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The Potential Contribution of DAOs to the Digital Transformation of Society: Ethical and Socioeconomic Perspectives on DAO-AI Synergy

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Abstract: This article explores the potential of Decentralized Autonomous Organizations (DAOs) to contribute to the digital transformation of society through the lens of ethics, social structure, and emerging economic paradigms. The focus is on the synergy between DAO structures and artificial intelligence (AI), and the ways in which such convergence may support new redistributive mechanisms such as Universal Basic Income (UBI) and Inclusive Capitalism. By combining conceptual analysis, relevant case studies, and data derived from existing research, the article evaluates whether DAO-AI systems can provide scalable, ethical, and decentralized alternatives to traditional organizational and economic models.

Keywords: DAO, artificial intelligence, inclusive capitalism, digital transformation, UBI, ethics, governance.

Introduction

In the context of rapid technological advancement and growing distrust in centralized institutions, new socio-technical paradigms are emerging that challenge traditional models of governance, economics, and social organization. Among the most promising innovations are Decentralized Autonomous Organizations (DAO) designed to enable distributed decision-making, transparent operations, and community-driven governance. A DAO is a blockchain-based system that enables people to coordinate and govern themselves mediated by a set of self-executing rules deployed on a public blockchain, and whose governance is decentralized (i.e., independent from central control) (Hassan and De Filippi, 2021).

Originally conceptualized as trustless coordination mechanisms for digital economies, DAOs have evolved into complex, programmable systems capable of managing resources, executing rules, and organizing labor with minimal human intervention.

Parallel to this development is the rise of Artificial Intelligence (AI), whose capacity to automate decision-making, optimize processes, and generate adaptive insights offers unprecedented leverage in both public and private sectors. However, AI systems are frequently deployed within centralized frameworks, raising concerns about accountability, equity, and ethical misuse.

This article proposes to explore the synergy between DAO and AI as a potentially transformative force in the digital evolution of society. By combining DAO's decentralized governance architecture with AI's adaptive capabilities, it may be possible to create scalable, transparent, and ethically informed systems that offer alternatives to traditional economic and institutional models. Such systems could support novel redistributive frameworks, such as Universal Basic Income (UBI), and foster a transition toward inclusive capitalism (World Economic Forum, 2020). Rather than proposing a one-size-fits-all model, the aim is to outline the conditions under which DAO-AI integration can meaningfully contribute to human-centered digital transformation.

Technological Foundation: Blockchain, Smart Contracts and The Logic of Automation

The foundation of any DAO lies in blockchain technology, a distributed ledger system that enables secure, transparent, and immutable recording of transactions across a network of nodes. Unlike traditional databases managed by central authorities, Blockchain technology is based on the ability of the algorithm to reach consensus in a decentralized network without resorting to external authority to testify and conduct the transaction. As such, blockchain technology not only solves some technical aspects of the system but also touches on very important societal issues of "trust", "authority" and "consensus" (Bjelajac and Bajac 2022).

At the heart of this infrastructure are smart contracts—self-executing code stored on the blockchain that enforces rules and conditions predefined by the community. Smart contracts serve as the "legal-operational core" of DAOs, automating governance, treasury management, and incentive distribution. For instance, DAO governance proposals and voting procedures are often encoded into smart contracts that trigger actions once quorum and approval thresholds are met. The "consensus" reached by the consensus algorithm embedded in smart contract should not be misunderstood as a kind of agreement on the truth of the event, but rather as an incentive-driven settlement, the truth of which is decided by random attempts to consume CPU power. The "fairness" of the consensus algorithm, or rather its legitimacy, does not lie in negotiations, the consensus of opinion or some notion of justice or objective truth, but in coincidence and large numbers that create an operational consensus of computers online (Brekke, 2019).

DAOs can be understood as programmable organizations whose behavior is guided by code, not human discretion. This introduces a new form of algorithmic coordination—an emergent logic of automation where rules are enforced not by institutional authority but by decentralized code. These organizations challenge the very notion of centralized control by distributing decision-making across a network of token holders or verified participants.

Another crucial concept is scalability, which refers to the system's ability to handle increased demand without compromising performance or security. Early blockchain implementations such as Bitcoin faced limitations in transaction throughput, but newer protocols like Ethereum 2.0, Arbitrum, and Polkadot aim to enhance scalability through techniques such as sharding and layer-2 solutions.

In parallel, Artificial Intelligence (AI) has made significant advances in automating cognitive tasks, from natural language processing to predictive analytics. While blockchain provides transparency and tamper-resistance, AI brings adaptivity, learning, and dynamic optimization. AI-driven DAOs introduce a new organizational paradigm, in which autonomous agents operate independently, making decisions without continuous human oversight. These entities represent not only a technological revolution, but also the potential to produce and commercialize their own goods and services through AI coordination, while directing profits to real human beneficiaries. In this configuration, AI DAOs could function as semi-autonomous economic actors whose surplus is redistributed to human stakeholders. Looking ahead, such systems may play a pivotal role in advancing Universal Basic Income (UBI) frameworks, which are increasingly discussed as viable responses to the socioeconomic disruptions induced by digital transformation (Bajac & al, 2022). UBI is a system in which a government (or private entity) gives all citizens a fixed, regular payment regardless of the citizen's income level, age or employment status (Matthew, 2018).

The convergence of DAO and AI rests on the compatibility of two technological logics:

- Blockchain ensures governance integrity through decentralized, transparent enforcement.
- AI ensures governance efficiency through intelligent automation, insight extraction, and adaptive learning.

Traditional organizations	AI DAOs
• Governance Top down management, many information & decision bottlenecks • Trust Based on experience and past relationships • Decision-making Based on expertise and seniority • Operational costs High	• Governance Embedded in the code (smart contracts) • Trust Crptography (Blockchain) • Decision-making Automated thanks to AI (independent agents or AGI) and smart contracts • Operational costs Low

Table 1. Comparison: Traditional vs. AI DAO organization

This dual infrastructure sets the stage for next-generation socio-technical systems that combine the legitimacy of collective decision-making with the operational power of intelligent machines. Such systems can, in theory, automate not only resource distribution but also ethical reasoning, conflict resolution, and social coordination at scale.

DAO Structure and Economics: Governance, Tokens and Incentives

Decentralized Autonomous Organizations (DAOs) operate through a structural logic fundamentally distinct from that of traditional hierarchical institutions. While corporations rely on centralized boards and managerial hierarchies to make and enforce decisions, DAOs distribute authority horizontally, often through on-chain governance mechanisms that empower stakeholders to propose, deliberate, and vote on initiatives (Reijers & al 2018).

At the core of DAO governance lies the governance token - a cryptographic asset that typically grants its holder voting rights within the organization. These tokens are often issued during an initial distribution phase, (e.g., Initial Coin Offering[1], airdrops, or liquidity mining) and can also represent ownership, access rights, or reputational weight, depending on the DAO's design.

There are several governance models commonly used in DAOs:

- Token-weighted voting, where voting power is proportional to token ownership.
- Quadratic voting, which aims to equalize influence by making vote cost increase quadratically with the number of votes cast.
- Reputation-Based Governance where voting power is earned through meaningful contributions (not just token ownership). Reputation points are tied to activity and value delivered.
- Hybrid Governance combine elements of multiple governance types, customizing them based on DAO needs [2].

Economic coordination in DAOs is guided by incentive alignment mechanisms coded into smart

[1] An Initial Coin Offering (ICO) is a fundraising mechanism in the cryptocurrency industry, akin to an Initial Public Offering (IPO) in the traditional financial sector. Companies aiming to gather resources for the creation of a new coin, application, or service can launch an ICO. Participants interested in the project can acquire tokens during the ICO and receive a new cryptocurrency token issued by the company. This token may have utility related to the product or service the company provides or represent a stake in the company or project.

[2] **Example**: Decentraland DAO mixes token voting, reputation, and other models to balance flexibility with fairness.

contracts. These mechanisms include:

- Treasury management, where collective funds are used to support ecosystem development.
- Workstream funding, where contributors are compensated for tasks via token payments.

Invisible Hand vs. Code-as-Law

While the economics of DAOs remain experimental, their potential lies in the programmability of incentives - the ability to encode economic rules directly into infrastructure, allowing for the emergence of new forms of digital cooperativism and post-capitalist experimentation. In this sense, the DAO becomes not just a decision-making tool, but an evolving organism, continually reshaped by its community and codebase.

In classical economics, Adam Smith's 'invisible hand' symbolizes the idea that individual self-interest operating in a free market can unintentionally lead to outcomes that benefit society as a whole. This principle rests on assumptions of rational behavior, price signals, and minimal state intervention, allowing decentralized actors to engage in economic exchange without central planning (Smith, 2013).

In contrast, DAOs impose explicit coordination frameworks in which incentives, constraints, and outcomes are predefined by algorithmic rules. As Lawrence Lessig famously argued, in the digital age, "code is law" - and in DAO ecosystems, governance is law encoded **(**Lessig, 1999). All members agree that their participation in The DAO is entirely subject to the code as it is implemented on the Ethereum blockchain, a concept known as "Lex Cryptographia," or. the "code is law" (DuPont, 2017).

Dimension	"Invisible Hand" (Adam Smith)	DAO Codified Coordination
Nature of Coordination	Emergent, spontaneous	Designed, algorithmic
Medium of Trust	Social norms, market signals, legal institutions	Blockchain protocols, smart contracts
Decision-making	Implicit, decentralized via market behavior	Explicit, rule-based via governance mechanisms
Incentive Structure	Profit motive guided by price system	Tokenomics (programmable incentives)
Governance	Indirect via market forces and state policy	Direct via token-weighted or community voting
Transparency	Opaque (subject to information asymmetry)	Fully transparent (on-chain auditable logic)
Adaptability	Slow, dependent on policy and institutional change	Dynamic (via governance updates, parameter changes)
Ethical Assumptions	Maximizing self-interest yields collective good	Incentive design aligned with community-defined goals
Role of Participants	Consumers/producers in market ecosystems	Stakeholders, co-creators of protocol rules and outcomes
Failure Modes	Externalities, monopolies, inequality	Code exploits, plutocracy, low engagement, design rigidity
Philosophical Status	Naturalistic – the market as an organic system	Constructivist – the market as a programmable, intentional artifact

Table 2. Comparison: Adam Smith's Invisible Hand vs. DAO Codified Coordination

DAO+AI Synergy: Functional, Ethical and Social Implications

The convergence of Decentralized Autonomous Organizations (DAOs) and Artificial Intelligence (AI) represents one of the most compelling frontiers in socio-technical innovation. AI DAO can transform the concept of DAO in order to achieve its mission, to enable everyone to contribute to the development of artificial intelligence by close human supervision (Bajac & al. 2022). While DAOs provide transparent, community-governed infrastructures for decentralized coordination, AI brings the power of adaptive

learning, real-time optimization, and autonomous decision-making. Their synergy could profoundly reshape how decisions are made, how value is distributed, and how institutions - both digital and physical - are governed.

Functional Integration: AI as an Operational Agent within DAOs can enhance DAO operations by functioning as a cognitive agent capable of supporting or even executing tasks such as proposal evaluation based on historical data, sentiment analysis, or predictive modeling, automated moderation of community discussions and dispute resolution processes, resource allocation through machine learning–based prioritization of treasury spending, behavioral analytics to identify low-engagement zones or participation anomalies, dynamic incentives, adjusting rewards in real time according to contribution quality. This kind of AI-augmented governance does not necessarily replace human decision-making, but extends it, enabling DAOs to function at scale and in high-complexity environments without centralized bureaucracy.

Ethical Implications: the integration of AI into governance processes raises crucial ethical questions. Who writes the algorithms? Who audits the models? And how do we ensure that AI agents operate within the moral framework defined by the DAO community? The process of classifying data is a core practice in artificial intelligence, but "what is often missing is a more fundamental set of questions: How does classification work in machine learning? In what ways do classifications interact with the classified? What unspoken social and political theories underlie and support these classifications of the world" (Crawford, 2021).

Key concerns include:

- Algorithmic bias: AI models trained on historical or market data may reproduce existing inequalities.
- Opaque decision-making: Black-box AI systems may violate the DAO's norm of transparency.
- Consent and autonomy: Members may be governed by systems they do not fully understand or control.
- Delegated ethics: If AI can vote or prioritize, what ethical logic is embedded in its actions?

Social Implications: the synergy of DAO and AI also prompts reevaluation of the future of work, labor value, and participation. As AI automates cognitive and managerial tasks, human roles in DAOs may shift toward curation, ethical oversight, and creative problem-solving, greater participation by marginalized groups, more efficient and fair disbursement of shared resources.

DAO+AI systems can be envisioned as symbiotic governance frameworks-networks in which collective intelligence (community values, social trust, deliberation) and artificial intelligence (data modeling, automation, optimization) are integrated into a co-evolving architecture. Rather than framing AI and DAO as opposites-one mechanistic, the other democratic—this article posits that their combination, if ethically stewarded, could result in novel institutional forms capable of addressing challenges that neither could solve alone. The rise of AI DAOs and blockchain-based governance introduces the possibility of non-state, decentralized Universal Basic Income systems-funded, managed, and distributed by smart contracts and governed by communities rather than governments.

Ethical Horizons and Inclusive Capitalism: The Social Role of DAO-AI Systems

The integration of DAOs and AI is not merely a technological evolution - it represents a potential inflection point in how societies conceptualize governance, value, equity, and participation. This convergence challenges the dominant institutions of the industrial age and opens the door to new forms of collective agency, distributed ownership, and ethical design.

From Capitalism to Inclusive Capitalism

While DAOs often function within market frameworks and utilize crypto assets, their architecture enables the redistribution of value, cooperative ownership, and programmable incentives that go beyond extractive capitalism. When combined with AI, these systems can help operationalize the core tenets of

inclusive capitalism. In de Jong's view, inclusive capitalism involves creating institutions that balance economic prosperity with fairness and sustainability, redefining success beyond mere wealth accumulation to include shared value and long-term collective benefit. (de Jong, M. 2021).

Key principles include:

- Democratization of value creation – enabling broader participation in productive and financial systems.
- Transparency and accountability – embedding fairness into protocol logic.
- Stakeholder-centric design – prioritizing long-term community outcomes over short-term profit maximization.
- Resilience through decentralization – reducing dependency on monopolistic actors and fragile institutions.

In this context, DAO-AI ecosystems function as a post-institutional platforms technological commons governed by code but directed by community.

Ethics by Design: Encoding Justice and Inclusion

The possibility to encode governance rules and decision-making criteria into smart contracts and AI agents introduces a new ethical frontier: one where morality becomes a programmable function. However, this capacity also entails responsibility: who defines fairness in algorithmic redistribution? Can bias be eliminated, or merely shifted to technical parameters? How are minority voices protected in systems that favor consensus or token-weighted voting? What counts as contribution, and who gets to decide?

DAO-AI systems must grapple with algorithmic ethics, ensuring that decisions about inclusion, rights, and access reflect collective values rather than encoded prejudice or plutocratic tendencies. This invites the development of participatory ethics: systems where norms evolve dynamically and reflect a diversity of perspectives.

Univerzal Basic Income as a Moral Imperative

Universal Basic Income, in this context, becomes more than a policy experiment-it is a moral proposition grounded in the principles of human dignity, autonomy, and solidarity. A DAO-based UBI system - governed openly, executed fairly, and funded collectively-can reflect a new digital social contract, especially in a world marked by job displacement through automation, deepening economic inequalities, institutional erosion and loss of trust.

AI-supported redistribution mechanisms offer not just efficiency, but the possibility of moral scalability, where collective values are implemented at planetary scale, with minimal bias and maximum transparency.

Risks of Digital Exclusion and Algorithmic Elitism

However, utopian narratives must be tempered by realism. DAO-AI systems, if poorly designed, may reinforce the very dynamics they seek to escape: digital exclusion of those without infrastructure or skills; algorithmic elitism, where technical literacy becomes a gatekeeper; technocratic opacity, replacing institutional bureaucracy with black-box systems; governance capture, where token wealth substitutes political capital.

The Future of Governance as Collective Intelligence

DAO-AI systems present a third path between state-centric governance and corporate control-what some theorists call algorithmic commons (Thompson & al. 2020). In these systems:

- Governance is participatory and modular.
- Rules are transparent and alterable.
- Ethics are embedded and subject to communal revision.
- Value is not extracted but circulated.

This vision aligns with the idea of collective intelligence at scale: distributed communities enhanced by computational agents, coordinating not through coercion or competition, but through protocolized cooperation. DAO-AI synergy thus becomes not only a tool for redistribution, but a platform for

reimagining democracy, solidarity, and justice in the digital era.

Conclusion: From Infrastructue to Imagination

The convergence of DAOs and AI offers more than just technical innovation, it invites a profound rethinking of how human societies can coordinate, distribute, and govern in an increasingly digital, uncertain, and interdependent world. By embedding decision-making processes into transparent code and augmenting them with intelligent systems, DAO-AI synergy introduces a new institutional grammar-one that is decentralized, programmable, and potentially ethical by design.

This article has explored how DAOs and AI can jointly support new redistributive mechanisms such as Universal Basic Income (UBI), contribute to inclusive capitalism, and operationalize collective ethic at scale.

Yet, the promise of these technologies is not guaranteed. Risks of plutocracy, algorithmic bias, digital exclusion, and technocratic opacity persist. Without vigilant design, critical reflection, and participatory engagement, DAO-AI systems may replicate or even amplify the inequities they claim to solve.

Nonetheless, the DAO-AI model offers an experimental and modular arena for prototyping alternative futures-one where value is distributed, governance is shared, and ethics are not just debated but implemented through open, modifiable systems. In this light, DAOs and AI do not merely automate governance; they expand the imaginative space of the political - where code becomes a site of justice, and infrastructure becomes a site of care.

The task ahead is to ensure that these new tools are governed not only by logic and efficiency but by the principles of inclusion, transparency, solidarity, and dignity. The DAO-AI horizon may not yet be fully formed, but it is already shaping the questions we ask, the systems we build, and the futures we dare to imagine.

The future is as uncertain as ever, but the world of the future must be decentralized. Decentralization must become the guiding idea of the millennial transition of the post-democratic world towards the distribution of power to a much larger number of social actors than has been the case so far. Decentralized Internet and new technologies will provide countless organizational forms and opportunities for each person to choose the way to participate in the global collaborative economy (Bajac & al. 2022).

Conflict of interests

The authors declare no conflict of interest

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