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EDITED BY

Guangsheng Yu,
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REVIEWED BY

Gianluigi Viscusi,
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Claudio Schifanella,
University of Turin, Italy
Mayssam Daaboul,
American University of Science and
Technology, Lebanon

*CORRESPONDENCE

Kate Bennett,
✉ kate.bennett@student.uts.edu.au

RECEIVED 17 May 2025

ACCEPTED 08 August 2025

PUBLISHED 05 September 2025

CITATION

Bennett K (2025) Governance for regenerative
coordination: the evolution from DAO to
DAO 3.0.

Front. Blockchain 8:1630402.
doi: 10.3389/fbloc.2025.1630402

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Governance for regenerative coordination: the evolution from DAO to DAO 3.0

Kate Bennett*

Institute for Sustainable Futures, University of Technology Sydney, Sydney, NSW, Australia

Introduction: Decentralized Autonomous Organizations (DAOs), digital organizations governed by code and community, offer new paradigms for collective governance; yet many early examples have reproduced the power asymmetries, exclusionary participation models, and inefficiencies found in traditional systems. This study examines how DAO governance can evolve to support fair, inclusive, and regenerative capital flows across distributed ecosystems, particularly in contexts where traditional coordination infrastructure is limited.

Methods: A qualitative case study was conducted on Hypha, an organisation that evolved from a classic DAO to a Decentralized Human Organization (DHO) and subsequently to an Adaptable Organization, or DAO 3.0. Data was collected through semi-structured interviews and document analysis, then interpreted using a People–Process–Technology framework to identify governance design principles. This was supported by a comparative taxonomy mapping the evolution from DAO 1.0 to DAO 3.0.

Results: Findings show a progression from early token-weighted DAO 1.0 models, through protocol-optimized DAO 2.0 structures, to DAO 3.0's modular, relational, and context-adaptive designs. Hypha's governance innovations include multi-layer modular voting, "leadership without control" protocols, real-time capital flow mechanisms, and trust-based safeguards that address fairness failures, enhance adaptability, and enable governance to respond dynamically to human complexity and local contexts.

Discussion: The Hypha case study positions DAO 3.0 as a prototype for regenerative coordination infrastructure where governance operates as a living system, balancing technological automation with human-centered design. This research expands DAO governance theory by clarifying conceptual boundaries, integrating recent literature, and providing practical guidance for policymakers, developers, and capital providers seeking to design equitable, regenerative governance and coordination systems.

KEYWORDS

DAO governance, DAO 3.0, regenerative finance, decentralized coordination systems, participatory governance, modular governance architecture, Web3, development finance

1 Introduction

Decentralized Autonomous Organizations (DAOs) have emerged as a radical reimagining of organizational structure, promising to replace centralized control with transparent, token-based coordination and distributed decision-making. The launch of The DAO on Ethereum in 2016 marked the first large-scale implementation of this concept: an

ambitious experiment that both coined the term and catalyzed the broader DAO movement. Despite its early pitfalls and the hard lessons it left in its wake (Jentzsch, 2016), the project ignited a wave of innovation in decentralized governance infrastructure. Yet as the ecosystem has expanded, many projects have struggled to deliver on their democratic ideals. Rather than achieving broad-based participation, most DAOs have replicated familiar patterns of exclusion: technocratic interfaces, plutocratic voting mechanisms, and rigid governance protocols that often concentrate rather than distribute power.

These limitations are particularly acute in global development contexts, especially in low-income and emerging markets, where financial exclusion, institutional distrust, and infrastructure gaps already challenge traditional models. Poorly designed DAOs risk reinforcing digital colonialism rather than enabling inclusive governance (Birhane, 2020; Hassan and De Filippi, 2021). At the same time, as the field of regenerative finance – that is, finance grounded in living systems principles and designed to support the evolutionary health of people and planet (Bennett 2025a, Bennett 2025b; Fullerton 2015, Fullerton 2017; Mang and Haggard, 2016) – continues to evolve, new questions are emerging around how decentralized systems, when thoughtfully designed, might support more participatory, place-based approaches to coordination, particularly in under-resourced environments.

This study is motivated by the need to understand how DAOs can overcome well-documented governance challenges and support participatory, regenerative development, particularly in resource-constrained environments. Hypha (<https://hypha.earth>) – the focus case for this study – is a decentralized coordination and governance platform designed to enable purpose-driven communities to manage shared resources, mobilize capital, and coordinate collective action. While many DAO platforms (e.g., Aragon, Colony, DAOstack) are experimenting with governance innovations, Hypha was selected for this case study due to its explicit design for regenerative coordination and the author's direct access to, and experience with, its core team and their multi-year governance evolution. Unlike other platforms, Hypha is intentionally built around regenerative principles, providing unique relevance to the research aims.

This study addresses two key research questions: Firstly, how can DAO governance structures evolve to support adaptive, inclusive, and context-specific coordination? Secondly, how might these structures enable participatory capital mobilization in support of regenerative development, especially in emerging markets?

In Hypha's case, the first observed shift away from standard DAO structures was in their transition to a "Decentralised Human Organisation" (DHO) model, acknowledging that truly regenerative practice requires human experience–sensemaking, participation, and development–to be placed at the heart of the DAO. Building on this, Hypha transitioned to an Adaptable Organization (AO) model recognising that living systems, including human organizations, are by nature responsive, adaptive, and flexible. Governance structures must therefore accommodate phases of centralization and decentralization, collaboration and autonomy, automation and human judgment, meeting organizations where they are and supporting vitality at every stage of development. In this paper, that final AO stage is situated conceptually as DAO 3.0: a third-generation governance architecture that balances technical

automation with human and ecological flourishing, maximizing regenerative potential by designing for modularity, relational trust, and systems thinking inspired by the logic of life itself.

Hypha's contributors are globally distributed, and earlier iterations of the technology have been applied in various community-led, impact-focused initiatives. However, the platform's development remains primarily grounded in the team's own organizational experience, serving as a live test-bed for regenerative governance in practice. Drawing on qualitative interviews with Hypha core contributors, this paper explores how its governance system evolved in response to practical, philosophical, and technical constraints, and what this evolution reveals about the future of decentralized coordination. The analysis applies a regenerative theoretical lens with empirical data analyzed based on the People–Process–Technology (PPT) framework: a well-established approach for structuring organizational change analysis that distinguishes between human factors, institutional processes, and enabling technologies. (Leavitt, 1965; Barki et al., 2008).

In doing so, the paper contributes both conceptually and practically to the fields of DAO governance, regenerative finance, and development strategy. It reframes DAO governance as a dynamic, relational process: one that must move beyond tokenomics and automation-centric design to embrace human complexity, contextual adaptability, and the interdependence of capital, governance, and community. It positions Hypha's DAO 3.0 model as an early prototype for regenerative coordination infrastructure, offering insight not only to blockchain developers and DAO theorists, but also to policymakers, capital providers, and local actors seeking to design more just and inclusive systems.

2 Background and conceptual framing

Governance, broadly, refers to the frameworks and mechanisms through which collective decision-making and resource allocation are coordinated within organizations (Puranam et al., 2014). With the rise of blockchain technology, new models of decentralized governance have emerged that reimagine authority, control, and trust (Febrero and Pereira, 2022; Lumineau et al., 2021). Blockchain-based platforms provide programmable, transparent infrastructures for collaborative organization, but also introduce new boundary conditions and design trade-offs (Pereira et al., 2019). DAOs represent the most fully realized expression of this paradigm, enacting organizational forms governed by both code and community, but their real-world impact depends on overcoming well-known governance challenges.

The literature on DAOs is expanding rapidly, reflecting a field in flux as both technical architectures and governance logics evolve. To date, most research has focused on technical platform features (Baninemeh et al., 2023), protocol design, or early taxonomies of DAO forms and operations (Bonnet and Teuteberg, 2024; Qin et al., 2023; Valiente et al., 2022). These studies have advanced the state of knowledge by mapping the technical, social, and architectural dimensions of DAOs and providing decision frameworks for platform selection and deployment. However, a common limitation is their tendency to treat DAO governance as static, primarily technological, or abstracted from the lived realities of participants and communities (Tan et al., 2023). Few studies address

how DAOs actually evolve in practice—that is, how governance structures adapt over time in response to human, social, and ecological complexity, or how coordination can be operationalized beyond technical code.

Despite rapid technical progress, most DAO research and practice to date remains heavily focused on protocol design, voting mechanisms, and economic incentives, with relatively limited attention paid to the lived, human experience of organizational participation, adaptive governance, and the social complexity that emerges at scale (Tan et al., 2023).

This paper addresses this gap by foregrounding the organizational, relational, and adaptive aspects of DAO evolution, with particular focus on human-centered and regenerative coordination in real-world contexts. The following subsections first review the trajectory of DAO governance and its limitations, then present Hypha as a practical case study of lived governance and technology evolution, before contextually grounding this enquiry into DAO governance for regenerative coordination.

2.1 From DAO ideals to governance realities

DAOs are widely touted for their potential to democratize governance and automate coordination, promising to replace centralized intermediaries with code-based rules and community consensus. In practice, however, most DAOs remain dominated by token-weighted voting, rigid structures, and interfaces that exclude those with limited digital literacy or capital. Definitional ambiguity persists (Hassan and De Filippi, 2021) including whether autonomy implies the absence of human agency, or whether governance must also be decentralized beyond infrastructure alone. As Rikken et al. (2019) point out, governance in DAOs remains highly entangled with both application and infrastructure layers, particularly in permissionless environments, challenging assumptions about separable, “pure” decentralization. As Borgogno and Martino (2024) argue, early DAO implementations often replicated firm-like hierarchies and unresolved power asymmetries under the guise of decentralization, challenging the assumption that smart contracts alone can guarantee democratic participation or accountability.

These limitations are especially problematic when DAO infrastructure is deployed in development contexts. In many low-income and emerging markets, governance and finance challenges are deeply intertwined with systemic inequities in digital access, financial inclusion, and institutional trust. DAOs, if poorly designed, risk becoming a new form of digital colonialism, embedding technocratic decision-making into systems that already marginalize those at the edge. As Gloerich and others have argued, blockchain systems can reproduce the same extractive, universalizing logic that has historically underpinned colonial and capitalist expansion, drawing on the constructs of data colonialism and digital frontierism (Couldry and Mejias, 2023; Gloerich, 2023; Thatcher, O’Sullivan and Mahmoudi, 2016). Conversely, with thoughtful design, DAOs could evolve to serve as adaptive governance frameworks: tools for enabling local agency, transparent value flows, and regenerative collaboration at the edges of the financial system.

While the technological possibilities are vast, the potential for DAOs to reinforce or subvert existing inequities depends critically

on their ability to adapt to the lived realities and relational dynamics of their participants, as argued by Chaffer et al. (2024) in the context of human-agent coevolution. This seems to be at odds with the persistent focus of DAO literature on technical and static aspects of DAO governance. Recent surveys (Bonnet and Teuteberg, 2024; Qin et al., 2023; Tan et al., 2023; Valiente et al., 2022) and platform studies (Baninemeh et al., 2023) have mapped DAO architectures, selection criteria, and key technical-social dilemmas. Yet, they overwhelmingly analyze DAOs as static systems, with little attention to how governance structures adapt over time to human, social, and ecological complexity. Usability, onboarding, meaningful participation, and the interplay of technical and social dynamics remain persistent problems, as human-computer interaction (HCI) and organizational science approaches are rarely applied rigorously to DAO systems (Tan et al., 2023).

2.2 Reframing DAO governance: toward adaptable organizations

Hypha’s journey provides a unique practice-based lens for exploring these adaptive challenges. Initially structured as a classic DAO, Hypha’s early iterations struggled with the same limitations as the broader Web3 ecosystem: friction in decision-making, unclear roles, and token-centric rigidity. In response, Hypha’s team undertook a multi-year governance redesign, shifting from code-centricity to human systems, relational coherence, and ecosystemic coordination.

This led initially to the development of the Decentralized Human Organization (DHO) – a model that foregrounds sense-making, community care, and inner development as core governance principles. Unlike DAO 2.0 models that focus primarily on technical upgrades, the DHO approach embeds relational and developmental practices directly into governance architecture. As a transitional step, it bridged automation with adaptive, ecosystemic logic, culminating in Hypha’s current governance: DAO 3.0 – an adaptable organization with modular, composable layers, nested decision-making, real-time capital flows, and trust scaffolding for both institutions and coalitions. Contextual adaptability in Hypha is operationalized through its membranaric governance spaces¹, role-based participation, customizable voting logic, and sense-making scaffolds, enabling different subgroups to select, adapt, and iterate governance processes to local needs and evolving contexts.

Hypha’s DAO 3.0 model thus responds not just by reengineering protocols, but by centering trust, contextual adaptation, and the real-world coordination of people and systems. Drawing on systems

1 Membranaric governance spaces refer to semi-permeable, nested organizational units (akin to biological membranes) that both protect local context and identity and enable selective flows of information, resources, and participation across the DAO. This is distinct from the “node” concept used in much of the DAO literature (e.g., Qin et al., 2023), as membranaric spaces emphasize the importance of boundaries, adaptability, and context-sensitive collaboration at multiple layers of governance.

thinking, regenerative development, and living systems design, Hypha's architecture treats governance as an emergent property, one that must dynamically evolve as context shifts. In this way, Hypha moves from "governing the machine" to "cultivating the organism" (Hutchins 2019), operationalizing a governance logic grounded in living systems, not just code.

This approach contrasts sharply with most DAO research, which (even when attentive to modularity and stakeholder diversity) rarely engages the full complexity of human, ecological, and systemic evolution. Human-centered, adaptive governance structures, such as those pioneered by the DHO and DAO 3.0 models, remain rare but increasingly necessary (Tan et al., 2023). As conceptual work in human-agent collaboration (Chaffer and Goldston, 2024) and living systems design (Laloux, 2014; nRhythm, 2025) makes clear, effective decentralized systems must adapt continuously, not only at the technical, but also at the social, ethical, and organizational level.

2.3 Grounding the enquiry: governance for regenerative coordination and capital flows

Tan et al. (2023) argue that the next frontier in DAO research lies in bringing organizational science, ethnography, and systems thinking into the design and evaluation of DAOs. They emphasize that DAOs should be seen as evolving, complex adaptive systems whose legitimacy, resilience, and regenerative potential depend not only on code, but on emergent social structures, communication norms, and the continuous interplay of people, process, and technology.

Hence the focus of this research on DAO governance for regenerative coordination: a mode of organizing and governing collective action that places living systems—human, ecological, and social—at the centre of design and decision-making. Distinct from automation-centric models, regenerative coordination prioritizes conscious participation, sensemaking, and the development of human actors, recognizing that adaptive and equitable outcomes arise from the ongoing interaction of people, technology, and context. The purpose of coordination is not merely the efficient execution of pre-programmed rules, but the continuous emergence of value, agency, and resilience within and across communities and ecosystems.

This framing draws on the work of Fullerton (2015), Mang and Haggard, 2016, and organizational theorists such as Laloux (2014), who argue that living systems thrive when organizational forms are designed to nurture the potential of both individuals and the wider system. In the context of DAOs, regenerative coordination thus entails governance architectures that honour human sovereignty, embed purpose at every level, and ensure that those affected by decisions retain meaningful agency within the process.

The analysis that follows examines Hypha's evolution from DAO to DHO to DAO 3.0 – alongside its latest V3 DAO technology—to investigate how adaptive governance structures can support fair, inclusive, and regenerative flows of capital, particularly in contexts where institutional infrastructure is weak, financial ecosystems are fragmented, and real-world impact is often under-resourced.

In doing so, the paper contributes to two parallel academic and applied debates: how DAO governance structures can evolve to support adaptive, inclusive, and context-specific coordination; and how these structures might enable more participatory capital mobilization in support of regenerative development, particularly in emerging markets.

Hypha's experience does not offer a perfect model, but rather a living system in motion: an evolving experiment illuminating the design tensions and practical constraints involved in building governance systems truly capable of supporting people and planet in the long term.

3 Methodology

This paper adopts a qualitative case study methodology to explore how decentralized governance systems can evolve to support fair, inclusive, and regenerative capital flows. Hypha was selected as a critical case due to the transparently documented nature of its governance evolution, traceable through publicly accessible coordination tools, including archived discussions on Discord, comprehensive meeting recordings, and on-chain proposal and voting records that log every formal decision made within the organization. These open records document Hypha's progression through three distinct stages of DAO governance architecture: an initial DAO model, the transition to a Decentralized Human Organization (DHO), and the implementation of a DAO 3.0 framework *via* the launch of Hypha V3. This case offers a unique opportunity to examine governance innovation across technical, human, and philosophical dimensions, grounded in lived practice and real-time experimentation.

To structure the analysis, this study employs the People–Process–Technology (PPT) framework: a multidimensional analytic lens first introduced by Harold Leavitt (1965) and widely adopted in digital transformation and organizational change scholarship (Chang and Chen, 2025; Lockett, 2023; Soja and Soja, 2017; Taher, 2023). PPT captures the dynamic interplay between human factors, process innovation, and technological infrastructure, and is a well-established framework for digital transformation across diverse fields—including manufacturing, education, healthcare, and tourism (Mugdh and Pilla, 2012; Sunmola et al., 2021; Taher, 2023; Wu et al., 2024). It is also frequently used to structure organizational readiness, innovation, and change management (Wu et al., 2024; Lockett, 2023).

While PPT is widely recognized in digital transformation research, most studies apply it to traditional or IT-centric contexts, with few addressing the dynamic, adaptive interactions among people, process, and technology in decentralized digital ecosystems or regenerative finance. This study extends prior PPT applications by operationalizing the framework within the context of DAO governance and regenerative organizational design. In doing so, it provides an empirical foundation for analyzing how human, processual, and technological factors co-evolve in the design and evolution of decentralized governance, addressing a noted gap in both DAO and PPT literatures.

In this case, the PPT framework is used to explore how human readiness (people), institutional logic and coordination (process), and infrastructure design (technology) converge within Hypha's evolving governance system. This approach aligns with the broader methodological design of the author's doctoral research, which draws on Participatory Action Design Research (PADR) principles to examine the co-development and deployment of regenerative finance infrastructure in collaboration with both local and global actors.

Primary data was collected through semi-structured interviews with three core contributors to the design, deployment, and ongoing evolution of Hypha's platform. Participants were selected for their sustained, hands-on involvement across governance design, technical architecture, tokenomics, and organizational development. In keeping with Hypha's highly collaborative, multi-hatted team model, each interviewee contributed insights across multiple domains, reflecting both specialized expertise and the integrated, participatory approach that characterized the V3 development process. While the small sample reflects the bounded and deeply collaborative nature of the core development team, it enabled an in-depth exploration of the platform's internal evolution and decision-making. Interviews focused on participants' reflections on earlier DAO iterations, the transition to DHO and DAO 3.0 models, and their assessment of Hypha's approach to inclusion, fairness, and systemic adaptability.

At the time of data collection, Hypha V3 had not yet launched publicly; therefore, the research centers on the perspectives of those actively involved in the platform's internal design and testing. These participants were uniquely positioned to reflect on the motivations, constraints, and philosophical evolution informing V3. As the goal was not to achieve saturation across a population but to trace the governance evolution of a single platform, the study prioritizes depth over breadth. Future research could expand this inquiry through user-focused interviews post-deployment.

Interview transcripts were analyzed using a combination of inductive thematic analysis and pattern coding, aligned to the PPT framework. A preliminary round of open coding in NVivo generated 43 unique codes. These were then reviewed for thematic coherence and grouped into three primary clusters aligned to the PPT model. An additional parent code—Contextual Barriers—was added to capture environmental and infrastructural conditions that, while external to Hypha's governance design, significantly influence its viability and real-world impact. Coding memos were maintained to support analytic reflexivity and mitigate researcher bias. Subcodes were developed inductively through recurring participant language and reflect themes such as relational trust, dissent scaffolding, modular interoperability, and infrastructure constraints. A full coding structure is provided in [Supplementary Appendix A](#).

Secondary data sources included Hypha's whitepapers, tokenomics documentation, platform demos, and ecosystem communication materials, which were triangulated with the interview findings. The analysis was further contextualized with reference to DAO governance literature, regenerative design theory, and decentralized finance scholarship.

This approach aligns with established principles for rigorous case study research in information systems and software engineering (Runeson et al., 2012), emphasizing contextual depth, transparency in data collection, and analytical triangulation. This case study does

not seek to generalize across DAO ecosystems but instead offers a depth-oriented analysis of one platform's governance architecture. Its purpose is to surface the design tensions, cultural shifts, and technical adaptations involved in prototyping regenerative coordination infrastructure, and to inform broader conversations about the future of decentralized governance.

4 Findings

The findings are structured using a People–Process–Technology framework, enabling a layered analysis of how Hypha's governance model has evolved across human behaviour, operational mechanisms, and technological design in response to challenges commonly observed in DAO ecosystems. Drawing on primary interviews with three core contributors—triangulated with whitepapers, platform documentation, and deployment notes—this section explores how these three dimensions intersect to produce a governance system designed to support regenerative capital flows, fairness, and adaptability in distributed ecosystems.

4.1 People: consciousness, inclusion, and co-creation

This section examines the human dimension of governance: focusing on the cultural readiness, inner development, and social inclusion required for decentralized systems to function regeneratively. It explores how Hypha's governance architecture scaffolds participant growth, supports diverse engagement styles, and fosters a shift from transactional to relational participation.

Hypha contributors emphasized that tooling alone is insufficient to deliver fair or inclusive outcomes. What's required first is a cultural and cognitive shift from transactional, hierarchical thinking toward relational, co-creative, and regenerative modes of engagement. As one contributor explained: *"You need to change yourself first. If you expect the tech to make the system regenerative without that inner shift, it's not going to work."*

This shift is particularly pronounced across generational lines, where younger participants are often more naturally attuned to decentralized systems, while older users may carry embedded assumptions that need unlearning. The governance infrastructure thus plays a pedagogical role, supporting evolving levels of contributor readiness.

To reduce burnout and confusion, Hypha V3 introduced modular governance "spaces" that let participants contribute in ways aligned with their level of expertise, commitment, and interest. Rather than forcing everyone into the same decision-making structure, these spaces enable tiered participation with clear roles and soft boundaries. One participant noted: *"It's about putting people in the right circle so they can commit in the right way. The idea of a core team is not about exclusivity—it's about stewardship."*

In Hypha V3, a "governance space" is a modular, semi-autonomous unit—functioning like a subDAO or working group—with its own membership, decision logic, and treasury. Spaces can be created for specific projects, teams, or initiatives, allowing participants to tailor governance protocols to their unique

context. For example, a project team can form a new space, onboard relevant members, set custom voting thresholds, manage local funds, and enter into agreements with other spaces or the parent DAO. This nested structure, referred to as “membranic” because it operates like semi-permeable boundaries in biological systems. Enables both independent action and interconnected collaboration.

This structural shift allowed Hypha to replace the “hyper-involved or disengaged” dynamic of earlier versions with a model that invites participation without demanding uniformity.

4.2 Process: governance as emergent, layered, and adaptive

This section analyzes the operational logic of Hypha’s governance system: how decisions are proposed, shaped, and enacted. It highlights the shift from flat, uniform structures to layered, membranic architectures that prioritize sense-making, support alignment over consensus, and allow governance to adapt organically across contexts.

At the process level, Hypha’s governance evolution reflects a move away from static DAO templates toward emergent, layered, and dialogic decision-making. Key among these was the institutionalization of sense-making—the space for dialogue and deliberation before formal decision-making. *“Posting a proposal without having done the sense-making beforehand? Ninety percent of the time, it fails.”*

This learning drove the integration of a dedicated discussion feature, designed to support structured co-creation and incorporate diverse viewpoints before proposals advance. Unlike consensus or majority voting, this approach enables alignment even without agreement: *“I may not agree, but I understand and support the direction.”*

Hypha also embraced a fractal and membranic architecture, allowing decision-making processes to emerge organically across nested layers, whether global, local, or thematic. This layered coordination framework replaced the one-size-fits-all approach of early DAOs, where all members were expected to engage equally in all decisions, often resulting in chaos or stagnation.

Choice emerged as a consistent design principle in Hypha’s process layer. Users can select their own governance configurations, customize entry/exit rules, and define decision-making thresholds. As one contributor put it: *“The guiding principle was not to tell people what they cannot do—it was to give them the freedom to do what works in their context.”*

4.3 Technology: modularity, accessibility, and real-time capital flow

This section explores the infrastructure layer underpinning Hypha’s governance system. It traces the redesign of Hypha’s technical architecture to enable modularity, seamless onboarding, and real-time capital flows, while abstracting away the complexity of Web3 to ensure accessibility across diverse user groups and environments.

The technological layer of Hypha’s governance system was redesigned from the ground up around a principle of elegant

simplicity: *“We chose to rewrite the whole thing rather than keep piling complexity. Our goal became to achieve complexity through simplicity.”*

This shift culminated in a fractal technical architecture, in which every governance space has three core elements: membership, agreements, and treasury. This standardized yet flexible schema allows for rapid setup, intuitive use, and interoperability across nested or standalone DAOs. Importantly, Hypha concealed the technical complexity of blockchain systems, making Web3 invisible to the end-user: *“We’ve put blockchain where it belongs—in the background. No one needs to know it’s there. They just log in with their email and start contributing.”*

The platform also supports real-time, cross-currency capital flows, automated fund deployment through proposals, and space-to-space agreements. These features make it possible to mobilize capital into hyperlocal contexts—i.e., the smallest, community-specific scale—without friction, while ensuring traceability and transparency in how funds and impact circulate. Mobile accessibility and chatbot-style modular interfaces are part of the roadmap, although the MVP version focused first on a web interface for speed and completeness. Nonetheless, the architecture was intentionally designed for future adaptation in low-bandwidth or last-mile environments, a critical condition for equitable participation in development contexts.

4.4 Comparative framing: addressing common DAO governance challenges

To contextualize the design evolution of Hypha within broader DAO governance challenges, [Table 1](#) compares common limitations in DAO tooling with corresponding design responses in the Hypha ecosystem. This comparative framing underscores how Hypha’s governance architecture both responds to and reimagines core challenges found in early DAO tooling. It also lays the foundation for broader reflection on what these innovations imply for the future of DAO governance, which is the focus of the following discussion.

5 Discussion: reimagining governance for regenerative coordination

The findings presented in the previous section illustrate that Hypha’s governance architecture represents more than just a technical evolution—it reflects a deeper reorientation of what decentralized governance can be. In contrast to many DAOs that replicate financialized or technocratic governance structures, Hypha’s trajectory signals a transition toward regenerative governance: a model that centres human consciousness, relational trust, and system adaptability as core design principles.

This positions Hypha within a distinct category of what might be termed DAO 3.0: a new generation of decentralized governance systems that respond to the limitations of early DAO tooling by embracing complexity, diversity, and evolution. Where DAO 1.0 emphasized hard-coded rules and token-weighted decisions, and DAO 2.0 focused on protocol optimization and security, DAO 3.0 reflects a philosophical and technical shift toward

TABLE 1 How Hypha addresses typical DAO limitations.

Governance challenge*		Hypha response
Participation	Token-based plutocracy Technocratic exclusion	• Role-based governance: decouples voting power from capital ownership • Multi-voting plugins: enables diverse voting methods tailored to community context • Web2-style onboarding: simplifies user interfaces, reducing technical barriers to entry • Wallet-free participation: allows engagement without requiring crypto expertise
Coordination	Governance fatigue/low turnout	• Sense-making mechanisms: structured spaces for dialogue and alignment before formal voting • Layered governance: distributes decision-making responsibilities to prevent fatigue • Cultural ceremonies: fosters collective purpose, enhancing sustained engagement
Adaptability	Rigid or one-size governance logic	• Modular templates: enables customizable governance protocols to meet specific organizational needs • Composable governance spaces: supports flexible and adaptive decision-making at multiple scales
Applicability	Lack of real-world applicability	• Field-tested use cases: implemented across diverse real-world contexts including energy, climate, and economic regeneration initiatives • Community validation: actively shaped by practical input and iterative feedback from actual users
Accountability	Top-down token control	• Leadership without control principle: shifts emphasis from centralized token-holding to distributed agency and collective stewardship • Safety rails: embedded protocols ensure accountability and mitigate power concentration risks
Legitimacy	Opaque processes/misalignment between authority and trust	• Role-based agency structures: clarify who holds responsibility, reducing ambiguity in decision rights • Visible trust metrics and reputational layers: reinforce alignment between authority and social capital • Deliberative process scaffolding: ensures legitimacy is built through inclusion, not just execution (e.g., proposals only pass after sense-making and dissent windows)
Security	Vulnerabilities in governance-layer integrity	• Embedded trust scaffolding: real-time sense-making and dissent mechanisms reduce the likelihood of hostile or unfit proposals passing without scrutiny • Nested governance layers: limits the blast radius of bad decisions by distributing authority and isolating risk within specific subspaces • Human-in-the-loop architecture: reintroduces judgment and contextual awareness, mitigating risks from code-only execution

*Governance challenges in this table are synthesized from common themes in DAO, literature (see (Borgogno and Martino, 2024; Buterin, 2021; de Filippi, 2019; DuPont and Campbell-Verduyn, 2017; Han, Lee & Li, 2025; Hassan and De Filippi, 2021; Rikken, Janssen & Kwee, 2019) and grouped into seven higher-order categories: participation, coordination, adaptability, applicability, accountability, legitimacy, and security. A complete mapping of the DAO, governance challenges synthesized from the literature, along with their source references, is provided in [Supplementary Appendix Table B1](#).

governance as a living system: emergent, contextual, and co-evolving with the communities it serves.

These research findings contribute to ongoing academic and practitioner debates in three interrelated ways, which are outlined below. While this paper does not engage in a formal theoretical exposition of the terms “ecosystem” or “infrastructure,” both concepts feature prominently in the empirical findings and warrant clarification. Here, “ecosystem” refers to the relational and organizational networks in which Hypha operates, including community contributors, technology users, partner organizations, and aligned impact initiatives. “Infrastructure” refers to the integrated technological and governance tools that enable coordination and value exchange within and across those networks.

5.1 Governance as a living system: from control to conscious coordination

Much of the DAO literature critiques the tendency toward hard-coded, inflexible governance systems that assume participants are rational actors operating in static environments (Baninemeh et al., 2023; de Filippi, 2019; Qin et al., 2023; Tan et al., 2023; Valiente et al., 2022). For example, Baninemeh et al. (2023) and Qin et al. (2023) highlight that early DAOs (1.0) relied on deterministic, rule-bound logic and token-weighted voting, leading to brittle structures with little capacity for context or dissent. While Tan et al. (2023) and Valiente et al. (2022) emphasize that a central challenge for DAO

governance is the need to move from static code toward adaptive, relationship-driven models that support learning and resilience.

By contrast, Hypha treats governance not as a fixed structure but as a living process, one that evolves with the needs, capacities, and contexts of its participants. This mirrors calls in recent literature for “complex adaptive” and “living systems” DAOs (Qin et al., 2023; Tan et al., 2023) and is a view aligned with regenerative systems theory, which sees governance as an emergent property of relationship, not simply a function of structure or code (Fullerton, 2015; Mang and Haggard, 2016).

In this model, sense-making precedes sense-doing. Deliberation and dissent are not inefficiencies to be minimized, but critical stages of collective alignment. “*I may not agree, but I understand and support the direction*” was a phrase used by multiple contributors, capturing a form of coherence that transcends consensus. Importantly, this does not suggest unanimity or harmony, but rather functional alignment: the capacity to move forward while holding difference.

The evolution of Hypha’s governance architecture reflects this philosophy. Features such as discussion stages, optional scaffolds for dissent, and layered participation enable the system to breathe, adapting not only to new users and contexts but also to evolving internal values and capacities. The emphasis on nested, membranic spaces allows subgroups to move at their own pace while staying aligned to the broader whole, a key feature of resilient, regenerative systems and an evolution beyond the limitations mapped in recent platform reviews.

Dimension	DAO 1.0: Code as Governance	DAO 2.0: Protocol Optimization	DAO 3.0: Regenerative Coordination
Participation	Token-weighted voting, low engagement; participation linked to capital	Modular governance protocols; delegation, quadratic voting, increased (but uneven) participation	Role-based, context-aware participation, human-centered engagement and “delegated reputation”
Tooling	Hard-coded rules, inflexible smart contracts, limited user interfaces	Modular governance tools (Snapshot, Aragon, Gnosis, etc); incremental customization	Nested, membranic governance structures; adaptive modules; interoperable APIs
Decision Logic	Rigid, automated logic, all-or-nothing voting	Delegation and staking, committee-based or delegated voting, incremental adaptation	Sense-making, dissent scaffolding, context-sensitive decision processes
Inclusion Bias	High capital bias, technical barriers; exclusion of less wealthy and less technical users	Tech-enabled stakeholder tooling (quadratic voting, reputation, role differentiation); partial reduction of bias	Human-led trust, learning, and identity-based inclusion; emphasis on real-world context and diversity
Governance Role	Execution layer only; focus on rule enforcement, minimal adaptability	Optimization layer; governance modules improve process efficiency, but remain protocol-centric	Living system: governance as adaptive, evolving, and relational infrastructure
Examples:	<i>The DAO (2016)</i>	<i>Colony, Aragon, DAOstack, Moloch</i>	<i>Hypha v3</i>

FIGURE 1
Evolution of DAO governance models: From code-based coordination to regenerative design. Comparative evolution of DAO, governance models; DAO, 3.0 builds on prior iterations by integrating social, technical, and philosophical shifts toward relational, adaptive, and regenerative governance systems. (See [Supplementary Appendix B](#) for a literature synthesis underpinning this DAO, governance evolution framework).

5.2 Tools that teach: infrastructure as a pedagogical medium

Where traditional platforms assume users will adapt to the system, Hypha assumes the system must teach users how to participate meaningfully, a direction anticipated but rarely realized in the DAO 2.0 platforms (Aragon, DAOstack) discussed by [Baninemeh et al. \(2023\)](#) and critiqued by [Tan et al. \(2023\)](#).

Hypha’s interfaces and design flows are intentionally structured to help participants “learn decentralization by doing.” This includes intuitive onboarding, modular templates for governance and budgeting, and clear affordances for role-based participation. The design logic reflects a recognition that governance is a developmental journey, and that infrastructure should scaffold capability-building rather than assume it. This is aligned with the recent call by [Tan et al. \(2023\)](#) for greater usability and participatory learning in the space: “DAOs continue to struggle with onboarding, inclusive participation, and decision-making processes that are

accessible and meaningful to a diverse range of contributors.” [Valiente et al. \(2022\)](#) and [Qin et al. \(2023\)](#) similarly note the importance of moving beyond technical onboarding to scaffolded, context-sensitive engagement, but highlight that most current architectures remain “automation-first.”

Hypha’s approach mirrors the concept of tools as teachers, drawing on regenerative design principles where form and function co-evolve. By making participation easier to navigate and more accessible (e.g., login with email, clear invitations to contribute at varying levels), the platform reduces friction while preserving the complexity needed for meaningful coordination. This “infrastructure as pedagogy” reflects a broader shift toward living, developmental governance systems ([Chaffer and Goldston, 2024](#); [Tan et al., 2023](#)), and supports the co-evolution of user capability and system adaptability ([Qin et al., 2023](#)). Rather than abstracting governance into arcane rituals or burying it in technocratic assumptions, Hypha renders it visible, learnable, and adaptable, providing an interface not just to a platform, but to a culture.

5.3 Beyond function: DAO 3.0 as ecosystem infrastructure

The multi-layered, modular design of Hypha V3 enables governance to flex across scales, supporting both nested DAOs and cross-DAO value exchange, capabilities now being theorized as crucial for ecosystemic finance—where communities, projects, and capital providers co-create governance structures that reflect their shared purpose and operational needs—and adaptive, coalition-based governance (Qin et al., 2023; Valiente et al., 2022; Baninemeh et al., 2023).

Baninemeh et al. (2023) identify the emergence of “nested DAOs, customizable decision logic, and interoperability” as defining features of the most advanced platforms. Qin et al. (2023) further suggest that DAOs are evolving toward systems that “serve specific organizations with multiple goals and complex functions, with robots and digital humans assisting humans”, a vision realized in Hypha’s modular, context-aware design. Valiente et al. (2022) propose ontology-based frameworks to enable interoperability, cross-organizational governance, and knowledge formalization—needs directly addressed in Hypha’s membranous governance architecture and modular APIs.

Hypha’s support for real-time, cross-currency transactions, combined with reputation-based mutual credit and customizable voting logic, shows that governance and capital infrastructure can be integrated, offering a foundation for coalition-based financing and regenerative economic design. This responds directly to critiques of DAO governance as form without function (Tan et al., 2023) and offers an applied model for coordinating funding and governance in regenerative development (Fullerton, 2015; Mang and Haggard, 2016). As Tan et al. (2023) conclude, the next frontier for DAOs is the realization of human-centric, adaptive, ecosystemic governance, and this is exactly what Hypha’s V3 architecture seeks to achieve.

These findings both confirm and extend the taxonomy and future directions outlined in recent DAO governance literature (Baninemeh et al., 2023; Qin et al., 2023; Valiente et al., 2022). Together, these insights suggest that DAO governance must evolve not just in structure, but in paradigm: toward a living, adaptive, and relational form of coordination that reflects the complexity of the ecosystems it aims to serve. The following section introduces a conceptual framework for this evolution, positioning DAO 3.0 as a distinct governance model emerging from, and moving beyond, the limitations of its predecessors.

6 DAO governance evolution: from code to coordination

DAO governance has undergone a marked transformation since its origins in 2016. While early implementations (DAO 1.0) emphasized automation, code-based execution, and token voting, second-generation models (DAO 2.0) introduced modularity, off-chain coordination mechanisms, and optimization through stakeholder tooling. DAO 3.0 models—including Hypha’s V3 – extend this trajectory by embedding human-centered

design, adaptive logic, and relational coordination into the governance stack.

Figure 1 contrasts these three generations of DAO architecture across five key governance dimensions: participation, tooling, decision logic, inclusion bias, and governance role. The framework is derived from a synthesis of DAO governance literature and extended through field-based insights from the Hypha case. While simplified for conceptual clarity, the distinctions reflect widely documented patterns across DAO ecosystems. For a literature-informed breakdown and full citation of sources supporting these distinctions, see [Supplementary Appendix Table B2](#) in Appendix B.

This comparison highlights how DAO 3.0 reframes governance as a dynamic, living system capable of supporting regenerative capital flows across complex ecosystems. The DAO 3.0 models, as described here, integrate modular infrastructure, participatory scaffolds, and real-time capital flows to support governance as an adaptive, relational system rather than a static protocol.

7 Limitations

This study is limited in several important respects. First, while it provides in-depth insights into the design, philosophy, and architecture of Hypha’s DAO 3.0 model, it does so prior to the platform’s full public release. As a result, the findings reflect primarily the intentions and reasoning of system designers rather than direct user experiences or adoption outcomes. Future research will be needed to assess how Hypha’s governance innovations perform in practice across diverse ecosystems and stakeholder groups.

Second, the study focuses on a single case, which naturally limits generalizability. While Hypha’s evolution offers a compelling prototype for regenerative governance, it is grounded in a specific community, context, and development trajectory. Nonetheless, the insights presented here contribute to broader conversations in DAO governance theory, regenerative finance, and decentralized coordination, and may serve as a foundation for comparative or longitudinal analyses across diverse DAO ecosystems.

Third, while Hypha’s governance infrastructure is already aligned with many of the principles necessary for deployment in low-income and emerging market contexts—such as wallet-free participation, role-based voting, and real-time capital flow—its full accessibility in these environments will depend on ongoing interface development. At the time of writing, the platform operates primarily through a web-based interface, which may pose usability barriers in mobile-first, low-bandwidth settings. However, the Hypha team has signalled a roadmap toward more inclusive access models, including mobile-responsive design, chatbot interfaces, and embedded governance modules that reduce cognitive and technical load. These developments will be critical for unlocking the platform’s full potential in under-resourced environments. Future research should explore how these interface adaptations impact participation, trust, and coalition-building in real-world development finance contexts. Without careful design and contextual grounding, even advanced DAO models risk reinscribing what Gloerich (2023) describes as

“blockchain colonialism”: a system where datafication and tokenization overwrite cultural, ecological, and relational complexity with tradable abstractions.

And lastly, although DAO 3.0 models address many internal governance limitations, issues around legal status and liability remain unresolved. The absence of formal legal personhood continues to create uncertainty around member liability, contractual enforceability, and external legitimacy (Borgogno and Martino, 2024). However, the emergence of DAO-recognized legal entities in jurisdictions such as the Marshall Islands, Wyoming, and Liechtenstein reflects a growing willingness to provide legal scaffolding for decentralized coordination. Concurrently, DAO 3.0 architecture (such as Hypha’s V3) is increasingly designed to operate as a digital twin of off-chain legal entities, enabling real-world accountability while preserving the flexibility and inclusivity of on-chain governance.

8 Conclusion

This study set out to examine how DAO governance systems can evolve to support fair, inclusive, and regenerative coordination, particularly in contexts where traditional infrastructure is limited. Through a qualitative case study of Hypha and its progression from DAO to DHO to DAO 3.0, this research has surfaced critical design shifts that challenge prevailing Web3 governance paradigms and offer new possibilities for adaptive, trust-based, and context-responsive organizational models.

Theoretically, this work advances DAO scholarship by articulating and empirically grounding a new taxonomy of governance evolution. The DAO 3.0 model expressed in this study moves decisively beyond automation-first, token-voting paradigms to envision governance as a living, relational system. It demonstrates how participatory scaffolding, nested modularity, and conscious sensemaking can be operationalized to support adaptive and regenerative coordination. In doing so, the research extends the scope of DAO theory from structural and technical questions to include cultural, ethical, and ecological dimensions, addressing recent calls for more human-centered, purpose-driven, and contextually adaptive forms of decentralized governance.

Practically, the findings provide actionable insights for designers, platform developers, policymakers, and practitioners across the Web3 and development finance landscapes. The integration of real-time capital flows, flexible governance layers, and embedded trust mechanisms in Hypha’s architecture demonstrates how DAOs can move from static protocols to dynamic systems capable of supporting ecosystemic finance and coalition-based development. This points to tangible pathways for building more inclusive, resilient, and impactful digital organizations.

Importantly, this research also highlights the critical role of culture, consciousness, and care in the evolution of decentralized systems. As Hypha’s case shows, the future of DAO governance lies not just in new tools, but in a shift of mindset: from code as structure to stewardship as practice, and from coordination as control to regeneration as ethos.

While the present study is bounded by its pre-launch focus on a single platform, it lays a foundation for future research. The next phase will examine user engagement, participation, and impact as Hypha V3 is deployed in real-world settings, including an ecosystemic finance pilot for regenerative development. As the technology evolves, there will also be opportunities to evaluate how interface innovation shapes participation and trust, especially in low-income or under-resourced contexts. Hypha’s rich archive of governance records presents unique opportunities for researchers to further investigate the lived dynamics of decentralized coordination, sensemaking, and power-sharing.

Beyond the Hypha-specific use case, further research should critically examine how power, inclusion, and ethical risks—including digital colonialism and governance capture—play out in post-deployment contexts and diverse communities, ensuring that DAO systems serve to redress rather than reinforce historical inequities.

In sum, this paper contributes to an emerging movement that seeks to evolve decentralized governance from code to consciousness, from rigid structure to relational stewardship, and from extraction to regeneration. The evolution mapped here demonstrates that DAOs, when intentionally designed and continually reimaged, have the potential to become infrastructures for more just, adaptive, and regenerative collaboration, serving both people and planet in a rapidly changing world.

Data availability statement

The original contributions presented in the study are included in the article/[Supplementary Material](#), further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by University of Technology Sydney Human Research Ethics Committee (HREC), approval number ETH24-9253. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

KB: Writing – review and editing, Writing – original draft.

Funding

The author(s) declare that financial support was received for the research and/or publication of this article. This research was conducted as part of the author’s doctoral studies, which are supported by the Australian Government through a Research Training Program (RTP) Scholarship and a Top-Up Scholarship from the Digital Finance Cooperative Research Centre (DFCRC).

Acknowledgments

The author wishes to thank the interview participants—Ronnie Potel, Alex Prate, and Arsenije Savic—for their generous contributions of time, insight, and lived experience in shaping this research. Appreciation is also extended to the broader Hypha ecosystem for its ongoing commitment to open collaboration and governance innovation.

Conflict of interest

The author declares no commercial or financial relationships that could be construed as a potential conflict of interest. The author previously collaborated with Hypha as an Impact Ecosystem Builder over two years ago and is currently engaged in a separate ecosystemic finance pilot with the organisation as part of doctoral research. These relationships did not influence the design, analysis, or reporting of this case study.

Generative AI statement

The author(s) declare that Generative AI was used in the creation of this manuscript. The author used ChatGPT by OpenAI to assist with language refinement, structural

suggestions, and synthesis of existing ideas. All intellectual content, analysis, and original contributions are the work of the author. The final manuscript was reviewed and approved solely by the author.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fbloc.2025.1630402/full#supplementary-material>

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