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Decentralised Autonomous Organisation (DAO) Business Model

Keywords: decentralised autonomous organisation (DAO); Blockchain 2.0; business model; business model canvas

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Abstract

Theoretical background: In general, the authors claim that the business model for any human-beings organisation defines who and how creates values in a socio-economic context. Taking into account the organisational theories presented in literature, authors notice a variety of definitions and components of business models. In addition, values in the business models have different interpretations. By definition, decentralised autonomous organisation (DAO) is using the blockchain 2.0 technology, which strongly supports its internal operational management, change of attitude towards organisation members' identification, and controlling internal activities.

Purpose of the article: Construction of the DAO business model for determining DAO strategic development is the main purpose of this study. The authors aim to provide their own proposal of business model, as well as the identification of DAO business model components. The authors expand the DAO business model canvas, and beyond variables included in Osterwalder's model, and consider some other important DAO features by example of TalentDAO case study.
Research methods: The authors have focused on surveys of the management science literature in some popular repositories. Beyond that, they have added a DAO case study. They have done descriptive analysis of publications on business models and DAO business models. The authors applied the case study approach, because they argue that each DAO is different and taking into account suggestions provided by practitioners, the exploratory case study method is the best method to reveal idiosyncrasy of business organisation as well as applicability of theoretical business models for practice of DAO management.
Main findings: Through the literature surveys, the authors concluded that selected theories in science of management are fundamental for DAO construction and applicable for development of business models. Although the reviewed models are various, they have many common features and allow constructing the authors' model of DAO business, which is an extension of Osterwalder Business Model Canvas. The authors characterised DAO partners, customers, values, resources, and activities. They discussed constraints and risks of DAO activities as well as the applied methods of coordination and control. The authors claim that DAO supports decentralized decision-making and intra-organizational trust intensification. They argue that the case study on DAO business model is an exemplification, which can be useful for development of other similar DAOs.

Introduction

Virtual organisations can apply the distributed consensus technology, in which network members come to an agreement on the state of a distributed ledger. It is a set of rules and procedures that allow maintaining a coherent set of principles respected by multiple participants. Decentralised autonomous organisation (DAO) is based on distributed ledger technology (Faqir-Rhazoui et al., 2021). The goal of this paper is to propose the business model of DAO. The model is to explain how DAO is operating, what values the organisation provides, by whom, to whom, and how and in what socio-economic context (De Rossi et al., 2020). Generally, DAO is a temporal organisation, whose members coordinate their activities through financial composability, progressive democracy, and transparency (Aseem & Iman, 2022). In this paper, the authors argue that DAO is a virtual organisation developed in the blockchain system, which is managed by smart contracts, without central management. In this virtual organisation, change proposals are democratically voted and approved, as well as automatically implemented in a transparent manner. The DAO blockchain mechanism allows for change of coordination, control, and governance. The meaning of decentralisation of decision-making, disintermediation, and management using blockchain are subjects of this study. The authors want to emphasise the leadership characteristics and decision-making models in DAO.

The paper consists of two main parts. The first part covers results of literature survey, while the other includes description of the main feature of exemplar DAO in the case study research. The authors have formulated three research questions, i.e. How can DAO be defined in the context of organisational design theory? What

business models support the DAO modelling? What business models are included in the DAO literature surveys? Answers to the first two questions are located in the literature survey. Answer to the third question has been received through the literature survey and case study. Authors have reviewed the following repositories: Scopus, Association for Information Systems electronic Library (AISeLib), PubMed, Social Science Research Network (SSRN), Sage Journals. The searching phrase: "Decentralised Autonomous Organisation" AND "business model" allowed receiving 1,488 publications. Paper sources and time of release were not limited. Articles were identified and screened for relevance through abstract, keywords, and title. Next, 763 articles were evaluated, basing on abstract and title review, as unsuitable for this research and excluded, because of lack of access to the full paper contents and impossibility to uncover the paper value. Hence, 725 full article papers were reviewed. However, that number of papers was reduced, because many of them were not strictly about the DAO. In the next step, 628 papers were studied, but many of them were removed because they included very general explanations of DAO model. They have not covered considerations on background theories, nor on DAO application in business practice. Eventually, 97 papers have been evaluated as important for studying blockchain (BC) technology, DAO development and governance, organisational theory, and domain application of DAO. Next, a literature survey on DAO and DAO case study allowed for development of business model and final concluding.

In general, researchers use case studies to describe phenomena, recognise special features of research objects, or get in-depth understanding of a particular social or business unit, how things work and why in a specific context (Russell et al., 2017). According to Yin (2002), case study is to provide a judgement. He distinguished some types of case studies, e.g. explanatory, exploratory, and descriptive case studies. Generalisation through case studies is not done in the same ways as in research based on the statistical method application. Yin (2014) has emphasised that, in the aspect of generalisation, case studies are similar to experiments, hence they are generalizable to theoretical propositions. Case studies are applicable to expand theories. The case study concluding is based on various sources of evidence, e.g. business demonstration, archival records, interviews, unpublished internal papers, direct observation of researchers, or a business process participant observation. The research case study can be applied as evidence to convince other managers or academicians of the applicability of a particular business model or an organisational theory (Myers, 2014).

Literature survey on DAO theoretical background

DAO as a virtual organisation

DAO is defined as a business organisation that operates through smart contracts on a blockchain network and allows its members for decentralised decision-making (Banaeian et al., 2023). The smart contract is a software for controlling and recording of DAO member actions (Glaser et al., 2019; Swan, 2015). DAO internal coordination is ensured by self-executing rules (Hassan & De Filipi, 2021). DAO governance means self-organising, peer-to-peer control, transparency, cryptographic security, and autonomous work of organisation members (Santana & Albareda, 2022). Autonomization concerns behaviour of DAO members, who are independent in their individual tasks realisation, but their mutual transactions are transparent and controlled by other peers in the chain. For Van Lier (2019), autonomy is a state of being self-governing, as well as an ability to operate independently of others. Burkhardt et al. (2021) identify autonomization with self-determination of goals and self-organisation of processes. Pańkowska (2007) argues that virtual organisation is intelligent (i.e. knowledge-based), *ad-hoc*, decentralised, temporal, post-modern, heterarchy-oriented, dispersed, open, heterogeneous, network, innovative, limited trust, and institutionalisation-directed organisation. Business units of virtual organisation are highly specialised and that specialisation allows them to be temporally available for particular tasks. They are autonomous, but mutually communicate. According to Reihlen (1996), heterarchies are pluralistic organisations, which are based on initiatives of their members. Heterarchies allow for equal participation of all organisational members in solving problems. Heterarchy management is based on the principle of dynamic leadership, i.e. business members take over responsibility for decision consequences according to their tasks and initiatives. Those characteristics permit DAO to treat as a virtual organisation. A similar conclusion is formulated by Zichichi et al. (2022). DAO members are working according to accepted rules and principles of trust and cooperation. They use governance tokens to participate in decision-making processes through a voting system (Raja et al., 2023). In DAO heterarchy, coordination is based on de facto standardised processes and contracts (Hsieh et al., 2018). There is no separate central management layer, which constitutes the highest level of power in the system. In heterarchy, such as DAO, a multi-chain architecture can be applied. There are business activities and transactions, which are realised outside the main chain. According to Hwang et al. (2018), a multi-chain is a transaction model consisting of the main blockchain and several side chains. This approach allows to speed up transaction processing as well as realise cooperation with various partners assigned to separate chains.

Theoretical background of DAO

As in DAO, all the members are permitted to have access to all processes and transactions in the organisation, all fully participate and work together, and each of them can be an initiator of a change. The theories of DAO should include their features and provide a framework of actors' behaviours, responsibilities and relationships among them (Daft, 2010). The organisational theories are valuable, because they provide an explanation of what happens when new technologies come to business organisations. Daft (2010) argues that organisational theory is a way of thinking to improve organisational quality, effectiveness, and efficiency. Hence, theories suitable for explaining DAO development are as follows: Economic Network Theory (ENT) (Swan, 2019), Game Theory, Transaction Cost Theory, Agency Theory and Sociomateriality Theory. Swan (2019) argues that the ENT is an application of graph theory methods to model pairwise relations between social entities and their interactions. The Game Theory considers agent behaviour in a situation of limited information and imperfect competition. In strategic interactions of many agents, individual results depend on the agent's decision as well as on decisions of other agents in that game (Tumasjan & Beutel, 2019). Transaction Cost Theory provided by Williamson (1985) emphasise some governance problems, i.e. bounded rationality of decision-makers, frequency and atmosphere of transactions, asset specificity, information asymmetry, agents' opportunism, and small number of transactions, which can create opportunities for domination of a few people on the market. Transaction costs will be reduced through elimination of these problems or reduction of their impact on an agent's decision. DAO contracts and particularly blockchain smart contracts facilitate transactions among agents in DAO. Agency theory concerns agents' cooperation in a distributed computerised network, which reduces agent's self-interest, and forces them to be under peer-to-peer control, while sociomateriality theory explains that DAO agents are interlocked in computerised ecosystem to act without human intervention (Ahluwalia et al., 2020). Adner (2017) defines the ecosystem by the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition. The alignment structure is defined as the extent to which there is mutual agreement among the members regarding positions and flows.

Blockchain as technological background of DAO

Generally, a blockchain is an incremental list of records named blocks, which are connected together, secured using cryptography, and forming a chain in the process. In the distributed organisations, the chain copies are stored in the nodes of networks, hence the network peers can review the chain and its contents (Banaeian et al., 2023; Parizi et al., 2018). According to Glaser et al. (2019), blockchain is a distributed database without a central authority that validates transactions among

the dispersed organisation peers. The term "distributed ledger technology" is often used interchangeably with a blockchain and as such it tracks changes to data and ensures its consistency through a consensus mechanism among organisation peers with potentially conflicting interests (Sullivan & Burger, 2019). In computer science and information processing, a transaction is understood as a series of operations that form a whole for an information repository, i.e. a database or a file system. If a series of operations occurs entirely, then the transaction succeeds, but if not at all that is, the transaction fails. Each transaction is digitally signed to ensure its authenticity and integrity (Hong Hin, 2019). Asadi et al. (2023) argue that blockchains is a decentralised, distributed, and transactional database technology that is shared within partners of virtual organisation, empowering the secured exchange of cash, resources, and data by means of the Internet, without any external mediations, e.g. by a bank. Boulos et al. (2018) argue that blockchain decentralisation supports a resistance of system failures, attacks, manipulations as well as the DAO participant collusion. In blockchain organisations, the transactions are verified and registered by every peer of the network. They are transparent and create an immutable sequence of recorded events, whose veracity is provided by a consensus protocol (Lopes et al., 2019). Beyond that, in blockchain organisations, the voting mechanism is important for election of any certain entities, and it is the fundamental on-chain decision-making application. Electronic voting system in blockchain organisation ensures authenticity, anonymity, integrity, auditability, transparency, and recoverability of voting actions (Akyuz & Gursoy, 2020; Clohessy et al., 2019; Lopes et al., 2019; Ray, 2023). Each user in the decentralised distributed organisation is identified by a public key, which can be accessed by the user's own private key. The voters' anonymity is ensured by the vote encryption. Each vote is not adulterated, it is verifiable, transparent, and auditable by each node in the network. Data stored in the blockchain cannot be deleted, hence recoverability is always possible. In 2008, Bitcoin was the first application offering digital cash and using blockchain technology (Blockchain 1.0) and consensus mechanism named proof-of-work. In 2013, Ethereum developed Blockchain 2.0 including smart contracts and tokens. The last generation, i.e. Blockchain 3.0 covers decentralised applications, i.e. dApps (Du et al., 2023). Although blockchain systems support effective data management, security of transactions, performance and quality of internal transactions, or even business sustainability, there are many obstacles of the BC usage, e.g. heavy investment in hardware and in software, complexity of technical solutions, scalability challenges, financial constraints, lack of knowledge, selfish mining, and hesitation of that new technology (Asadi et al., 2023; Attaran & Gunasekaran, 2019).

The blockchain technology provides some unique advantages (Hacker et al., 2019, p. 4). It is resilient, because if one copy of the blockchain is erased or damaged, there are many other copies of nodes that continue to provide the relevant information. Secondly, it is highly tamper-resistant, because new information can only be added by specific nodes and accepted as valid by the other nodes. Going backward

in the chain, the blocks of information are linked to one another so that information already recorded in the chain cannot be altered without changing the entire chain. And, a blockchain is censorship-resistant. There is no central authority that could block any information. Behaviour in a blockchain is regulated by the market (Tasca & Pisalli, 2019, p. 32). The transaction fees determine the behaviour of the network members; the elevated costs of verification of a transaction through the appropriate mechanism bring the blockchain participants together. The infrastructure, which supports the blockchain network does not belong to anyone, there are no property rights in it. The asset software is freely available online and the contract is written in the language of the code. The assets, i.e. cryptocurrencies and tokens, which are stored in the system, are the network members' property. The fundamental role is played by the social forces involved in the promotion of a project, i.e. founders, developers and users, which eventually decide the internal operational and organizational rules. Although a blockchain system is hard to compare to a company, due to the absence of unified management and coordination, all the subjects which form a blockchain are stimulated by individual reasons and conduct themselves opportunistically. Developers and miners of a blockchain system seek to maximize profits. Project developers and promoters are often motivated by the desire to maintain or increase their own political power within the system. Lianos (2019, p. 331) argues that the development of the IoT, smart property and artificial intelligence provides the possibility to automate the business organizations and their processes, additionally blockchains and smart contracts make automated that activities that were previously undertaken by human acting as intermediaries, e.g. controlling, supervisioning. This may give rise to shifts to micro-transactions, which may be executed automatically, through some form of decentralized autonomous organization.

The values of the product (i.e. the blockchain) do not always depend directly on the number of adopters, but on the adoption of some complementary products that are bundled or packaged with the first product. Both users and app developers may switch more easily to competing platforms. In the blockchain, the lower entry costs and the reduced significance of network effects have the potential to lead to less concentrated, more contestable (low entry/exit costs) markets. In the context of blockchain, the crucial issue is not the data as such, but the transaction that has been incorporated in the blockchain (Lianos, 2019, p. 350). There are some disadvantages of blockchain technology. Blockchain consists in combining code that is open source and could be easily replicated by competitors. The technology does not enable the development of mechanisms isolating the incumbent from actual or potential competition. For sustainable strategic advantage, economic actors should adopt tasks in complementary spheres or markets that will be strategically linked with the blockchain technology.

Literature survey on business models theoretical background

Discussions on the DAO business model should be started from defining the business model. Generally, a model is considered as an abstract representation of a real object. The measurable object features are identified for further analysis, measurement, and prediction of the object behaviour. Dietz (2006) noticed that model definition depends on its application. Business organisations elaborate their models for strategy implementation, visualisation of ideas, emphasising the respected values, and visions' presentation. Business model is a recipe, a pattern, a map or a guide of actions. Von See et al. (2021) declare that business model is "the architecture of the value creation process that aims at generating benefits for customers and value-added partners and based on that the model to achieve revenue" (p. 3). Model is a framework for sharing concepts and for revealing relationships among them (Jonker & Pennink, 2010). Chesbrough et al. (2013) claim that through the business models, an organisation is able to answer the questions what the firm wants to sell (WHAT), who is the customer (TO WHOM), how to combine human competencies and business capacities to provide products and services to customers (HOW), and what financial resources are needed for business processes' realisation (HOW MUCH). Authors of this contribution argue that the list of concepts can be expanded to include identification of risks, constraints, requirements, principles, drivers, and technologies.

The literature survey permits summarizing the business model concepts, which are pillars, or components of social organisation strategy. Table 1 includes various propositions of identification of these components.

Table 1. Business model concepts in chronological order and according to authors

Business model concepts	Authors
Concepts: operating processes, management systems, organisational structures, corporate culture, customer value, customer benefit, infrastructure, environment	(Treacy & Wiersema, 1997)
Concepts: business activities, potential benefits, revenue sources, marketing strategy, marketing mix, product, market, strategy	(Timmers, 1998)
"Structure in fives" model including the operating core, strategic apex, middle line, technostructure, and support staff	(Mintzberg, 1983)
Value chain model including primary activities (i.e. inbound logistics, operations, outbound logistics, marketing and sales, services) and support services (i.e. firm infrastructure, human resources management, technology development, and procurement)	(Porter, 1985)
Concepts: core strategy, strategic resources, customer interface, value network	(Hamel, 2000)
Concepts: revenue sources, value proposition, delivery model, funding model, assets, capabilities, relationships, knowledge, customers	(Linder & Cantrell, 2000)
Concepts: customer value, scope, prices, revenue sources, connected activities, implementation, capabilities, sustainability	(Afuah & Tucci, 2001)
Concepts: actor, value object, value port, value interface, value exchange, value offering, market segment, composite actor, and value activity	(Gordijn & Akkermans, 2001)
Concepts: brokers, buyers, sellers, transactions, broadcaster (web page), services, data, consumers, infomediaries, retailers, manufacturers, affiliates, revenue	(Rappa, 2001)
Concepts: value proposition, marketplace offering, resource system and financial model	(Rayport & Jaworski, 2001)

Business model concepts	Authors
Concepts: consumers, customers, allies, suppliers, flows of product, information and money	(Weill & Vitale, 2001)
Concepts: value proposition, market segment, structure of the value chain, position in the value chain, cost structure	(Chesbrough & Rosenbloom, 2002)
Concepts: customer, competitors, offering, activities and organisation, resources, factor and production inputs, suppliers and managerial processes	(Hedman & Kalling, 2003)
Concepts: customer, value, money, activities (i.e. making and selling)	(Magretta, 2002)
Concepts: infrastructure management including capability, resource, partnership, agreement, value configuration, and activity; product including value proposition and offering; customer interface including relationship, mechanism, channel link, and customer; financial aspects covering cost, profit, revenue, pricing, and account	(Osterwalder, 2004)
Model building blocks: key partners, key activities, value proposition, customer relations, customer segments, key resources, channels, cost structure, revenue streams	(Osterwalder et al., 2005)
Concepts: strategic choices, value network, creating value, capturing value	(Shafer et al., 2005)
Collaborative Commerce Marketplace (CCM) business model covering concepts as follows: emergent strategy, core business competencies, inputs (i.e. materials, tenders, contracts, people), outputs (i.e. products, services, tenders, contracts, suppliers)	(Seng et al., 2006)
Viable System model including primary activities (i.e. production) system, monitoring and communication (i.e. coordination) system, audit and integration system, planning and development system, policy and cohesion (i.e. coherency) system	(Yolles, 2006)
Model of customer value proposition, i.e. job to be done, profit formula is to define how the company creates value, (it consists of revenue model, cost structure, margin model, resource velocity), key resources (i.e. people, technology, products, facilities, equipment, and channels), key processes (including rules, metrics, and norms)	(Johnson et al., 2008)
Process-oriented business model: process, purpose & goal, strategy, key performance indicators (KPIs), stakeholders, process owner, roles, organisational units, resources (i.e. objects, technology, media), business rules, compliance	(Markovic et al., 2009)
Concepts: value proposition, value network, value architecture, value finance	(Al-Debei & Avison, 2010)
Business rule model including the following concepts: rules, activities, actors, services	(Zoet et al., 2014)
RACI model determining the actors who are responsible (R), accountable (A), consulted (C), and informed (I) for business objectives, risks, projects, tasks, and processes	(Morrison, 2015)
Enterprise Evolution Contextualization Model (EECM) components: partners, suppliers, government, internal enterprise structure, paradigm of creating value, mechanisms and practices, phenomena of interests, business processes, investment decisions, enterprise governance, IT governance, large data set, power, roles and responsibilities, customers	(De Vries et al., 2015)
Concepts: strategic component, customer & market, value creation	(Wirtz et al., 2016)
Resources, events, agents (REA) model, explaining exchange of value objects, i.e. services, products, money, or consumer experiences	(Hunka et al., 2016)
STOF (service–technology–organization–finance) model including activities for value creation and value capture	(Wass & Vimarlund, 2016)
Concepts: actions, agent, value flow, money flow, information flow, ports, relationship, and resources	(Romero et al., 2018)
Business Decentralization Canvas: proposed solution, validator incentive, value proposition, network governance, use/customer segments, reaching trust, interaction channels, cost structure, revenue streams	(Bujosevic, 2019)

Source: Authors' own study.

Business model concepts, which emerged in publications, revealed two main directions of development, i.e. value-orientation and relationship-orientation. The value-orientation is emphasised in contributions that include Osterwalder's publication citations. Authors of those publications accept the Business Model Canvas as fundamental for further model modifications. Relationship-oriented studies focus on identification of internal and external stakeholders, their activities and relations among them, i.e. relations of activities in processes and relations of actors in organisational structures. This paper provides the author business model concept, which is related to the more complex concept, i.e. enterprise architecture. Proposed in Figure 1 business model is expected to contribute to the management of the DAO business logic in several ways. This model includes four layers: Motivation–Business–Software–Hardware (MBSH). The MBSH model is to improve decision-making in these four layers, which are identified, described and related. Particularly, the model should improve making the decisions concerning concepts identified in this model.

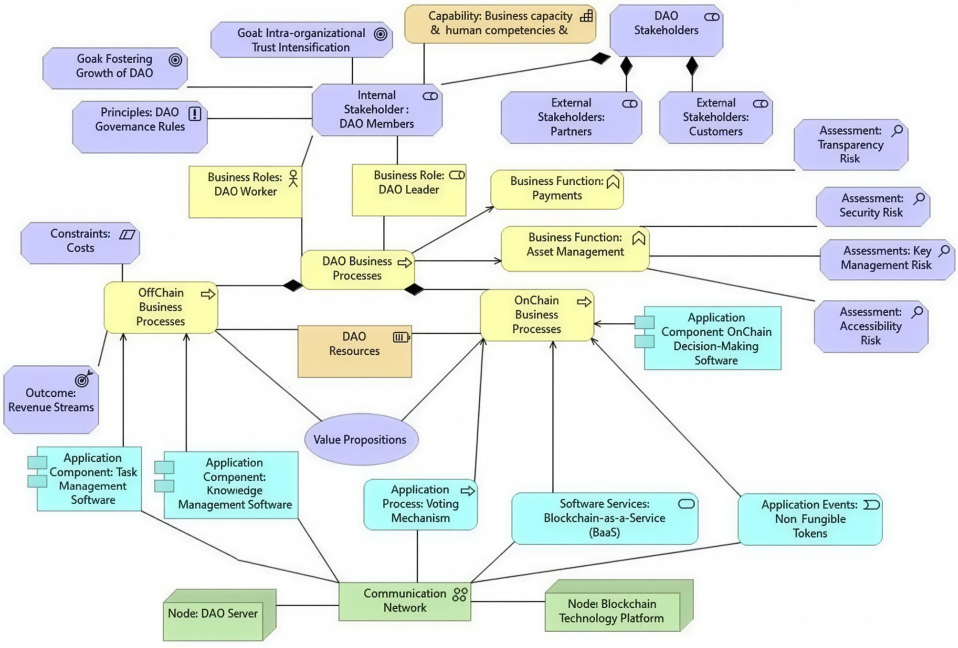

Figure 1. The MBSH-DAO Business Model

Source: Authors' own study.

The MBSH-DAO model includes Osterwalder Business Model Canvas (BMC) concepts, i.e. partners, customers, key activities hidden in processes, resources, communication network, cost, and revenue streams. In Figure 1, concepts are modelled in

Archimate language and interconnected according to Archi 5.2 (archimatetool.com) guides and Archimate language rules. However, beyond the BMC concepts, authors propose including some other additional components. Hence, in the Motivation layer, the authors consider the following concepts: stakeholders, principles for regulating the DAO activities, goal, capability, risks, trust, resources, values, cost, and revenue streams. Capability is ensured by people, organisational structure, culture, operating model, marketing and sales model, management model, and computer infrastructure. Values are related to the performance of the organisation. In the Business layer, the MBSH model covers business rules, functions, and processes. Processes, by definition, cover activities realised to achieve particular goals. In the Software layer, the MBSH model covers various software applications. Finally, the MBSH model Hardware layer includes computer platform, servers, and communication network, i.e. Internet.

TalentDAO case study research

Established in 2021, TalentDAO is a DAO that operates on blockchain technology. It was founded by a collective of scientists, researchers, organisational psychologists, and data experts. This international community, comprising approx. 1,000 individuals, is in the process of developing the world's first decentralised protocol for scientific publications subject to community review. The mission of TalentDAO is to unlock human potential, talents they all have within the decentralised digital economy. The operational structure of TalentDAO is organised into distinct units termed as "guilds". These guilds specialise in various domains including research, development, marketing, and writing. Additionally, there are individuals dedicated to managing operational activities and securing grants to further the organisation's objectives.

TalentDAO is engaged in scientific research aimed at fostering the growth of DAOs, while also educating the public on the enhanced autonomy and integrity that this decentralised work paradigm offers. The services provided by TalentDAO encompass a range of offerings, notably: the JDW, which serves as a global, decentralised protocol for scientific publications; the Newsletter of Decentralised Work, delivering insights on DAO science and related research; and consulting services tailored to DAOs (TalentDAO – Who We Are, n.d.).

Business model canvas of TalentDAO

The Business Model Canvas (BMC) encapsulates the operational framework and strategic essence of TalentDAO (Figure 2). It converges a diversified cohort of key partners including organisational scientists, strategists, and Web3 technology

providers, who drive key activities like scientific research to foster DAOs, protocol development for JDW, and educational courses through DAO Academy. TalentDAO aims to enhance human potential within the digital decentralised economy, offering insights for DAO efficacy, and promoting independent work and coordination. Its audience includes DAO communities, academics, and organisations interested in DAOs. Interaction is through community platforms, feedback on publications, and joint research. It relies on an expert team, blockchain technology, and educational resources from DAO Academy.

<table>
<tr><th>Key partners</th><th>Key activities</th><th>Value proposition</th><th>Customer relations</th><th>Customer segments</th></tr>
<tr><td rowspan="3">• organisational scientists
• strategists
• researchers
• DAO communities
• Web3 technology providers</td><td>• conducting scientific research to help DAOs thrive
• development of protocol for the Journal of Decentralised Work
• publishing research in the Journal of Decentralised Work
• offering courses on DAO through DAO Academy
• running the Newsletter of Decentralised Work</td><td rowspan="3">• unlocking human potential in the decentralised digital economy
• providing scientific insights to help DAOs succeed
• promoting the values of self-sovereign work, decentralised human coordination, and open-source knowledge</td><td>• community engagement through Discord and other web platforms
• open submission and feedback processes for the newsletter and journal
• collaborative research projects with DAOs</td><td rowspan="3">• DAO communities
• researchers in the social science
• individuals interested in decentralised work
• organisations looking to understand and integrate DAO principles</td></tr>
<tr><td>Key resources</td><td>Channels</td></tr>
<tr><td>• core team of experts in organisational science, strategy, and research
• blockchain protocol for the Journal of Decentralised Work platform
• DAO Academy educational materials
• Blockchain-as-a-Service (BaaS) Apps</td><td>• TalentDAO website
• Journal of Decentralised Work platform
• newsletter of Decentralised Work on Substack
• Discord community
• Twitter and other social media platforms</td></tr>
<tr><td colspan="3">Cost structure</td><td colspan="2">Revenue streams</td></tr>
<tr><td colspan="3">• predominantly variable costs (approx. 80–90% of total): research, publication, and community engagement, contributor rewards, blockchain transaction fees (gas fees)
• fixed costs (approx. 10–20% of total): ongoing platform maintenance and software subscriptions, development costs for the journal and newsletter platforms</td><td colspan="2">• grants and community funding (NFT minting)
• research-as-a-Service for DAOs
• possible future monetization of the Newsletter of Decentralised Work and the Journal of Decentralised Work</td></tr>
</table>

Figure 2. TalentDAO Business Model Canvas

Source: Authors' own study.

Engagement channels include its website, JDW platform, newsletter, and social media. Financially, it covers research and operational costs through grants, NFT sales, and research services, with plans to monetize its publications.

PEST analysis of the external environment

A PEST (political, economic, social, technological) analysis reveals that TalentDAO operates within a highly dynamic and challenging external environment.

– Political: The political and legal sphere is the most demanding for the organization. TalentDAO faces significant regulatory uncertainty and lacks a clear legal status in most jurisdictions, forcing it to rely on novel legal frameworks like those in the Marshall Islands. These unresolved legal questions pose a critical threat to its long-term sustainability.

– Economic: The DAO is exposed to high financial volatility due to its reliance on grant funding and the fluctuating value of the crypto assets held in its treasury. This makes long-term financial planning a considerable challenge.

– Social: Key social challenges include overcoming a high barrier to entry for non-experts and addressing the low community engagement common in decentralized communities. The organisation's success depends on its ability to educate the public and foster a genuinely active and inclusive community.

– Technological: The organization is fundamentally dependent on the underlying blockchain infrastructure (Ethereum), making it vulnerable to issues such as network scalability, security risks, and high transaction costs, which can hinder participation and operational efficiency.

Blockchain architecture

TalentDAO is an entity established on the decentralised open-source Ethereum platform, with its domain, talentdao.eth, registered via the Ethereum Name Service protocol. As of now, it lacks legal personality, though registration proceedings are underway in the Marshall Islands. This jurisdiction is selected due to its provision for recognizing DAOs as non-profit LLCs, thereby offering a legal domicile for such decentralised organisations. The structural design of TalentDAO ensures decentralisation, precluding the imposition of liability on any single individual for the collective actions of the DAO. The principal token associated with TalentDAO is denoted as talentBot (TLN), which is a Non-Fungible Token (NFT) anchored on the ERC-721 standard. The maximum total supply of TLN is capped at 223, with 206 holders presently in possession of these tokens (talentBOT (TLN) Token Tracker, n.d.). However, the initial distribution of TalentDAO's tokens was exclusively among eight stakeholders, primarily the co-founders of the DAO, each holding a single token (TalentDAO, n.d./a).

In its operations, TalentDAO leverages several software services named Blockchain-as-a-Service (BaaS) or various Web3 platforms, which authorise users through blockchain keys. For instance, Gnosis Safe software is utilised for budget management (Safe Wallet, n.d.), the Wonderverse website – for task management (Wonder – TalentDAO, n.d.), and Charmverse software – for knowledge management (Our DAO Tools, n.d.). TalentDAO explores various voting mechanisms to enhance its decision-making processes. Notably, it employs the Zodiac plugin for its Discord server to automate on-chain decision-making via a linked Gnosis Safe software (DeepDAO, n.d.). The Sobol App software is utilized to present information about the organisation, drawing from blockchain records and Discord server data (TalentDAO, n.d./b). Additionally, the Lens Protocol facilitates the aggregation of followers based on blockchain data (TalentDAO.lens, n.d.).

Tokens serve various purposes within TalentDAO. The initial token was minted during the DAO's establishment and is presently held by eight co-founders or highly engaged members (OpenSea, n.d.). In January 2023, TalentDAO unveiled a series of governance experiments in association with partners RaidGuild and Collabland. Utilising the Zodiac plugin on their Discord server, they are exploring different voting strategies including 1-person 1-vote, reputation-weighted voting, quadratic voting, and ranked choice voting. The Zodiac plugin facilitates the automatic execution of decisions made on Discord on-chain via a linked Gnosis Safe. These ongoing experiments consider various partners as eligible voters, enabling the integration and testing of NFT badges along with web3 socials to introduce network reputation facets. The price of talentBOT is 0.042 ETH (approx. EUR 60), and it is owned by 206 Ethereum users (talentBOT (TLN) Token Tracker, n.d.). Additionally, NFTs are utilised to support the organisation by minting tokens associated with specific articles, such as the TalentDAO Manifesto. Each minted NFT is priced at 0.01 ETH (around EUR 15) (Saulthorin, 2022a).

Actors, leaders, and organisational structure

The primary communication channel for individuals engaged in TalentDAO is its Discord server has registered 1,735 participants, with approximately 10% being active. Low user activity on the TalentDAO Discord is a common phenomenon in decentralized communities. It can be attributed to a high barrier to entry due to the specialized topic (Hassan & De Filippi, 2021) and unclear contribution pathways for new members, a known challenge in decentralized organizing (Puranam et al., 2014). Furthermore, the project-based nature of the work means most substantive discussions occur within smaller "guilds", making general channels appear less active.

Upon registration, users can select from one of the 10 roles, aligning themselves with various teams called "guilds" such as marketing, research or developer. The inaugural core team comprises 10 individuals, embodying a diverse spectrum of

educational backgrounds and professional experiences, which place them at the vanguard of their respective domains. Notable members like Nemo, k3nn.eth, Sherifoz, and Lisa Wocken, PhD, have an academic foundation in Industrial/Organisational Psychology, underpinning a deeper comprehension and enhancement of workplace dynamics. This nuanced understanding of organisational frameworks is augmented by the proficiencies of individuals such as ItamarGo, who curates a Newsletter on Decentralised Work, and Saulthorin, who is engaged in business development. Liagodoyf infuses a creative essence as a Design Lead, while Jaxcoder epitomises technological acumen as the Engineering Lead for JDW. The team's diversified expertise is further amplified by Prof. Burns, with his academic affiliations, and IsraelRex, a UI/UX and Product Designer (TalentDAO – Who We Are, n.d.).

The organisational structure of TalentDAO comprises several guilds or work teams, encompassing areas such as research, writing, operations, among others (TalentDAO, n.d./a). Team members autonomously decide which guild to join. The main organisational circle is The Membership Perks Circle, which encompasses all supporters and followers, including TalentBot owners, Gitcoin Donors, and TalentDAO followers on Lens Protocol.

Identifying decentralised leadership poses a challenge. The co-founding team of TalentDAO remains active, endeavoring to foster inspiration and provide a directional blueprint for organisational development by disseminating various articles across multiple web platforms such as mirror.xyz and smartcontractresearch.org. These articles are attributed either to individuals or to TalentDAO, making it challenging to discern the "official" policy of the DAO. "The TalentDAO Manifesto" was unveiled on 31 January 2022 by Saulthorin, in collaboration with several co-authors: theNemo#3075, Itamarg.eth, @k3nnethfrancis, @LisaWocken, Mr.Nobody#0187, sherifoz#7023, and Blockpusher_J#3137. Saulthorin, an industrial-organisational psychologist and former Deloitte Consulting employee, alongside his co-authors, delineates key principles underpinning TalentDAO (Saulthorin, 2022b). These include: 1) Mission: Unlocking human potential in the decentralised, digital economy; 2) Conducting scientific research to bolster DAOs; 3) Educating the public on the decentralised future of work; 4) Introducing a novel scientific protocol, JDW, predicated on blockchain technology to facilitate open, decentralised access to scholarly literature; 5) Aiming to decentralise knowledge and unlock talent (Saulthorin, 2022a).

The primary medium for coordinating and managing activities within TalentDAO is the Discord server. Additionally, a task board (kanban board) has been established on the Notion website (TalentDAO – Task Board, n.d.) and the Wonderverse app (Wonder – TalentDAO, n.d.). Furthermore, action proposals can be submitted through the Notion website (TalentDAO – Proposals, n.d.). The operational model is decentralised, allowing each participant to propose and engage in projects or tasks independently. Coordination is facilitated through regular virtual meetings hosted on Discord, which are conducted either for the entire community (termed as "city hall meetings") or within individual guilds or on designated thematic channels.

Onboarding within TalentDAO is facilitated through two primary channels: 1) via Discord, which hosts several "Welcome to TalentDAO" channels. Here, newcomers can authenticate themselves, acquaint themselves with the rules, and select a role. Additionally, periodic "Onboarding Meetings" are conducted by existing members to introduce and integrate newcomers (TalentDAO – Get Roles, n.d.); 2) through the Catapult website, which is interconnected with Discord. This platform provides an avenue for individuals to learn about TalentDAO's objectives and the various avenues for engagement (TalentDAO – Let's Get Started, n.d.).

There are no universally accepted guidelines concerning remuneration within TalentDAO. Given that the work predominantly adheres to a project-based model and is supported through grants, remuneration rules are formulated when team members submit grant applications. Additionally, various tokens (distributed via airdrops) are issued to those engaged in the DAO, serving as a measure of individuals' level of involvement in TalentDAO activities. For instance, tokens might be distributed for participation in a survey on DAO Health.

The theoretical ease of controlling a DAO as a blockchain-based entity arises from the transparency inherent in having all data recorded on a public ledger. However, practical control proves to be challenging. The anonymity of most blockchain accounts complicates the identification of individuals or entities involved. For instance, while it is straightforward to ascertain that TalentDAO received a grant of around EUR 50,000, additional research through external sources is required to determine the donor or how the funds were allocated. Within TalentDAO, there is no designated unit or individual responsible for audit and oversight. Moreover, financial data, apart from blockchain transactions, is not readily available on the web.

TalentDAO engages in active collaboration with other DAOs. Besides the previously mentioned Gitcoin and Zodiac, the organisation also cooperates with entities such as Orange Protocol and BanklessDAO. On the Discord server, several channels have been established to facilitate direct communication between members and these partner entities (TalentDAO – Friends, n.d.).

Discussion and conclusions

Presented case study of TalentDAO revealed many problems and challenges of this organisational form development. Literature study concluded that researchers are strongly interested in blockchain technology development. However, the DAO management and governance remain challenges in the science of management. Some authors have identified organisational theories, which are fundamental for DAO modelling. In this study, the DAO is considered as a specific form of virtual organisation. The specificity results from application of blockchain technology and tokenomics. DAOs are functioning as supply chains, finance and insurance institutions, tourism agencies, e-government and public services institutions, as well as

in healthcare sector, sharing economy, and for intellectual property management. The DAO can be treated as an additional organisational form put on the traditional network organisation for monitoring a particular domain transactions. Literature survey led to conclusion that the most suitable way of the DAO studying is just the case study method, because each DAO is unique. This organisational idiosyncrasy results from application domain, applied software services, as well as from the business model. Literature survey allowed to reveal various business model elements, which are mainly presented in a descriptive way. In this study, authors proposed the TalentDAO business model canvas, including identification of items, i.e. partners, activities, value proposition, customer relations, customer segments, cost structure, and revenue streams. The authors would like to add that the business model canvas can be expanded and new items can be included, e.g. principles and regulatory compliance, sustainability and environment issues, scalability and expansion directions, or geographical markets.

The presented case study allows for very idiosyncratic conclusions. TalentDAO embodies a progressive approach to organisational structure and governance through its DAO framework. By leveraging decentralised and blockchain-based platforms, TalentDAO promotes a distribution of authority, enabling a community-driven approach to decision-making and organisational development. This decentralised model fosters transparency as all transactions and decisions are recorded on the blockchain, providing a clear view of financial and operational activities. Moreover, the framework facilitates innovation and experimentation, as seen in TalentDAO's exploration of new governance models and voting mechanisms. The organisation's guild structure and active community engagement on its Discord server further demonstrate how DAOs can potentially lower operational costs and intermediary expenses, leading to a more cost-efficient operational model. This innovative approach to management showcases an organisational model that significantly diverges from traditional centralised structures, thereby contributing to the growing discourse on decentralised organisational models in the digital economy.

The TalentDAO, like other DAOs, operates in a legal grey area, and the ongoing registration process in the Marshall Islands underlines the legal and regulatory uncertainties surrounding DAOs. As DAOs scale, the decentralised nature could potentially lead to coordination and scalability issues, which are exacerbated by the dependency on technological platforms and blockchain infrastructure. The onboarding process may present a steep learning curve for individuals unfamiliar with blockchain technology, possibly impeding participation. The lack of a dedicated audit and control unit in TalentDAO highlights the audit and control challenges inherent in such decentralised setups, where the anonymous or pseudonymous nature of blockchain transactions could hinder oversight. Furthermore, financial sustainability remains a concern, especially as DAOs often rely on grants, community funding, or token sales for revenue generation. TalentDAO's financial structure, primarily supported by grants and community funding, accentuates these financial sustainability

challenges. Through the lens of TalentDAO, this examination sheds light on the potential and challenges of decentralised organisational models, offering a nuanced understanding of how such frameworks could reshape management paradigms in the evolving landscape of the digital economy.

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