of trust, as, in general, any community.

At the same time - freelance exchanges have management, interested in creation of tools, increasing trust between counterparties (service "safe deal", availability of fair arbitration, etc.), in developed societies - public management bodies and decision-makers also create mechanisms of high level trust (independent media, fair courts, performance ratings, open registers, etc.).

In societies with a low level of trust, usually the public administration and decision-makers are not interested in raising the level of trust, because an increase in this level of trust threatens their authoritarian power. Reducing the level of trust reduces the opportunities for the implementation of technologies of the sixth technological mode. And vice versa, the introduction of tools that reduce the cost of organizing processes with a high level of trust, allows the introduction of technology of the new technological stage!

A well-known tool to increase the opportunities for using new technologies in business processes is a framework - a described set of tools and principles that can be used to achieve this goal.

1 Bitcoin technology

1.1 History of Management

The history of management is the history of the development of management methods, which allowed to achieve sufficient results in management at each time stage, in each type of society, for each level of human development.

The sixth technological mode will correspond to a new type of organizations, which becomes possible to implement only in the technological package of the new mode.

Beginning with the management of slaves (unmotivated, unprofessional), the management of armies, the management of employees, the management of engineers, in each successive order, management methods have improved toward the possibility of managing processes in which more highly organized people are the basis. This is logical, because the technologies of each successive technological stage require people with a higher level of training.

All previous types of management had their advantages and disadvantages, but in general - they allowed to manage imperfect people with the presence of the manager. That is, the manager both set the rules and implemented them.

Stages of development of organizations are well described in the book by Frederick Laloux "Discovering the organizations of the future" [3]. [3]. "The stage of human development corresponds to "self-realization" according to Maslow and is called differently - authentic, integral or Turquoise" [3, c 51]. Organizations that stand at the highest level of development are called "Turquoise organizations" in this book. Frederick argues that the transition to trust as a method of management provokes a change in the structure of the organization: "Turquoise organizations, relying less on ego-driven actions, have a hope to say goodbye to a number of corporate diseases. More broadly, the very approach to power can be fundamentally altered. When fear is replaced by trust, can the hierarchical pyramid remain at the core of the organizational structure?" [3, c. 57-58]

We can conclude that turquoise organizations are characterized by the absence of a formal hierarchical structure, maximum transparency and greater freedom of employees in decision-making and self-expression. I.e. it is possible to tell that the organizations of the future described by F. Laloux have a high level of decentralization.

1.2 Trust

Trust is considered critical for the success of digital transformation initiatives. However, the concept of trust is complex and multidimensional, and its impact on digital transformation remains unclear.

In [Antonopoulos, Andreas M. Mastering Bitcoin: Unlocking Digital Cryptocurrencies. "O'Reilly Media, Inc., 2014. p. xiii], Andreas Antonopoulos expressed the idea that "Bitcoin is not money, but a decentralized network of trust." This idea is fully endorsed by the author of this study, making it extremely important to consider the concept of trust in this paper.

Trust is a multidimensional construct that encompasses trust in technology, trust in people, and trust in organizations. Trust in technology is associated with the reliability and

security of digital tools, trust in people is linked to the competence and moral behavior of individuals, and trust in the organization is tied to the vision and culture of the entity.

Based on the Edelman Trust Barometer report for 2021 [4], it can be concluded that trust in institutions has significantly declined over the past year, with governments being the least trusted entities worldwide. Conversely, trust in business remains stable, and technology companies enjoy the highest level of trust among industries. The report highlights the importance of strengthening trust between stakeholders and engaging with them on issues that matter to them. This is especially important in light of the COVID-19 pandemic, which has heightened public expectations for businesses to assume a more proactive role in addressing social and environmental concerns. As a result, trust becomes a pivotal factor in the success of organizations and must be earned through transparency, accountability, and ethical conduct.

1.3 Cryptocurrencies

There are numerous definitions of cryptocurrencies, and a comprehensive overview of existing definitions is provided in the study by M. A. Kutsevol and O. A. Shevchenko-Naumova. The researchers cited the perspectives of several other scholars and emphasized, "To date, there is no universally accepted concept of cryptocurrency worldwide. Therefore, it is crucial to examine the evolution of financial systems to gain a better understanding of how this paradoxical phenomenon came to be" [5]. Thus, it is appropriate to present the definitions that will serve as the foundation for this study.

In this paper, we will adopt the following definition:

A cryptocurrency is a digital currency supported by the infrastructure of blockchain technology, which utilizes a fully replicated and decentralized database.

Bitcoin, being the first and currently the most prominent cryptocurrency, holds the highest market capitalization.

Bitcoin is a cryptocurrency that functions on a peer-to-peer network, eliminating the need for intermediaries like banks or other financial institutions. Utilizing bitcoins provides numerous benefits, such as reduced transaction fees, faster transfers, and enhanced security.

One of the most significant attributes of Bitcoin is its capacity to generate and execute smart contracts.

Smart contracts, also known as SMART contracts, can be defined as a collection of programs that possess self-testing, self-executing capabilities, and are safeguarded against unauthorized access [6, p. 1].

The Lightning Network is a Layer 2 payment protocol that operates atop the Bitcoin blockchain and relies on smart contracts. As described in [7, p. 44], Bitcoin transaction scripts, which are regarded by some as an implementation of 'smart contracts,' facilitate settlements or enforce escrow services in systems lacking trusted storage until specific conditions are fulfilled.

The Lightning Network facilitates swift and cost-effective transactions by establishing payment channels between two parties. These payment channels enable instantaneous transactions with nominal fees and enable micropayments, which were previously impractical within the Bitcoin network.

Bitcoin and the Lightning Network enable a novel form of organization that functions within a decentralized and transparent network. Leveraging the capabilities of Bitcoin and the Lightning Network, this organizational model can establish a secure, efficient, and decentralized rewards and ratings system. Such a system can effectively incentivize and evaluate employees.

In general, the integration of Bitcoin and the Lightning Network presents a distinct opportunity to establish a novel form of organization capable of functioning in a decentralized and transparent fashion. This arrangement offers various advantages, including reduced transaction fees, expedited transfer times, heightened security, and an enhanced system for employee rewards and ratings, thereby improving overall efficiency.

As mentioned earlier, the Bitcoin infrastructure incorporates not just a payment function, but also a transaction locking function (smart contract). This implies that Bitcoin possesses the capability not only to transfer value between wallets but also to establish conditions for such transfers. For instance, envision a scenario where an entrepreneur places money on their desk, and that money autonomously moves into the employee's pocket upon completion of their assigned task.

In previous technological paradigms, this particular function was typically fulfilled by accountants. When an entrepreneur or manager made the decision to compensate an employee with a specific amount, such as wages or the payment for a contract, the accountant would record this transaction.

Decentralized financial systems enable the elimination of the need to make payment decisions after the completion of an employee's work; instead, these decisions are made beforehand. This approach enhances confidence in the organization as the employee is aware of the terms of remuneration, thereby increasing transparency regarding the requirements for their work.

1.4 Instruments of decentralized finance

We will examine the prevailing instruments of decentralized finance, specifically cryptocurrencies. In our research, we will concentrate on instruments that are built on Bitcoin, which holds the highest market capitalization and reputation.

1.1.1 What is a DAO?

A DAO (Decentralized Autonomous Organization) is a blockchain-based organization collectively owned and operated, with a shared objective [8][9]. DAOs enable collaboration with individuals globally, without the need to rely on a single decision-maker for fund and transaction management. There is no CEO who can spend funds impulsively or a CFO who can manipulate financial records. Instead, the organization's operations and fund allocation are governed by rules coded on the blockchain.

DAOs typically include built-in treasuries that require group approval for access, ensuring that no individual has exclusive rights. Decision-making is facilitated through motions and votes, ensuring that every member of the organization has a voice, and all actions occur transparently online.

1.1.2 Why do we need DAOs?

Establishing an organization where someone provides funding and capital necessitates a substantial level of trust in the individuals you collaborate with. However,

placing trust in someone you have solely interacted with online can be challenging. DAOs offer an alternative approach, as trust is no longer reliant on individuals within the group but solely on the DAO code, which is entirely transparent and verifiable by anyone.

This development opens up a myriad of fresh prospects for global collaboration and coordination.

1.1.3 **Bitcoin decentralized identifier**

A Bitcoin Decentralized Identifier (DID) is a distinctive identifier recorded on the Bitcoin blockchain, serving to authenticate and verify digital identities.

According to researchers Park and Nam, the Bitcoin decentralized identifier facilitates a shift in the identification model from a hierarchical system to a decentralized one. They state, "With the advent of blockchain (BC) technology, a decentralized identification (DID) model has been proposed as a replacement for traditional identification models reliant on centralized authorities" [10].

A decentralized identifier empowers users to possess the value generated by cryptocurrencies and engage in relationships facilitated within the cryptocurrency infrastructure.

1.1.4 Decentralized Rating System (DORSI)

DORSI, an abbreviation for Decentralized Open-source Rating System Incentives, is a system built on Bitcoin and the Lightning Network. It aims to establish a decentralized rewards and ratings system by leveraging the technology of Decentralized Identifiers (DID). The primary objective of DORSI is to develop a transparent and trustworthy platform for recognizing and evaluating the performance of individuals or groups across various domains.

DORSI utilizes the robust security and transparency of the Bitcoin blockchain, coupled with the rapidity of the Lightning Network, to facilitate swift, secure, and efficient transactions. By employing DID technology, DORSI establishes a decentralized identity system, enabling individuals or groups to maintain control over their identity and reputation while actively engaging in a rewards and ratings framework.

The DORSI system is open-source, allowing it to be utilized and modified by anyone. This fosters greater innovation and flexibility in system development, as well as enhanced prospects for collaboration among developers and users.

In essence, DORSI technology possesses the potential to revolutionize the management of incentives and ratings, offering a transparent and resilient system that is both efficient and secure.

The rating system will rely on an employee's performance in accomplishing assigned tasks within the task market. As an employee completes more tasks, their rank will ascend. This rank will be publicly accessible on the blockchain, establishing a transparent and decentralized method of evaluating employees.

The incentive system operates on a rating-based structure, where employees with the highest rank are rewarded the most for task completion. This fosters motivation for outstanding performance and career progression. Payments will be automatically computed and transmitted through Lightning Network smart contracts, ensuring a secure and efficient method of disbursing rewards.

To ensure the integrity and precision of the rating and reward system, the implementation of a reputation system can be considered. This reputation system would be founded on feedback from customers who have received completed tasks from employees. Customers would have the ability to rate the quality of the work performed, and these ratings would be openly accessible on the blockchain. The reputation score would then be factored into rankings and incentive calculations, fostering a culture of excellence and encouraging employees to consistently deliver high-quality work.

1.5 Capabilities of decentralized systems

Decentralized systems additionally facilitate process management and motivation setting without relying solely on charismatic legitimacy. Entrepreneurs can leverage the tools of decentralized finance to make decisions and articulate them, eliminating the need for extensive interaction with staff. By implementing predefined decision-making processes and evaluation criteria, entrepreneurs can effectively allocate their efforts.

Modern decentralized finance presents an opportunity to enhance trust through instrument ownership, analogous to providing collateral to a bank by a financially sound entity. Similarly, the role of arbitration fulfills this need by serving as a legal system that resolves disputes in favor of justice in cases of contract non-compliance.

This characteristic enables us to anticipate the suitability of decentralized finance systems in communities and societies with initially low levels of trust. In such contexts where conventional trust-building mechanisms like familiarity history, social class affiliation, or legal systems are ineffective (e.g., transactions conducted outside legal regulations, transactions with unfamiliar parties, transactions within societies or countries with low levels of trust), decentralized finance systems can provide valuable solutions.

2 Model development

2.1 Goals and objectives of the work

The aim of this paper is to outline the tools for leveraging decentralized finance systems based on Bitcoin to develop the fundamental business model of a company. These tools will enable the company to execute its operations and implement such models, even in societies with limited levels of trust.

Objectives:

1. Form the sequence of use of decentralized systems
2. Highlight the main requirements for the systems from their user.
3. Using business process description tools, we will outline the key steps that an entrepreneur needs to take in order to harness the potential of decentralized finance systems.
4. Develop a robust business model for a company that effectively implements decentralized financial instruments.
5. Design a product for B2B and B2C markets.

2.2 Creating an organization

Simplistic organizations rely on the use of force as a means of control. The establishment and operation of such organizations are maintained through physical dominance, where participants engage due to the absence of alternative options.

However, such organizations prove to be inefficient. Voluntary work and participation in organizations lead to higher levels of efficiency.

As the state emerged, the concept of ownership became formalized through registration in appropriate records. Property owners possess legal documents that validate their rights to control their respective assets. Similarly, organizations follow a similar mechanism, whereby the right to manage is established through registration in public registries.

However, until the need for property registration arises, we have no interaction with this system. When the need arises, we incur expenses to engage with the registration mechanism and fulfill the necessary actions for registration.

Interestingly, the process of working with the registration authority is independent and can be familiarized with even before the need for property registration arises.

For instance, when registering a legal entity, we must first familiarize ourselves with all the requirements and conditions set by the registration body. Subsequently, we need to fulfill these conditions, such as providing information about the founders, submitting the company's charter, and paying the required state fees.

2.2.1 Ability to register

The initial step is the option for registration. To start off, when establishing an organization, it is crucial to define the ownership structure, specifically the distribution of profit shares among the founders. These actions are not directly related to operational activities; rather, they solely establish the relationship between the owners and the company.

During this stage, all the required information is registered with the relevant registration authority, and the owners receive a document that validates their ownership. This document, which includes their identifiers, grants them the authority to manage the asset, the rights to which are registered with the governing authority.

2.2.2 Charter (documents of title)

The second step involves the creation of the charter (title documents). The same principle applies to any property: owners determine their respective claims on the asset. Once the ownership structure is established, it is important to outline how the organization will operate. Various terms are used to refer to the documents that describe this stage, such as a business plan, a strategic plan, or a business model, depending on the specific approach.

The essence of this process is to describe the key participants and their roles, which they must fulfill in order to achieve the desired outcome of the main process. The business model encompasses the principles for making significant decisions, including determining which decisions can be made unilaterally and by whom, and which decisions require the agreement of multiple participants in the process. It also defines the types of actions necessary to achieve the desired outcome. During the business model stage, actions may be taken, but they primarily involve the founders or individuals working for the project's profits. The model also aligns with the level of self-employment.

2.2.3Business model

The third stage involves the implementation of the business model. Once the business model has been formulated, described, and calculated, it is essential to integrate employees into it, ensuring their adaptation and involvement in the designed process to achieve results. An important aspect of this stage is the participation of individuals who are not the founders and therefore do not bear all the risks associated with the activity. In such cases, these individuals expect the organization to assume the responsibility of providing them with a predetermined fixed amount of compensation.

2.2.4 Connecting hired employees

The fourth stage involves the inclusion of hired employees. Gradually, the number of employees increases, and as in the first stage, the founders reach a limit in terms of the necessary decision-making. It is widely recognized in management theory that one person cannot effectively manage an unlimited number of individuals. This concept is known as the "norm of manageability." The norm of manageability refers to the maximum number of people who report to a manager or supervisor that can be effectively managed. (Cathcart, Deb, et al. "Span of control matters." JONA: The Journal of Nursing Administration 34.9 (2004): 395-399.)

11] If the norm of manageability is exceeded, it becomes necessary to involve managers. Managers require adequate autonomy within their areas of responsibility to

effectively carry out their work. The transition to multiple levels of management is typically seen in larger businesses, while a business organization with only one level of management is more characteristic of a microbusiness. This stage of organizational development can be referred to as the "delegation of authority" and aligns with the presence of a management board, a supervisory board, or both.

2.2.5 Delegation of authority

The fifth step involves the delegation of authority. Once the hierarchy of managers and employees is established, the next stage in organizational development is to assess the performance of each member and link incentives to their individual results.

This stage in the organization's development corresponds to the implementation of OKRs (Objectives and Key Results) and data-driven decision-making, also known as a data-driven approach. It is important to emphasize that the employees are the key driving force of the organization. To ensure that their collective efforts lead the organization towards desired outcomes, a comprehensive system of motivation is essential, wherein each participant in the process has their own incentivization component.

2.2.6 Motivation system

The sixth step is the motivation system.

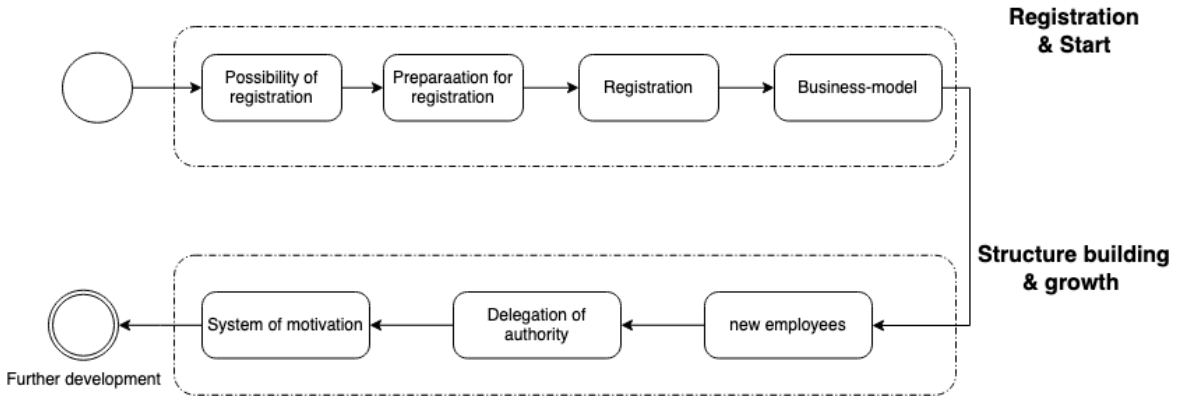


Image 1. Stages of organizational development
Source: in-house development

2.3 An organization based on Bitcoin

Let's examine the stages involved in creating an organization based on Bitcoin.

The first stage of creating the organization is setting up the operation of the Bitcoin network node controller. From a technical standpoint, this involves purchasing a server, ensuring a reliable internet connection, and installing the required software. This stage can be referred to as "Basic Server."

To enable the server to function as a Bitcoin network node, the following steps are necessary:

1. Install the program Bitcoin Core wallet c https://bitcoin.org/uk/download
2. Create a configuration file Bitcoin Core
3. Launch Bitcoin Core and wait for synchronization with the network.

At this stage, connecting the server to the Bitcoin network enables the creation of a Bitcoin network node. This node can later be used to establish management rules for the wallet associated with the server, utilizing SMART contracts. Additionally, it allows for the implementation of rules regarding money transfers using multi-signature functionality. Having a functional server enables the utilization of other essential software features required for the development of an organization based on Bitcoin.

The first stage involves establishing the technological infrastructure necessary to create an organization based on Bitcoin technology.

In the second stage of creating a Bitcoin-based organization, SMART contracts are developed. These contracts outline the operational rules governing profit distribution within the organization. The collection of SMART contracts that define the profit distribution from the organization's activities can be referred to as a digital charter.

The second step involves the establishment of a digital charter. Once the digital charter is formed, the operational rules can be added using SMART contracts. Additionally, decisions regarding fund distribution that require collective agreement among multiple team members can be implemented using multisignature technology.

During this stage, a decentralized autonomous organization (DAO) is formed, comprised exclusively of its founders.

The third stage involves the establishment of a decentralized autonomous organization (DAO).

The initial three stages of creating a Bitcoin-based organization enable the creation of a Bitcoin network node, the configuration of rules for distributing incoming transactions, and the establishment of rules for signing payments. These stages also define the decentralized organization's rules for its founders.

The subsequent stages of organizational development facilitate the inclusion of external participants into the existing organization. These participants join for their own individual purposes, rather than specifically for the development of the organization.

In the fourth step, we incorporate third-party participants into the organization by utilizing Decentralized Identifiers (DIDs) and establishing a database of digital identifiers for organization participants. The fourth step entails the inclusion of digital identifiers.

In the subsequent stage, with the creation of the database containing digital identifiers of organization participants, it becomes possible for registered users beyond the organization's founders to participate. Additionally, there arises a need to grant authority to these users, including the ability to manage processes. This is achieved through the addition of SMART contracts, which, in turn, enables the modification of the operational management of the organization.

The fifth stage involves the establishment of governing bodies within the organization.

A crucial element for the success of the organization is a motivation system where each member understands how their actions contribute to achieving the organization's goals (and is appropriately rewarded), as well as what actions hinder the organization's progress (and result in penalties or other negative consequences for those responsible).

To implement motivation in a Bitcoin-based organization, the organization utilizes a participant rating system that operates through DORSI (Decentralized Open-source Rating System Incentives) technology.

The sixth step focuses on the implementation of the rating system.

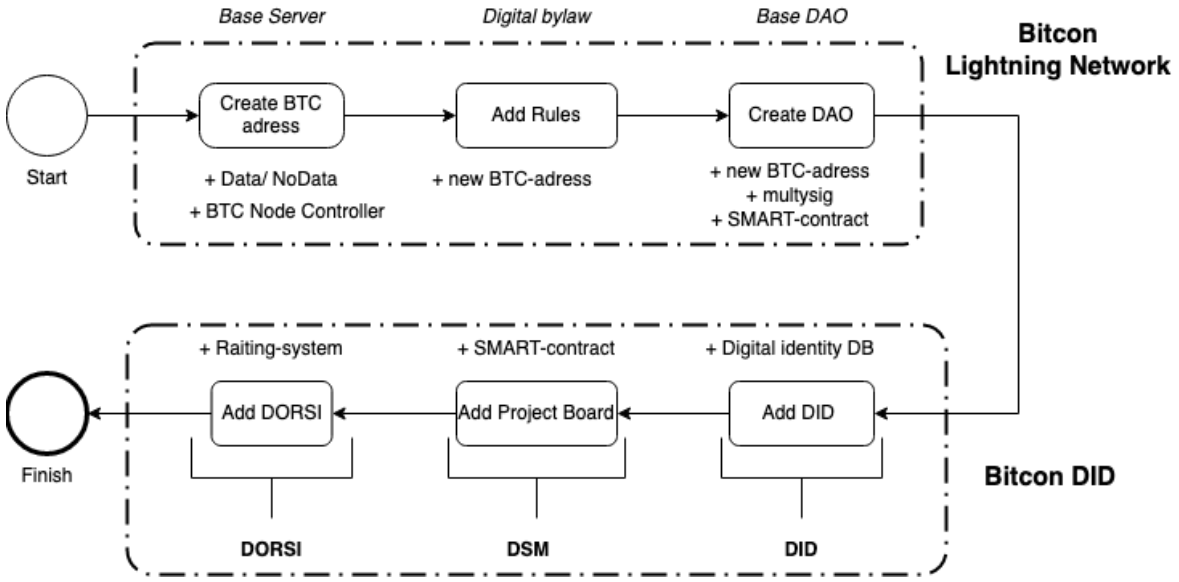


Image. 2. Stages of organizational development for a Bitcoin-based organization
Source: in-house development

We have outlined the key stages involved in creating an organization, as well as the technologies utilized in establishing a Bitcoin-based organization.

It is not uncommon to encounter situations where certain entrepreneurs grasp the overall organizational process but lack understanding of the technological aspects of a Bitcoin-based organization. Conversely, there are individuals who possess knowledge of creating a Bitcoin-based organization but have limited comprehension of the entire organizational creation process. Both scenarios can lead to negative experiences and feelings.

2.4 Distinctions of new organizations

Let's outline the distinctions between the new type of organization, specifically the Bitcoin-based organization, and the traditional type commonly found today.

№	Classic type	New type
1	Establishing an organization is a time-consuming process that involves preparing various documents across multiple entities. Additionally, opening a bank account is often required, which further adds to the waiting period. It's important to note that once your money is deposited in the bank, it becomes tied to that specific institution.	Setting up a business organization requires significantly less time and effort. The initial step involves choosing a jurisdiction, which can often be done online. Subsequently, all other tasks can be completed conveniently using your computer and an internet connection. It's important to highlight that your assets remain solely under your control, allowing for freedom of circulation and mobility.
2	Does not involve the creation of an anonymous organization	The ability to create organizations without being tied to a person, but tied to a goal.
3	In most cases, financial flows are managed by individuals, typically within the financial department of an organization. Automation, however, can be achieved through partnering with a financial institution (such as a bank) or by utilizing advanced software solutions.	Automating financial flows serves as a fundamental aspect of the new paradigm of smart contract-based organizations. Smart contracts, multi-signatures, and timelocks are all essential tools for enhancing processes and achieving automation.
4	The structure does not include the creation of a brand community, a community of like-minded individuals, or a closed club within the organization itself. Such endeavors are typically facilitated through external services or platforms.	The structure of a decentralized autonomous organization (DAO) always allows for the creation of a brand community, a community of like-minded individuals, or a closed club within the organization itself. Multiple internal structures of this nature can be established within the DAO format, and they will all operate as integral parts of the same organization.
5	Only general information about employees or project participants is available. The complete work history (CV) of new employees is not transparent, and the accuracy of their experience data is challenging to verify with 100% certainty.	Digital signatures and cryptographic history ensure accessibility, trustworthiness, and transparency, thanks to their implementation on the Bitcoin blockchain.
6	Task management is currently performed exclusively in manual	Task management is automated through the utilization of blockchain and smart contracts. The

	mode. Creating tasks, planning their execution, monitoring progress, and making payments all require human intervention. These processes lack automation, emphasizing the need for a skilled team to carry them out effectively.	onboarding process for a project can be initiated by a single individual. Additionally, payouts are automated, streamlining the payment process.
7	Incentives such as bonuses tied to salary or a percentage of sales are used to motivate employees. However, implementing a gamification approach with a bonus system is often challenging. The existing bonus-rating system is centralized and lacks transparency. It requires additional specialists or extra time to maintain. Furthermore, its impact on improving customer service is relatively weak.	Incentives are decentralized, automated, transparent, and linked to specific activities through programming. Active engagement within a project automatically increases the individual's rating without the need for human intervention. The concept of "win-win" is encouraged, where employees strive to maximize bonuses while delivering excellent customer service.

Table 1: Differences of the new type of organizations by main elements
Source: own development

3 Developing a product that introduces a new type of organization in low-trust societies using Bitcoin-based tools

In this section, we will explore the application of the developed model that utilizes the technical tools of the Bitcoin network to create a new type of organization. We will focus on two directions in which these technologies can be utilized: firstly, the use of organization-building technologies to foster the development of civil society through the establishment of non-profit organizations; and secondly, we will describe a commercial organization whose primary function is to provide technical and organizational support for the creation and operation of Bitcoin-based organizations.

3.1 Non-profit organizations

In societies with a low level of trust, the state (or, more precisely, an autocratic or totalitarian regime) assumes control over power. However, the establishment of individual public organizations does not systematically address the issue of building trust.

Furthermore, non-free regimes have no interest in the proliferation of numerous public organizations, as the emergence of alternative centers of influence in society may pose a threat to their power. In the absence of an independent judiciary and with power concentrated in the hands of a few, the state can easily obstruct the operations of an organization by revoking its registration.

Addressing the challenge of increasing societal trust can be viewed as a deliberate process that encompasses key aspects of society. Additionally, it involves employing public tools and initiatives that are independent of the existing state system.

In a country with a free regime that allows the registration and operation of public organizations, these organizations would utilize all the available opportunities within the legal framework, including regulations pertaining to cryptocurrencies. However, even if the regime attempts to obstruct the work of these organizations by revoking state registration and blocking financial accounts, they would still be capable of persisting and functioning within the country despite the resistance from the regime.
Furthermore, this technology enables the establishment of civil organizations in closed societies, facilitating financial support for their participants in an anonymous and independent manner, regardless of the state in which they are situated.

To outline the functioning of public organizations, let us define their respective spheres. In order to accomplish this, we will conduct a study of local self-government bodies in Ukraine. Additionally, we will follow the sequence of creation outlined in the relevant research by M.S. Maximov [12].

Therefore, it is necessary to develop value propositions for each direction and establish a coordination system. As the foundation of the societal structure, we will consider the list of local government departments in major cities of Ukraine, including Kiev, Kharkiv, Odessa, Dnepr, and Lviv.

Direction of activity	Title
Social policy	Department of Social Policy (Kyiv, Kharkiv, Dnipro) Department of Labor and Social Policy (Odessa) Social Protection Department (Lviv)
Health Care	Department of Health (Kharkiv, Kyiv, Odesa), Department of Public Health (Dnipro), Health Care Administration (Lviv)
Education and Science	Department of Education and Science (Kyiv, Odesa), Department of Education (Kharkiv), Department of Humanitarian Policy (Dnipro), Department of Education (Lviv)
International cooperation	Department of International Cooperation (Kharkiv), Department of Culture, International Cooperation and European Integration (Odesa), Department of External Relations and Promotion (Lviv)
Culture	Department of Culture (Kharkiv, Kyiv), Department of Culture, International Cooperation and European Integration (Odesa), Department of Humanitarian Policy (Dnipro), Department of Culture (Lviv)
Housing and Communal Services	Department of Housing and Communal Services (Kharkiv), Department of Housing and Communal Infrastructure (Kyiv), Department of Housing and Communal Services (Dnipro), Department of Housing and Infrastructure (Lviv)
Infrastructure and Transportation	Department of Infrastructure (Kharkiv), Department of Transport Infrastructure (Kyiv), Department of Transport, Communications and Traffic Organization (Odesa), Department of Public Works and Infrastructure (Dnipro), Department of Housing and Infrastructure (Lviv), Department of Urban Mobility and Street Infrastructure (Lviv), Department of Transport and Transport Infrastructure (Dnipro)
The Economy	Department of Economics and Municipal Property (Kharkiv), Department of Economics and Investments (Kyiv), Department of Economic Development (Odesa, Lviv), Department of Economics, Finance and City Budget (Dnipro)
Communal property	Economics and Municipal Property (Kharkiv), Department of Municipal Property (Kyiv, Odesa)
Land relations	Department of Land Relations (Kharkiv), Department of Land Resources (Kyiv, Odesa), Land Resources Administration (Lviv)
Administrative services	Administrative Services and Consumer Market (Kharkiv), Department (Center) for the Provision of Administrative Services (Kyiv), Department for the Provision of Administrative Services (Odesa), Department of Administrative Services and Permitting Procedures (Dnipro)

City finances	Department of Budget and Finance (Kharkiv), Department of Finance (Kyiv, Odesa), Department for Work with Local Budget Revenues (Dnipro), Budget Office (Lviv)
Youth and Sports	Department of Family, Youth and Sports (Kharkiv), Department of Youth and Sports (Kyiv), Department of Humanitarian Policy (Dnipro), Youth Policy Department (Lviv)
Municipal information	Department of Information and Public Relations (Kharkiv), Department of Public Communications (Kyiv), Department of Information and Digital Solutions (Odesa), Department of Local Self-Government, Internal and Information Policy (Dnipro), and Information Services Department (Lviv)
Legal support for the work of local authorities	Legal Department (Kharkiv, Odesa, Lviv), Legal Support Department (Dnipro)
Organizational work of local authorities	Department of Organizational Work (Kharkiv), Department of Organizational Work (Odesa), Department of Support of the Dnipro City Council (Dnipro), Organizational Management (Lviv)
Digital Transformation and the Use of Digital Technology	Department of Digital Transformation (Kharkiv), Department of Information and Communication Technologies (Kyiv), Department of Information and Digital Solutions (Odesa), Department of Information Technologies (Dnipro), Information Technology Department (Lviv)
Control	Control Department (Kharkiv), Self-Governance Control Department (Kyiv), Analytics and Control Department (Odesa), Audit and Control Department (Dnipro), Control Department for Implementation of Council Decisions (Lviv)
Registration	Registration Department (Kharkiv), Registration Department (Kyiv), State Registration Office (Lviv)
Beautification	Department of Urban Development (Kyiv), Department of City Improvement (Odesa), Department of Parks and Recreation (Dnipro)
Municipal security	Department of Municipal Security (Kyiv, Odesa)
Cultural Heritage	Department for the Protection of Cultural Heritage (Kyiv), Office for the Protection of Cultural Heritage (Dnipro)
Ecology	Department of Ecology and Natural Resources (Kyiv), Department of Ecology and Development of Recreational Areas (Odesa), Department of Environmental Policy (Dnipro), Department of Ecology and Natural Resources (Lviv)

Table 2.Names and directions of the departments of Kiev, Kharkiv, Odessa, Dnipro and Lviv

Source: [18], [19], [20], [21], [22], own development.

As a result, we will obtain the following guidelines for the work of local public organizations:

- Social policy
- Health Care
- Education and Science
- International cooperation
- Culture
- Housing and Communal Services
- Infrastructure and Transportation
- The Economy
- Communal property
- Land relations
- Administrative services
- City finances
- Youth and Sports
- Municipal information
- Legal support for the work of local authorities
- Organizational work of local authorities
- Digital Transformation and the Use of Digital Technology
- Control
- Registration
- Beautification
- Municipal security
- Cultural Heritage
- Ecology

3.2 The core business model of providing services to create a new type of organization.

Possibilities to increase the number of Bitcoin-based organizations

To create a description of the future organization, we partially utilize the methodology described in [13]. We employ the SWOT analysis framework, formulate the business DNA (mission, vision, values, and strategy), and develop the service description using the Value Proposition Canvas.

3.2.1 SWOT analysis

SWOT–analysis – it is a common tool for strategic analysis that assesses the external and internal environment [14].

Opportunities:
1. Create a service for the creation and management of Bitcoin-based organizations.
2. Serve as a contractor for organizations utilizing Bitcoin for their own services.

Threats:
1. Unregulated distributed finance.

2. Low level of trust in decentralized finance technologies.
Strengths:
1. Technical competencies in Bitcoin networking.
2. Organizational competencies in Bitcoin tools management.
3. Competencies in web application development.

Weaknesses:
1. Limited skills in marketing and sales in markets.
2. Lack of financial capital reserves.

The most promising direction (opportunities and strengths):
1. Development of a functioning model.
2. Search for an investor to bring the product to the market.

3.2.2 Mission, vision, values.

Mission: To integrate money distribution technologies into the operations of commercial organizations.

Vision: To establish an ecosystem that incorporates tools for building Bitcoin-based organizations and provides professional training for working with such organizations.

Values: Distributed money and teams, a distributed management model, customer centricity, implementation through training [15].

Strategy (sequence of stages):
1. Preparation of a working model.
2. Investor search.
3. Acquisition of the first order.
4. Creation of services.
5. Market dominance.

Objective for the near future: To develop a functional model of a Bitcoin-based organization based on the company's founders.

3.2.3 Value Proposition Canvas

Value Proposition Canvas – a marketing tool for developing proposals based on the needs of the target audience [16].

Target audience (TA): Closed organizations (closed clubs, condominiums, investment funds, etc.) that provide funding for projects.

Tasks of the target audience:
1. Fund collection.
2. Decision-making.
3. Allocation of funds to approved projects.

Behaviors of the target audience:
1. Utilizing various payment systems.
2. Paying taxes.

3. Documenting the decision-making process.

Potential benefits of the target audience (TA): Reduced costs associated with administering the organization's operations.

Pain points of the target audience:

1. Collection of payments in cryptocurrency.

2. Acceptance of participants through a decentralized identifier.

3. Distribution of finances based on decisions.

4. Exemption from taxes in most jurisdictions.

Benefit generators for the target audience:

1. A system that enables decision-making and fund transfers without the need for administrative staff.

CA service: web-service that allows you to attract participants to make decisions and distribute funds within the working organization with its budget.

3.3 Creating an organization that offers services to create Bitcoin-based organizations

The main type of organization we will utilize is a service that enables the creation and management of Bitcoin-based organizations.

This organization model can be considered in two formats: B2B and B2C.

In the B2B format, the service involves the creation of custom organizations based on user requests.

In the B2C format, it is a web service where users can create organizations and grant access to participants for their involvement in the organization's creation.

3.3.1 Product for the B2B market

To create a service it is necessary to design the interface, the server part and the database and the blockchain part.

The main functionality of such a system will be:

- **Setting up a foundational server -** technically ensuring the presence of a node in the Bitcoin network.
- **Preparation and establishment of the organization:**
- 1. Connecting the founders and facilitating their creation of BTC addresses.
- 2. Ensuring the validation of founders' decisions.
- 3. Establishing a basic organization wallet and drafting reasonable contracts based on decisions regarding the distribution of shares in the organization's management, prepared during the organization's preparation stage.
- **Participant onboarding:** Participants can join the organization by entering a unique code assigned to the organization. By inputting this code, individuals can become members of the organization.
- **Establishing a board:** Delegating specific powers to team members to facilitate management decision-making.

- **Rating system:** Developing evaluation principles within the organization to establish an indicative rating for all members of the organization.

To estimate the cost of creating the first order, let's describe all the stages of the Software development workflow[17]:

- Design and prototyping (20 hours)
- Design creation (40 hours)
- Creating FrontEnd (120 hours)
- Creating the BackEnd (80 hours)
- Programming the BlockChain part (60 hours)
- Testing (1 hour of testing per 2 hours of development): 160 hours
- Project management (1 hour of project manager for 5 hours of development): 64 hours.
- Project management (1 hour of project manager for 5 hours of development): 64 hours.
- Business analyst work (1 hour of business analyst work per 10 hours of development): 32 hours.

Total number of hours: 576.

Based on an hourly rate of $30 for a specialist's work, the estimated cost of this development would be approximately $17,280.

To account for potential problem situations, we will apply a coefficient of 3, assuming that all tasks will take three times longer than planned.

The initial customer will be the foundational customer. Upon completion of the first order, the company will obtain the technology required to create the corresponding product. Subsequently, it will be necessary to establish the appropriate advertising infrastructure (landing page, advertising) to promote the product.

After the development of 3-5 projects, the technologies for creating Bitcoin-based organizations will be refined, and valuable experience in supporting the functioning of such organizations will be gained. Subsequently, it will be feasible to establish a service that enables the creation of Bitcoin-based organizations using standardized solutions.

The decision to create a Bitcoin-based organization is inherently complex and may require existing organizations a significant amount of time to reach.

To effectively facilitate the "maturation" of existing and new organizations, it is crucial to develop tools within the service that support organizations from the initial idea stage to the point where the utilization of Bitcoin tools becomes justifiable.

Therefore, we specifically target the corresponding service towards organization chairpersons, including those overseeing public and non-profit organizations, as well as individuals planning to establish their own organizations.

Their main pain points revolve around decision-making rules, delegation, and employee evaluation. These are crucial management elements that a Bitcoin-based organization enables.

For the organization's chairman to effectively implement Bitcoin-based mechanisms within the organization, they must first successfully adopt these mechanisms themselves. To achieve this, we utilize suitable frameworks:

- Creating the organization - the core of the business model
- Adding employees - issues of adaptation and group dynamics, the theory of emotional intelligence

- Ongoing organization activities and delegation - Agile principles and Scrum framework.
- Evaluation system - approaches to using KPIs and setting OKR goals.

Ownership of the appropriate tools will serve as the broad foundation and cornerstone for the development of the service, with the organization creation tools on Bitcoin being the key element of the service's unique selling proposition.

To accomplish this task, it is essential to formulate offerings for both B2B and B2C clients.

3.3.2 Product for the B2C market. Prototypes

To create an appropriate product, we will prepare prototypes and describe the functionality of each element.

3.3.2.1 Server page.

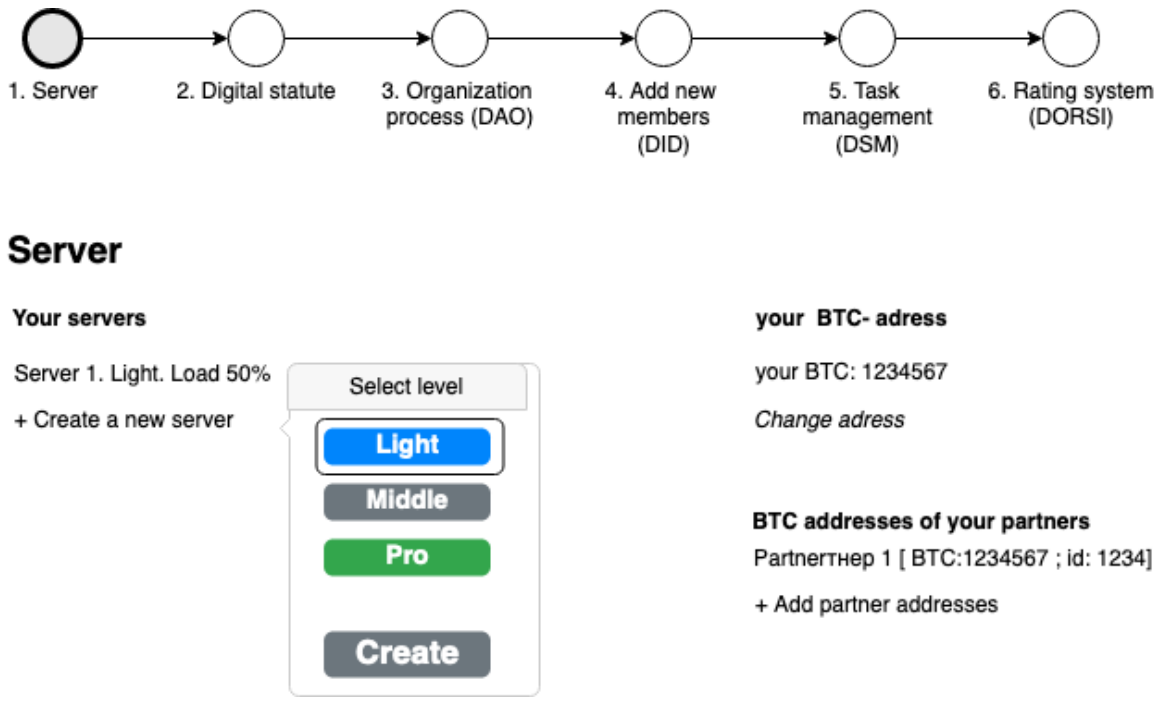


Image 3. Screen 1. Server
Source: own development

The functionality of the initial web application screen enables users to add a new server, resulting in the creation of a corresponding dedicated server. The user can choose from various server capacities, including Light, Middle, and Pro.

Additionally, on this screen, users can view their address in the Bitcoin network, modify it if needed, and add their own partners who can collaborate as co-founders of an organization that the user can create on subsequent screens.

3.3.2.2 “Digital Charter” page

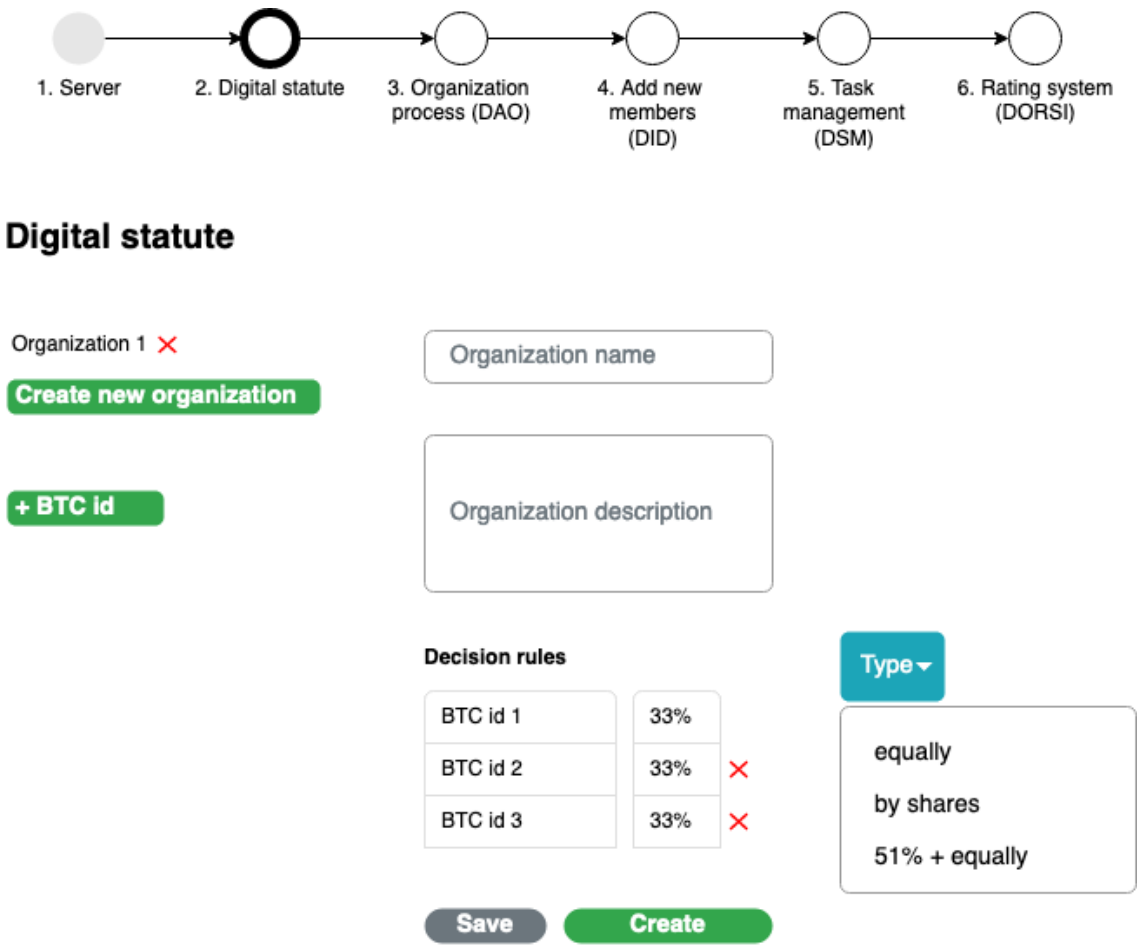


Image 4. Screen 2. Digital charter.
Source: own development

On this screen, users can create a new organization by providing a name and description. They can also connect co-founders to the organization, whom they previously added on screen 1.

Furthermore, on this screen, users have the option to adjust the decision weight, allowing them to modify the significance of the decision. Additionally, they can remove participants from the list of co-founders of the organization.

3.3.2.3 “Creating an organization" page

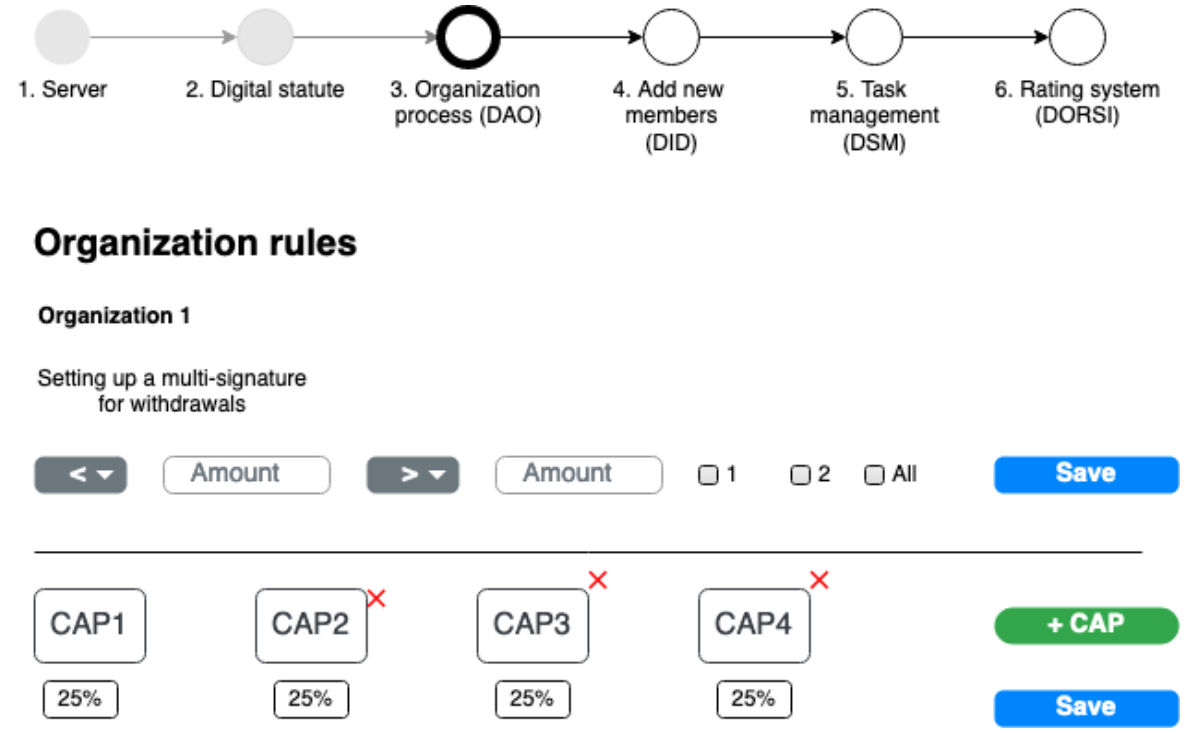


Image 5. Screen 3. Organization work
Source: own development

On the Organization Work screen, users can configure the multi-signature rules for transfer decisions and define the core treasury (CAP).

Multisignatures represent the transfer approval rules, specifying the number of votes required and the individuals involved in approving transfers from the organization's wallet, considering the transfer's size.

Treasuries (CAPs) are the funds used to allocate the income received into the organization's wallet. Users can add and remove CAPs (except for the first one) and adjust the proportion of income allocated to each CAP.

3.3.2.4 The "Connecting New Members" page

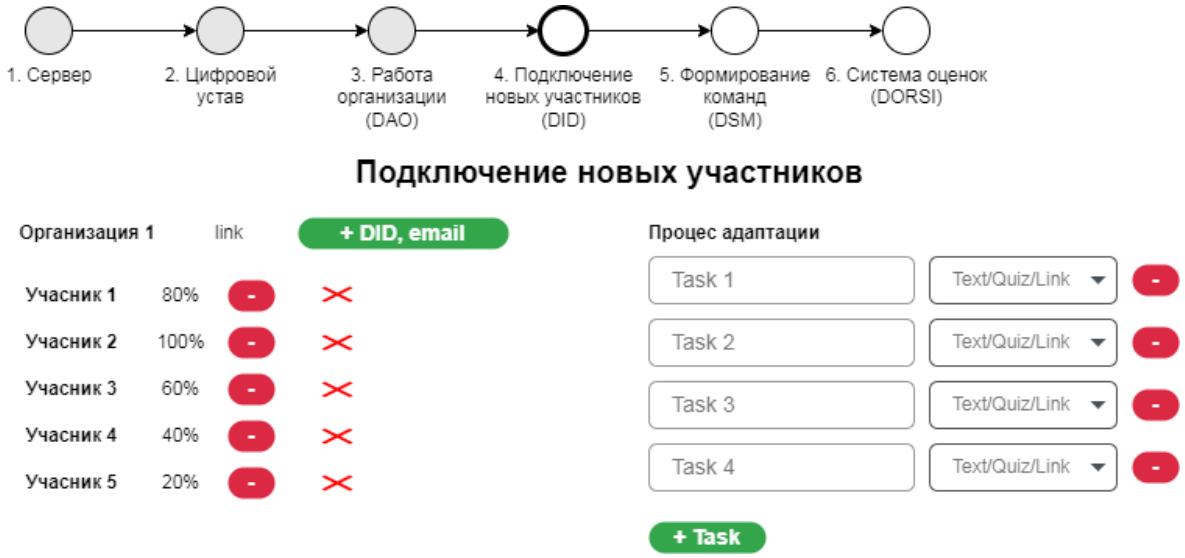


Рис. 6. Экран 4. Подключение новых участников
Источник: собственная разработка

On the Connect New Members screen, users can add members by entering their DID (Decentralized Identifier) and email. They can obtain a link to connect new members to the organization. Additionally, users have the option to remove a participant from the organization (with the possibility for the participant to reconnect using the connection link at a later time) or to block a participant (requiring reconnection solely through the organization's management interface).

Furthermore, on the Connecting New Participants page, users can configure the initial onboarding process for new participants. They have the ability to add and remove adaptation tasks.

Adaptation tasks can fall into three categories: text, test, and link. They can also include a descriptive text header.

In the list of all participants in the organization, the administrator can view the percentage of completed adaptation tasks. This percentage is calculated as the ratio of tasks that the participant has successfully completed to the total number of tasks required for new members when connecting to the organization's activities.

3.3.2.5 “Forming Teams" page

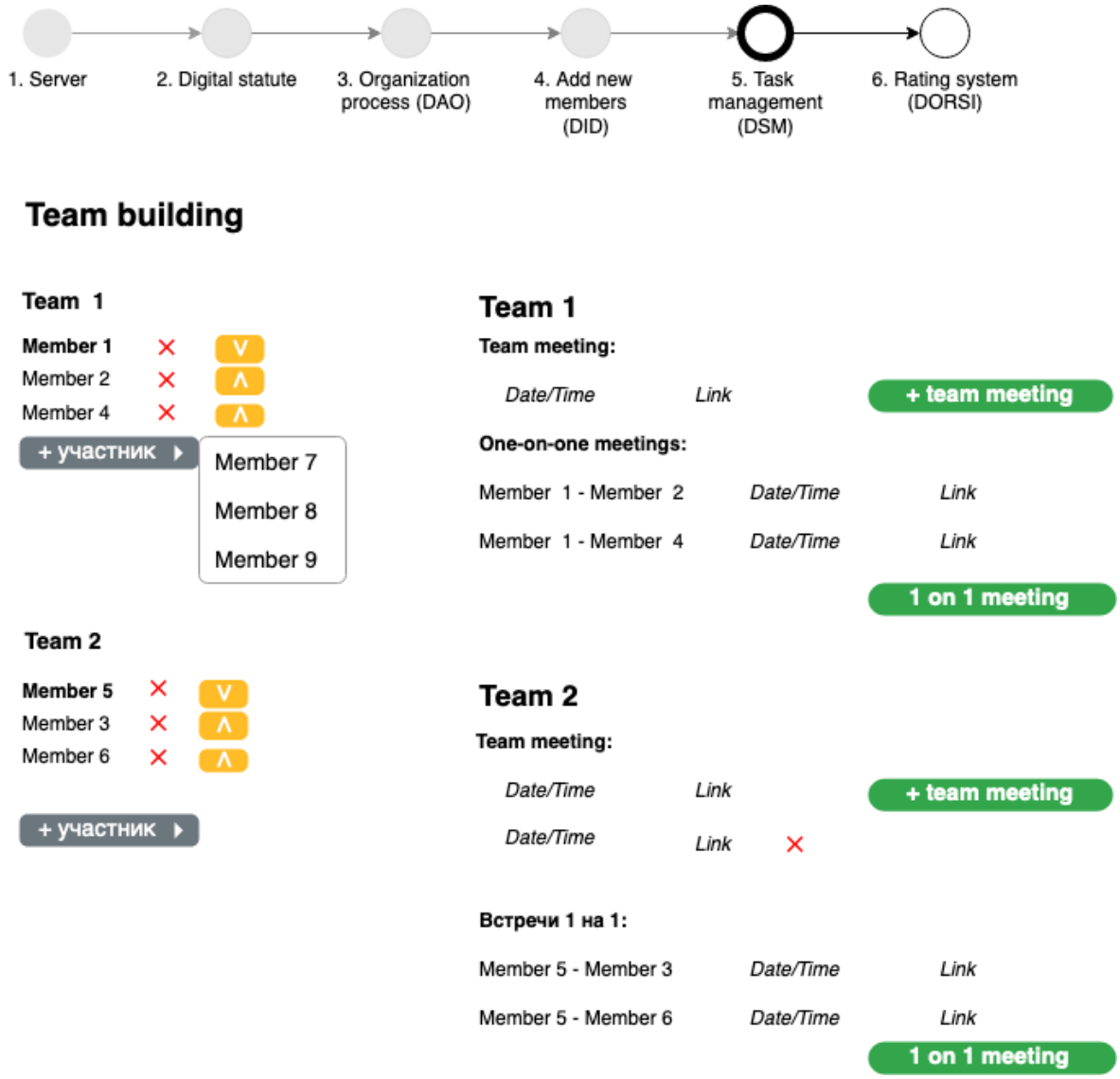


Image 7. Screen 5. Formation of commands
Source: own development

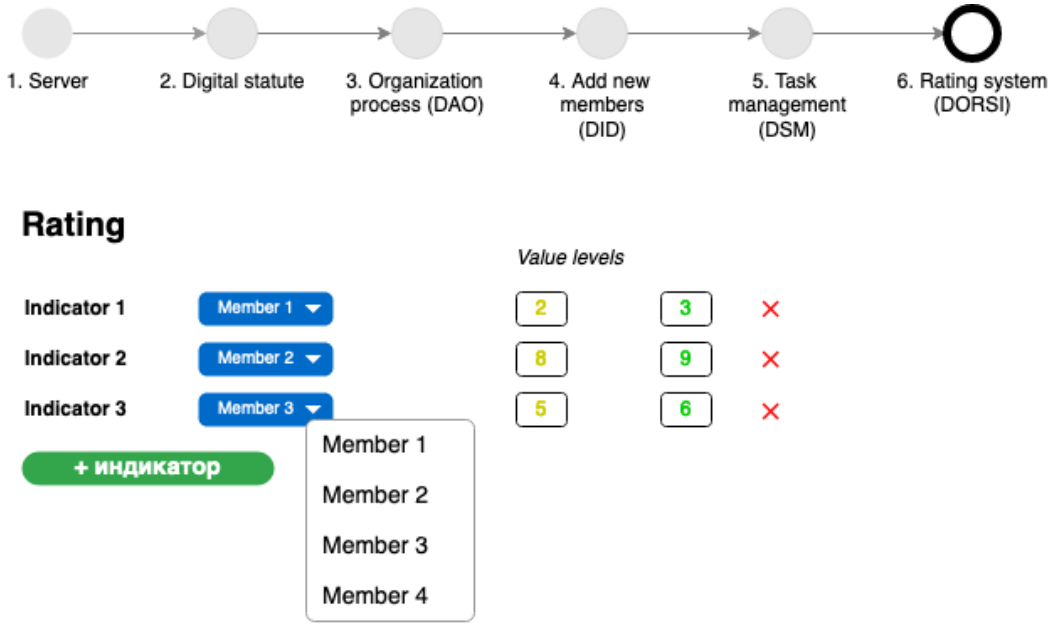
On this screen, existing members have the ability to form teams, add or remove members from a team, and designate or remove the team leader status from a member.

Using the list of teams, a meeting schedule is established. This includes a mandatory general team meeting once a week, as well as a compulsory meeting between the team leader and all team members at least once every two weeks.

Users have the option to add additional meetings, requiring input of meeting participants, day of the week, time, and the corresponding meeting link.

Additional meetings can be deleted, but main meetings cannot be deleted.

3.3.2.6 “Grading system” page



Dashboard							
	Account	Monthly plan	Plan forweek	Week 1	Week 2	Week 3	Week 4
Indicator 1	Member 1	12	3	3	4	3	4
Indicator 2	Member 3	36	9	8	6	9	10
Indicator 3	Member 4	24	6	5	6	7	6

Image 8. Screen 6. Grading system
Source: in-house development

On the "Rating System" screen, users can set performance indicators for each participant in the organization. They have the ability to add a participant and define the planned indicator, which represents the minimum desired result. Additionally, users can specify a partial indicator, which denotes a value between the planned indicator and the actual result, indicating partial fulfillment of the plan.

All indicators are compiled into a unified table (dashboard), displaying the responsible person, weekly plan indicators, and monthly plan indicators. The latter are calculated based on the original planned indicator.

Conclusions

By bridging the first and second paragraphs of this section, it becomes evident that the creation of a novel form of organization in low-trust societies requires the development of a software product that enables the design and management of such organizations using Bitcoin-based tools. Simultaneously, to ensure comprehensive coverage across all sectors of society, it is imperative to monitor the presence of these organizations in the following areas: social policy, healthcare, education and science, international cooperation, culture, housing and utilities, infrastructure and transportation, economy, communal property, land relations, and administrative services, urban finance, youth and sports, municipal information, legal support for local government operations, organizational management of local government, digital transformation and the adoption of digital technologies, oversight, registration, landscaping, municipal security, cultural heritage, and ecology.

The presence of organizations in all these spheres and the establishment of effective communication between them will enable the creation of civil society organizations capable of exerting systematic influence on public administration bodies within the country.

This approach provides a means for accumulating competencies outside of public administration, enabling quick responsiveness to emerging issues and fostering competition with public administration bodies in addressing citizens' concerns. Additionally, it helps establish a professional talent pool for public administration bodies and political life, consequently reducing the costs associated with power transitions resulting from elections.

The technical capacity to transition power without destabilizing state systems, facilitated by a sufficient number of skilled specialists and managers capable of assuming vacant positions in public administration, greatly enhances the competitiveness of the political and public sphere. This, in turn, elevates the quality of work carried out by state institutions within the country.

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