Qeios

Peer Review

Review of: "ICT, AI, and Web Coevolution are Explained and Predicted by Humanity's Increasingly Multidimensional Connectivity and Coordination"

Hiroaki Hamada[1]

1. Independent researcher

1. Summary

This is a conceptual paper that sets out to explain, and to predict, the coevolutionary history of ICT, AI, and the Web through four independent dimensions of human organization (R: resources / A: alternatives / D: directives / E: effort). Against the widely received progression from Web1 "read" to Web2 "read/write" to Web3 "read/write/own," the author supplies a fourth dimension and derives Web4 as "read/write/CONTROL/own."

The method is theoretical elaboration and microhistory in the sense of Hargadon and Wadhwani (2023), extending the author's own prior Evolutionary Intelligence framework (Siegfried 2026) to a macrotemporal and macrospatial scale. The argumentative core is a diagnosis of dysfunction in existing Web3 DAOs: ownership consensus already exists, but control consensus is absent, and DAOs therefore cannot function as organizations.

The paper's expectations for AI-based control governance rest on the empirical review of DAO governance failure in Section 4.2. This section draws on independent empirical research and merits reading as a contribution in its own right. It assembles Gini coefficients approaching 1.0, voter turnout figures (mean 1.77%, median 0.10%), the seven-year collapse of DAOstack, and the concentration of mining pools on commercial cloud infrastructure as a third layer of centralization.

doi.org/10.32388/O5YO5C

Two theoretical formulations also deserve credit. The first is the reciprocal dependence of ownership consensus and control consensus: neither has organizational effect without the other. The second is the structural analysis in the latter part of Section 3.3, in which alternatives (A) prioritized by the control process slide into the position of directives (D) in the subsequent ownership process. This is the most precise piece of reasoning in the manuscript.

The central claim, however — that AI assuming multidimensional control yields decentralized and legitimate collective control — remains largely unexplained.

I have three major concerns.

The content of "AI assumes control" is left blank; the explanans is itself unexplained

Both the explanatory and the predictive power of this paper depend on the proposition that multidimensional coordination scales only through AI. Yet on what AI actually does and how, the manuscript offers no objective function, no input format, no aggregation rule, and no convergence condition. What exists is a placement diagram — "multiagent DAOs," "evolving EI agents," "multidimensional cell-based database (MOLAP-type)" — and the author concedes the gap directly, stating that the software for 3D control consensus and 4D coordination are the pieces that are still missing.

Two omissions are particularly consequential.

(a) The generation of the alternatives (A) dimension is entirely absent. Alternatives must be generated before they can be evaluated, and agenda-setting power dominates voting power. Where AI generates the alternative set, the concentration of power criticized in the DAO analysis does not disappear; it migrates to the training data and generative distribution of the model.

(b) Imputation from sparse evaluation matrices is unavoidable but unaddressed. A multidimensional cell structure makes evaluation load grow with the product of participants, directives, and alternatives, so no human population can populate every cell. Dense preference matrices must therefore be estimated from sparse input, and this is where the genuine necessity for AI lies. But an imputed preference is a preference the individual has not expressed, and resource allocation grounded in it constitutes not a delegation of control but a substitution for it. The manuscript does not draw this distinction.

Because the explanans is unexplained, the predictions concerning the six unopened doors of Figure 2 remain a restatement of what follows deductively from positing four dimensions and stipulating that

each Web stage adds one.

Request: Specify the agent and process by which the A dimension is generated. Distinguish expressed from imputed preferences, and argue for the legitimacy of using the latter in resource allocation. In addition, separate those DAO pathologies enumerated in the manuscript that AI-based control would ameliorate from those it would aggravate — sybil resistance and agenda-setting concentration in particular.

2. Verifiability of control consensus is not formalized

The technical core of the paper is the claim that connecting 3D ownership consensus and 3D control consensus in series yields 4D coordination and permits reuse of existing blockchain node infrastructure (Section 3.3, final column of Figure 2). This symmetry does not hold.

Ownership consensus can dispense with trust because its output is a factual proposition that any node can verify independently by re-executing the computation. The output of control consensus is a normative decision; re-executing the computation on a given preference matrix cannot establish whether that matrix was honestly reported in the first place. The trust-generating mechanism of blockchain is therefore not portable to control consensus. What the two share is computational resources, nothing more.

The author criticizes the "marketing mirage" of decentralization in Web3 governance in forceful terms. The manuscript should explain why the same criticism does not rebound onto its own Web4 construction.

Request: Provide a definition of verifiability for the output of control consensus, or an explicit formalization of what secures its legitimacy. Justify subsuming both processes under a single concept of "consensus."

3. Absence of engagement with the literature on AI-mediated collective decision-making and social choice

The central claim of the paper is that multidimensional control consensus is achievable only through AI. Yet citation of research in which AI assumes coordination or governance functions is limited to a single item, Bernhart (2024), and that item appears in a concessive passage as an insufficient precedent; the difference between it and the author's own construction is never explained.

Several directly relevant literatures can be relevant.

- **AI-mediated deliberation.** The Habermas Machine (Tessler, Bakker et al., *Science*, 2024) tested LLM-based synthesis of divergent preferences with more than 5,700 UK participants. Its task is adjacent rather than identical to the author's — linguistic synthesis of common ground rather than cardinal allocation under budget constraint — but the manuscript's claim that no computational apparatus exists for multidimensional preference integration cannot be sustained without addressing it. The critical literature on that system, concerning whether consensus optimization is compatible with deliberation as communicative autonomy, bears directly on Major Concern 2.
- **Opinion aggregation platforms** such as Pol.is.
- **Proportional resource allocation rules.** The Method of Equal Shares accommodates cardinal ballots, carries proportionality guarantees, is computable in polynomial time, and has been deployed for participatory budgeting in cities in Poland and Switzerland. Human-in-the-Loop variants developed with vTaiwan and Kultur Komitee allow participants to control how much of the decision is delegated to the aggregation algorithm and how much is reserved for deliberation — precisely the design question the manuscript defers to future research.
- **Proxy voting under incomplete preferences,** a literature explicitly motivated by blockchain governance systems with weighted voters and large numbers of community-generated proposals. This is the author's own problem setting. That literature also establishes that partial preference elicitation is vulnerable to manipulative elicitation attacks, which bears on Major Concern 1(b).
- **Social choice theory.** The manuscript's prescription — replacing approval voting with cardinal prioritization — engages the central problems of this field, yet no work in it is cited. The move from ordinal to cardinal information does depart from the premises of Arrow's theorem and is worth defending explicitly. But it relocates rather than dissolves the difficulty, leaving open (i) the basis for normalizing interpersonal comparisons of utility, (ii) the greater vulnerability of cardinal reports to strategic manipulation, and (iii) the fact that allocation under budget constraint is a combinatorial optimization problem rather than a vote. The multiple-referenda and judgment-aggregation literatures further establish that aggregating issue by issue — which is what serializing the R:A:D:E dimensions does — generates well-documented paradoxes.

Separately, Posner, Weyl and Buterin (2019), *Radical Markets*, appears as reference [17] but is cited only for a visual introduction to neural networks (pp. 213–220). Section 4.2 dismisses quadratic voting as "a blunt and arbitrary manipulation" without engaging the theoretical justification advanced in that very volume.

Retaining a relevant source while avoiding confrontation with its central argument weakens the manuscript's claim to novelty.

Request: Describe why the existing methods do not qualify as 3D control consensus in the author's sense.

Minor Comments

2. **Density of self-citation (Introduction).** The four-dimensional framework, the EI framework, and the definition of "organizational democracy" all rest on a single prior work (Siegfried 2026), cited at eleven points out of fifty-four references, and itself a Qeios preprint. Independent theoretical support would strengthen the foundation. On the accompanying claim that no formal theory or metatheory of multidimensional coordination is evident in the organization and management literature: the scope restriction is stated, and the claim so restricted is plausible. The difficulty is an asymmetry — novelty is asserted within a delimited field, while the prescription offered in Section 4.3 (cardinal evaluation, the inadequacy of approval voting, collective prioritization) belongs to computational social choice and participatory budgeting rather than to organization studies. At minimum, a passage situating the prescription relative to those adjacent fields is required.
3. **Basis for the reading of Follett (p. 2).** The interpretation that Follett required mathematically intensive "reciprocal relating" is load-bearing for the manuscript's theoretical lineage but rests solely on page citations to Metcalf and Urwick (1940). Secondary scholarship on Follett, or a summary of the passages in question, is needed.

3. **Uncritical treatment of the Internet Computer (Section 3.1).** The statements that only this platform has reached the relevant evolutionary stage, and that it represents over 1,000 person-years of R&D, carry no citation. These are claims about the superiority of a specific project and appear to derive from primary promotional sources. Add neutral sourcing or soften the claim.

4. **Redefinition of "AI" (Section 3.3).** The reframing as "automation intelligence" is a terminological move that runs through the whole paper. The assertion that the three eras identified by Delipetrev et al. (2020) correspond *exactly* to the author's AI/BI/CI quadrants is too strong. Make the correspondence between the two classification criteria explicit.

5. **Register of the Web3 critique (Section 4.2).** Formulations such as "crypto geeks, hoarders, pariah states, and other global capitalism deviants" and "tulipomania" undercut the persuasive force of the empirical material immediately preceding them. That empirical section is the most solid part of the

manuscript; restraint in the surrounding rhetoric would serve the paper's overall credibility. *Priority revision.*

6. **Cryptocurrency count (Section 4.2).** The figure of over 17,000 active cryptocurrencies as of mid-2026, nearly double the 2024 number, is attributed in-text to Statista.com with no corresponding entry in the reference list, whereas other statistics are formally cited. The treatment is inconsistent.

7. **Argumentative placement of the cybersecurity discussion (Section 3.2).** The material on the obsolescence of firewalls and the cost of cybercrime is persuasive on its own terms but weakly connected to the main line of argument about multidimensional coordination. Either make the porosity of organizational boundaries explicit as the mediating term, or compress the section.

8. **Function of the Tesla quotation (end of Section 3.3).** The 1926 interview passage carries rhetorical force but is positioned within the technical vision, where it may be read as evidential. Mark it as rhetorical or relocate it to the Discussion.

9. **Dependence on Figure 1 (throughout).** The text repeatedly invokes the quadrants, hub, and process names of the EI framework without explaining the figure's components self-containedly. For a reader who has not read the prior paper, referents such as "the apex Prioritize process" are opaque. Include a minimal reading guide in the text.

10. **Repeated use of "trivial" (Section 4.3).** Linking relative contribution values to relative compensation, embedding that link in a smart contract, and separating governance tokens from ownership tokens are each described as "a trivial matter." This is inconsistent with the author's own acknowledgment in the same section that averaged ratings lack the precision to drive fair compensation. Related to Major Concern 1, but the wording requires revision independently. *Priority revision.*

11. **Consistency of 3D/4D notation.** N:1:N:N is labeled "3D" while the position of the missing dimension (A or D) shifts between passages. The A→D slide argument in the latter part of Section 3.3 is the most precise reasoning in the manuscript, and the notational instability makes it difficult to follow. A summary table giving the R:A:D:E ordering and the fill state at each stage is recommended. *Priority revision.*

12. **Absence of a temporal axis in the predictions.** For the six unopened doors of Figure 2, ordering is given but the temporal scale is not. Given the manuscript's own account of roughly twenty-year

intervals between stages since 1960, the feasibility of extrapolation is at least worth discussing.

13. **"Blockchain singularity" (Section 3.1).** The term appears once and is used without definition. Define it or remove it.
14. **Generative AI declaration (Declarations).** The statement that no AI-assisted technologies were used is worth noting in a paper whose subject is the coordination capability of AI. This is not a criticism; if the choice was deliberate, it merits comment.

Declarations

Potential competing interests: No potential competing interests to declare.