Towards Project Management 3.0

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Problem

Web 2.0 technologies, including platforms such as Facebook, Twitter and Uber, are characterized by high user interactivity and collaboration, greater network connectivity and enhanced communication channels. The introduction of Web 2.0 technologies challenged and overturned long-held assumptions of project management, including detailed, centralized planning, decentralized execution and centralized control of projects (Levitt, 2011). Instead, project managers began to use a more collaborative, adaptable approach that emphasizes continuous improvement and the ability to respond to change. This approach is known as "Project Management 2.0" (PM 2.0) (Levitt, 2011).

The recent introduction of Web 3.0 technologies may have similar implications for project management. Web 3.0, also known as the "Semantic Web," refers to a network of interconnected data and information from different sources that can be shared and reused across the web. Web 3.0 technologies include machine learning, the Internet of Things, virtual reality (e.g., the Metaverse) and decentralized and distributed systems such as blockchain.

One example of how Web 3.0 technologies change project management can be demonstrated by a new organizational form known as a Decentralized Autonomous Organization (DAO). A DAO is a blockchain-powered organization that can run without any central authority (Wang et al., 2019). The decentralized governance of a DAO is facilitated by a set of self-executing rules deployed with smart contracts on a blockchain to enable automated coordination and bottom-up governance of people and machines. By defining governance mechanisms in smart contracts, DAOs can offer codified rules and transparent processes at the center of organizational coordination. DAOs can evolve as semi- or fully autonomous systems capable of self-operating, self-governing and self-evolving processes (Wang et al., 2022). Alternatively, DAOs can also provide new forms to scale a distributed group of collective actors (Fritsch et al., 2021).

The current number of DAOs is estimated at over 4,000 (Kauflin, J., 2022). DAOs have been used in numerous ways, for example, for financial technology (e.g., Decred[1]), city governance (cityDAO[2]), and or a project to purchase a copy of the US constitution (ConstitutionDAO[3]). Researchers in the built environment have also proposed the use of a DAO for various scenarios (Lombardi & Dounas, 2022) such as construction project delivery (Hunhevicz et al., 2022), architectural design competitions (Dounas and Lombardi, 2019), and autonomous self-owning buildings (Hunhevicz et al., 2021, Wang et al., 2022). Recently, two new organizations, ArchiDAO and Ten Architects, have begun to experiment with the use of DAOs to organize architectural projects.

For the examples above and for many other DAOs, there is little formalized theory regarding the organizational or governance principles needed to execute projects in a Web 3.0

[1] https://decred.org/

[2] https://www.citydao.io/

[3] https://www.constitutiondao.com/

environment. The application of DAOs will require new kinds of governance and organization, which diverges from the common management of today (Sreckovic & Windsperger, 2019). The shift to novel Web 3.0 technologies as coordinating agents renders many assumptions of PM 1.0 and PM 2.0 as obsolete. The coordinators of projects within DAOs must face new challenges. There is a need for a theoretical basis to understand how project management occurs in this new environment. In this paper, we term this new form of management "Project Management 3.0."

To do this, this paper first reviews the principles of PM 2.0. We then conduct two case studies of DAOs and their attempt to initiate, organize, and coordinate projects in the field of architecture. We illustrate the current practice and key challenges facing project managers in these cases. From this, we propose a set of key principles of PM 3.0, as well as the potential tools, training and practices that support successful PM 3.0. We conclude with a set of questions and future research directions to investigate PM 3.0.

Background

PM 1.0 refers to the traditional approach to managing projects. PM 1.0 includes a hierarchical structure and a focus on planning and controlling activities to ensure the successful completion of a project. The project manager plays a central role in defining the project scope and objectives, creating a detailed plan, and monitoring progress to ensure that the project stays on track. This approach is often characterized by a linear and sequential process, with a clear distinction between planning and execution phases (Levitt, 2011).

In contrast, PM 2.0 is a more flexible and collaborative approach that emphasizes adaptability and continuous improvement. PM 2.0 is sometimes known as agile project management and includes methodologies such as Scrum and Kanban. These methodologies emphasize collaboration, adaptability, and the ability to respond to change. In an agile project, the project team works together to define the project goals and deliverables, and then iteratively develops and improves upon these over the course of the project. This approach is often more flexible and responsive than traditional project management, and is well-suited to projects that are complex or involve a high degree of uncertainty (Levitt, 2011).

However, PM 2.0 also faces several challenges in today's world. One core assumption of PM2.0 is real-time, social collaboration. This can work when team members are scattered across a few distinct time zones, but breaks down under today's ideas of fully remote work and globally distributed teams. Levitt describes workarounds such as non-collocated teams using a "webcam pointing at a whiteboard" of sticky notes during a video call (Levitt 2011, p. 208).

PM 2.0 provides participants a voice, encouraging decentralized, bottom up governance and power to the edge, where all employees are empowered. However, giving a voice is not necessarily the same as giving workers a vote on high-level directions of projects. In PM 2.0, major decisions are still often taken at the top of the hierarchy.

PM 2.0 suggests a move from traditional, lump sum contracts to more relational contracts between firms. However, it does not account for the ongoing trend shift towards a "gig economy" where workers work on a piecemeal basis, charging for the completion of specific tasks or units of work (Kaine & Josserand, 2019).

PM 2.0 reimagines the relationships between teams (e.g. power-to-the-edge), and suggests new forms of collaborative relationships between firms (e.g. relational contracting to

incentivize firm participation). However, it does not reimagine the relationship between worker and the equity created, and the resulting implications for work and management. PM 2.0 has some baseline assumptions that projects are carried out within or between firms, but this may not be the case in Web 3.0.

To summarize the above, there are limitations of PM 2.0 that may no longer be relevant in an increasing Web 3.0 world. At the same time, novel organizational forms such as DAOs are increasing, but there is no underlying theory or basis on which to understand the implications for project management and project organizing. Therefore, this work sets out to answer the following two research questions:

- What are the key characteristics of PM 3.0?
- What are the tools, techniques and challenges for project managers to manage projects in an era of Web 3.0?

Research Methodology and Approach

To answer these questions, we conduct a comparative case study of two organizations working to deliver projects in the field of architecture and design services. The first case is ArchiDAO. ArchiDAO claims to be the First DAO by Architects for Architects. The Discord server currently hosts over 500 participants, although some of the leaders indicate that only around 70 participants are active contributors to the DAO. ArchiDAO describes their vision on their website as:

> *Core to the philosophy of the Architecture DAO is the coupling of blockchain primitives with spatial design, both in real physical space and the Metaverse. This integration allows architects of the architecture DAO to embed desirable economic behaviors in the spatial arrangement and create optimized organizational structures that will enable optimized collective designs, for example, for the minimization of Carbon and waste.*

The technical principles of ArchiDAO are described in Dounas et al. (2022) but the way that ArchiDAO manages specific projects is not yet studied.

The second case is TEN Architects. TEN Architects is not currently a DAO, but rather an architectural collective registered in the city of Zurich, Switzerland. Ten in latin is X. The name indicates the firm's principles of inclusivity and decentralized organizational form. The projects in TEN have been conducted through ever-evolving work groups. This operation form highly matches with DAO principles. TEN architects is currently exploring a state of transition, exploring whether they would like to change their organizational form from a collective to a DAO.

The interview process has already begun, and we expect to conduct between 20-30 interviews with the active contributors of these two organizations. At this point, the organizations have several projects ongoing, and it is our intention to select and follow a specific project for each. Most interviews will be recorded and transcribed. The content will be coded and systematically combined to abduct possible themes and principles. Data will be triangulated with an observation of live team meetings and review of the Discord channels of both organizations.

Key Findings

Data collection is currently at an early stage, so here we include some first propositions of our findings.

Preliminary Characteristics of PM 3.0

	PM 1.0	PM 2.0	PM 3.0
Core Assumption	Project Managers can develop a detailed plan that is valid for duration of project	Project Managers assume baseline of plan will change over time	(not yet determined)
Power Distance	High	Low	None (peer-to-peer)
Motivation	by monitoring of hierarchy, who then reward or sanction	by social status and reputation within team	By equity and participation, also by social status and vision of DAO
Financial Arrangements	Lump-Sum Bid	Relational Contracting	Combination of Piecemeal & Project/DAO equity (through tokenization)

Preliminary Challenges of PM 3.0

Dealing with information overload. It is difficult for everyone to communicate about everything. Hierarchies are useful to manage and reduce the amount of info that all participants need to take in. PM3.0 requires the ability for DAOs to deal with information overload in asynchronous work. Using selective subscription to certain channels of interest on the Discord platform is one way, but project managers need strategies to focus information exchange within projects.

Setting a direction in a highly pluralistic environment. The DAOs are characterized by very little formal hierarchy. Project management requires coordination of collective action. To do this, decisions can be guided by voting, with rights derived by token holders. Some organization is derived through use of a channel on discord. It can be difficult to “guide the hive” for sustained coordination to achieve complex project goals. For this reason, Ten Architects separates their “flash” design activities from their more complex design work that is done by the main members of the collective.

Managing asynchronous work. DAO work is highly asynchronous, as participants come from multiple time zones. Project Managers need new approaches to manage this. The interest of participants might be short and immediate, but it is challenging to sustain long-term action.

Engagement across permeable project boundaries. The DAOs have very permeable boundaries. Many users are welcome to join and there is a low barrier to entry. Participants can

express interest in a project but it can be difficult to know at the early stages of the DAO if they have the expertise to deliver. For example, in ArchiDAO, many participants are very early in their career, and managers need to ensure they have the expertise to deliver on expectations.

Implications and Conclusions

At this early stage, we observe two potential metaphors to understand the new role of the project manager:

- *Project Manager as politician.* In the face of plurality, the project manager cannot use hierarchy to guide a team. Instead, the project manager can be understood in a similar way to a politician. They set a vision for the project, campaign within the rest of the DAO in order to gain votes to initiate the project, and continuously encourage and rally participants to work on *their* project among the many other project options to work on.
- *Project Manager as temporary queen bee*. The project manager takes on a temporary role of "queen bee" for a specific project. They then receive social authority within that project to "direct the hive" or coordinate the actions of the swarm.

Despite fears that Web 3.0 technologies might replace project managers with artificial intelligence, our findings suggest that project management could become more important in the future. The attention of a distributed workforce can be limited. There is a need for managers to break down tasks into smaller forms or risk losing the cohesion of the overall system. The need for systems integration perspective becomes more important. Furthermore, there are questions on how projects can and should be managed with a perspective of project stewardship (Hall & Bonanomi 2021) and organizational steward-ownership (Makonnen 2020).

The findings described above are in very early stages and should not be taken as conclusive, but rather as an early set of propositions to guide future thinking. They will be further developed with the full analysis of this work and can be presented at the conference.

References

Dounas, T., Voeller, E., Prokop, S., & Vele, J. (2022). The Architecture Decentralised Autonomous Organisation: a stigmergic exploration in architectural collaboration. http://dx.doi.org/10.52842/conf.ecaade.2022.1.567

Dounas, T. and Lombardi, D. (2019). "Blockchain grammars: designing with DAOs". In Haeusler, M.H., Schnabel, M.A. and Fukuda, T. (eds.) Intelligent and informed: proceedings of the 24th International conference on computer-aided architectural design research in Asia (CAADRIA 2019), 15-18 April 2019, Wellington: New Zealand. Hong Kong: CumInCAD [online], Volume 2, pages 293-302. Available from: http://papers.cumincad.org/data/works/att/caadria2019_647.pdf

Fritsch, F., Emmett, J., Friedman, E., Kranjc, R., Manski, S., Zargham, M., & Bauwens, M. (2021). Challenges and approaches to scaling the global commons. Frontiers in blockchain, 4, 578721. https://doi.org/10.3389/fbloc.2021.578721

Hall, D. M., & Bonanomi, M. M. (2021). Governing Collaborative Project Delivery as a Common-Pool Resource Scenario. Project Management Journal, 52(3), 250–263. https://doi.org/10.1177/8756972820982442

Hunhevicz, J. J., Brasey, P. A., Bonanomi, M. M., Hall, D. M., & Fischer, M. (2022). Applications of blockchain for the governance of integrated project delivery: A crypto commons approach. arXiv preprint arXiv:2207.07002.

Hunhevicz, J., Wang, H., Hess, L. & Hall, D.M., (2021). no1s1 – A Blockchain-based DAO Prototype for Autonomous Space. In D. Hall and J. O'Donnell (Eds.), Proceedings of the 2021 European Conference on Computing in Construction (pp. 27-33). European Council for Computing in Construction (EC3). http://www.doi.org/10.35490/EC3.2021.185.

Kaine, S., & Josserand, E. (2019). The organisation and experience of work in the gig economy. Journal of Industrial Relations, 61(4), 479-501. https://doi.org/10.1177/0022185619865480

Kauflin, J. (2022). "DAOs Aren't A Fad." Forbes. Accessed December 13, 2022. https://www.forbes.com/sites/jeffkauflin/2022/02/03/daos-arent-a-fad-theyre-a-platform/?sh=376fdd9d19d0.

Levitt, R. E. (2011). Towards project management 2.0. Engineering project organization journal, 1(3), 197-210. https://doi.org/10.1080/21573727.2011.609558

Lombardi, D., & Dounas, T. (2022). Decentralised autonomous organisations for the aec and design industries. In Blockchain for Construction (pp. 35-45). Springer, Singapore. https://doi.org/10.1007/978-981-19-3759-0_3

Makkonen, J. (2020). "Steward-Ownership Is Capitalism 2.0." Better Sharing (blog), September 23, 2020. https://medium.com/bettersharing/steward-ownership-is-capitalism-2-0-76a1c50a6d88.

Sreckovic, M., & Windsperger, J. (2019). Decentralized Autonomous Organizations and Network Design in AEC: A Conceptual Framework (SSRN Scholarly Paper No. 3576474). https://doi.org/10.2139/ssrn.3576474

Wang, S., Ding, W., Li, J., Yuan, Y., Ouyang, L., & Wang, F. Y. (2019). Decentralized autonomous organizations: Concept, model, and applications. IEEE Transactions on Computational Social Systems, 6(5), 870-878. https://doi.org/10.1109/TCSS.2019.2938190

Wang, H., Hunhevicz, J. J., & Hall, D. (2022). What if properties are owned by no one or everyone? foundation of blockchain enabled engineered ownership. In Proceedings of the 2022 European Conference on Computing in Construction (Vol. 3). University of Turin. https://doi.org/10.35490/ec3.2022.213