Exploring Meta-Design in Decentralized Autonomous Organizations (DAOs)

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The emergence of Web 3.0, characterized by its decentralized nature, has led to the proliferation of Decentralized Autonomous Organizations (DAOs). This research delves into the evolving role of design within DAOs, specifically focusing on the concept of meta-design. Meta-design encompasses both the final design output and the collaborative design process itself.

Employing a multi-case studies approach, the research examined design practices within an Astrogirls NFT DAO and three DAO projects under Kambria's Open Innovation Platform. They are Mine Clearing Robot DAO, Ocean Clean Up Robot DAO and Underwater Conservation Robot DAO. Semi-structured interviews were conducted with four design contributors and four non-design contributors from four project DAOs to understand their roles and perspectives. The research further investigated the participatory nature of design within DAOs, where token-based voting systems empower users to actively contribute to design governance and decision-making processes related to product design.

Unlike non Web 3 organizations, Web 3 ones do not have a workplace hierarchy or functional categorization. Instead, the community is shared based on interest and belief. Therefore, there is no such monthly remuneration but designers can get income from work contribution towards the DAO project. As Web 3 encourages community engagement, the decision making process is not made solely by C level but by members as per protocols. In traditional organizations, design work is done by a design professional team but in Web 3, designers or design contributors open the platform for users to become designers as well. This research contributes to a deeper understanding of how meta-design empowers collaborative processes and reshapes design practices within the dynamic landscape of Web 3.0.

Keywords: Web 3, Decentralized Autonomous Organizations, Design Management, Role of designers, Metadesign

1. Introduction

This study is significant for designers as new technology of Web 3 disrupts the internet and opens a new space for the mainstream internet users to co-inventors and co-creators. Therefore, designers will need new skill sets that match with the Web3 project innovation. Web 3 also empowers individuals to start focusing on collaborative design problems and issues before they contribute finance or labor in the Web3 project as design is one of the successful factors. Therefore, this study has been narrowed down into three objectives, including articulating the scope and nature of actions that designers in Web 3 organizations do, identifying the skills associated with these actions; skills include design planning, design research, managing the design contributors and analyzing and comparing design involvement in Web 3 vs none-Web 3 Organization. Cointelegraph wrote that in the DAOs, the governance is based on the community while in traditional organizations, the governance is based only on board of directors, executives or investors. Therefore, the decision power is collected in the sole party and changes on the company structure can be based on it. In DAOs of Web 3, voting of the members is mandatory for making any changes as per protocol of the DAOs.

In addition, a design ladder also can show the impact of design in the non Web3 organization. In the article Measuring the impact of design, service design and design thinking in organizations on different maturity levels, the author Bjorkland, Hannukainen and Manninen (2018) stated that there are four levels of design involvement, namely design involved only as contractual work, design as form-giving, design as process and design as strategy. In mature traditional organizations, design can provide an important impact on business strategy by taking the role of senior ranking in the organization or advising on entering new regional markets. In Web 3, this study assumes that design goes beyond the hierarchy structure of the workforce, leading market segmentation or identifying the desired product or solution.

2. Background and terminologies

Decentralized Autonomous Organizations (DAOs) are a key use case for Web 3.0, as they embody its core principles of decentralization, transparency, and immutability. The Internet has evolved from Web 1,2 and now 3. Web 1 was composed of static web pages and informational websites. Web 2 is made of social media platforms, wiki and blogs. Web 3 refers to the vision of a decentralized internet where data ownership, privacy, and security are prioritized, facilitated by blockchain technology and decentralized protocols. As of January 2024, there are 30 million users in Metamask as per its website and it is one of the most commonly used crypto wallets. It means that these users are involved in Web 3 projects and use it as instruments to invest in a meaningful cause or have interests in the emerging technology to solve problems, such as limited resources on connectivity and freedom to access to technology.

Meta Design is an emerging conceptual framework aimed at defining and creating social and technical infrastructures. In Web 3, design involves an end-to-end product life cycle; therefore design covers both process and product. A Web 3 design process manages the design process and final product design via a decentralized structure of work and empower users and creators in an innovative way in a self-organizing team. Therefore, design connects stakeholders in a meaningful way in terms of the cause they believe in. Stakeholders are mapped as below Figure1. A user can belong to all three groups of stakeholders. Incentives of work contributors can be provided as tokens and a contributor can in turn become an investor. In this study, designers can mean anyone who contributes design work in the project.

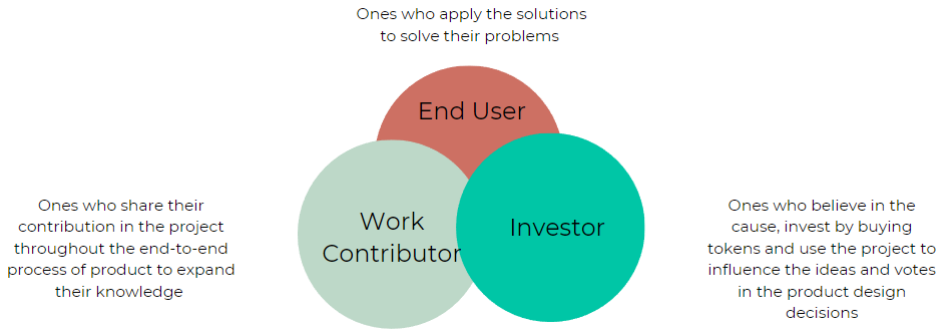

Figure 1 illustrates the relation between stakeholders in the DAO structure.

3. Methodology

Case study method has been chosen to approach this research as it is difficult to gather a wide range of Web 3 projects within the limited time and it requires an in-depth understanding of each project by engaging stakeholders at different layers. The researcher is the primary instrument of the study. First, the researcher investigated the industry by following multiple DAOs projects, reaching out to experts and community and studying fundamental technicals of the technology. As a second step, the researcher participated in Astrogirls DAOs and had chosen it as the first case study and because of its failure after the first few years of establishment. Finally, after having monitored the ups and downs of the crypto market, to select relevant case studies based on the research focus, the researcher selected three project DAOs in Kambria's open innovation platform, which is still an active one. In Kambria, there are more mature communities and cohesive DAOs projects. Although this research has been concluded by the research timeframe, the selected three DAOs' project case studies are still ongoing. .

Three research activities had been done in each case study to collect the research data:

3.1. Interview Process

The case study data was collected via semi-structured interviews carried out in three months. It has two sets of questionnaires, one for design contributors and another for non-design contributors. The questionnaires explore tasks and responsibilities of designers and design contributors, design processes, behavior and actions of design functions and influences on decision-making processes. Respondents were chosen due to their contribution of work which were designers or membership of the organization. Due to the transparent nature of Web 3, interviewees were invited to share their responses and recognized by their contributions in the DAOs project, not by their educational, professional, and/or personal background. Their contribution could be validated via their wallet address since in Web 3, all activities related to financial investment, communication between members, work contributions, transfer of tokens or any changes in blockchain can be traceable.

After getting transcript and quotations from the interviewees, their personas were mapped to understand their wants, involvements, and perceptions. To reflect the meaning, key phrases are extracted and summarized by the method of content analysis.

3.2. Participatory Experience

The researcher had been involved in Astrogirls NFT as an investor, member and contributor. The researcher bought a NFT piece with Ethereum. The researcher contributed design sharing ideas on visual design of the piece. In Kambria, the researcher was only a follower of the project. The researcher was involved by collecting credits to participate in DAO council, asking questions and sharing feedback in project announcements in the Townhall Zoom Session.

3.3. White Paper Review of DAOs in each DAO project

White papers are the foundation of DAOs, sharing info on technical details, roadmaps, tokenomics and governance, use cases and applications. The purpose of the white paper is to encourage the community to invest, inspire engineers and contributors to come on board and share the roadmap of the project and open room for further evolution and community involvement. The structure consists of mission, role and scope of the work, implementation in DAO model, financial framework, tokenomics and smart contract templates which share technical details for developers.

4. Result

4.1. Contextual Analysis of Each Project

4.1.1 Astrogirls NFT

Astrogirls NFT was initiated in November 2021 when NFT arts were considered to be the innovative trend of the future. A group of young women from the US and Singapore had got together to launch a NFT project and established a DAO for the project. There was a lot of excitement and support from the NFT art community. They have included celebrity endorsement and investors. They had great ideas to include everyone in the design process of branding, design structure of NFT product and strategy of expansion. Their cause was to encourage more women to be interested in Web 3. Web 3 has been a space where more men take the lead and create a masculine atmosphere. Therefore, this NFT project aspired to have feminine themes, colors and topics to create an inclusive environment for women.

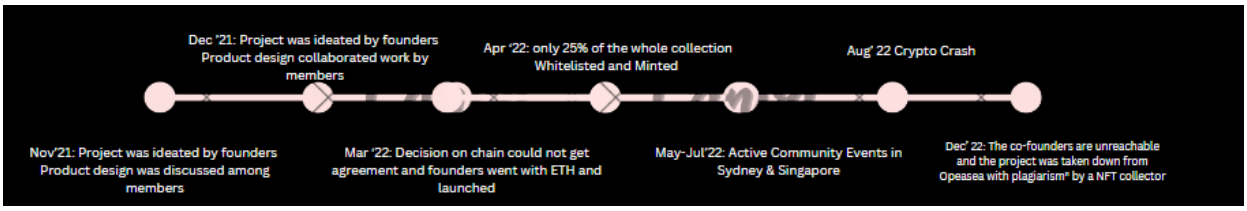

Figure 2 illustrates the timeline of involvement in the Astrogirl NFT project.

Major reasons for this Web 3 project failure include not having clear design strategy and goals, not having good art quality, not clearly describing utilities of the product and not having a good quality of marketing and Community Engagement.

4.1.2 Kambria

Kambria is an open innovation platform for DeepTech with the mission to shape the future of technology where technology is open and contributes more to society. Kambria has launched its DAO projects running on XDAO, a third party platform for DAO builder and management. Kambria Tokens are used for interactions for solution seekers, innovators, manufacturers, and members. Three DAO projects under Kambria were chosen for the case study.

First, the Mine clearing robot DAO Project works on combining robotics and gamification to develop remote control robot solutions, aiming to lessen the hazard posed by landmines and share stories about life impacted by landmines. Secondly, Ocean cleanup DAO Project builds robots to help with cleaning waste on the beach and shore by using remote controlled or autonomous technologies. It includes gamification to apply in trash identification and data collection. Finally, the Underwater Conservation DAO Project develops underwater conservation robots, also referred to as remotely operated vehicles (ROVs) or underwater drones, which are essential to marine conservation initiatives. Solutions with these new technologies are built with DAO structure to welcome new ideas and investment; therefore, transparency and reliability are needed in implementation.

4.2. Analysis of Design Engagement

By referring from the case studies, the study can be summarized into involvement of design as per the below table.

Astrogirls Designer Astrogirls Non-design	Design involves branding, causes, partnership with other NFT projects and collaborating with the internal developer team. Visual and aesthetic design of NFT pieces and Web 3 Education
Mine Clearing Designer Mine Clearing Non-Design	Design is used in MVP product, method for example, real-time gaming, AR Critical analysis and model-making design
Underwater Designer Underwater Non-Design	Aims to involve in commercialization and partnership (still in planning stage of the project)
Ocean Designer Ocean Non-Design	DAO strategy- stage of development process, gamification design, sustainable and environmental-friendly design

Table 3 illustrates design activities that discussed, shared and contributed in respective projects according to interviewee respondents.

Design is applied in workforce management between users, creators, developers, and investors. Tokens are compensated as per contribution under the protocols of the DAO. Protocols serve as rules and regulation in the project that has been set by the co-founders and founding members. Individuals who have the voting power can decide whose contributions will be applied in project and how much they should be rewarded in tokens or NFT pieces. Voting power which comes from financial power is distributed among members. Design is applied in strategy planning in emerging technologies as it involves in visionary product design and market trend analysis.

Therefore, design is categorized into three parts of involvement namely, as functional specialism, as a part of a multidisciplinary team, as process and thought leadership. Below figure compares design involvement between non Web 3 organizations and Web 3 organizations.

	Non Web-3 Org	Web 3
Designing organization structure	workplace hierarchy between design directors and designers Design function or cross functions Salary based income	Community based engagement Work contribution based income Shared interest/belief
Design working team	Design work within the design professional team	Establish the open platform that users to become designers

Design Research and Testing	Design research done such as surveys/AB testing etc by designers and users give feedbacks and researchers gather and designers iterate	Designing the whole process together: Collaboration the design activity at different levels such as an individual, group or community
Decision making process in product design	C level decides the final design and launch.	Decision done by protocols of members in the DAO and as per token-based quorum voting mechanism.

Figure 4 illustrates how design related work differs between Web 3 organizations and Non Web 3 organizations.

4.3. Designers or Design Contributors' role in Web 3

Designers guide users and provide space to create and modify the product or solution to have greater fit for the users between the foreseen future at design time and what emerges at the use time. Knowledge in the new technology is not limited by the core contributors or design leadership anymore. Anyone with extensive knowledge or experience can share and start contributing without going through a formal hiring process. Therefore, designers' roles in Web 3 will not be limited by knowledge within the core team unlike ones in non-Web3.

Users' involvement also transforms in Web 3. Users participate both at the foundation stage of design time, critique and other supporting feedback while learning to become designers and contribute design work. In non- Web3 organizations, users' participation can be limited only at testing or feedback stage. Designers also engage to investors directly in Web 3 organizations and get direct feedbacks and guidance from them. NFT collectors, investors, can interact with design contributors. Also, designers aim to involve in business models, commercialization, and partnership of the project. For example, in underwater conservation DAO, the designers brainstorm and engage with local partners to customize robots.

One of the most highlighted differences of designers in Web 3 is about social capital. "Social Capital" in social networks of the designers or design contributors are recognized and rewarded for their design contributions in democratic way. If designers or design contributors have many followers on X and Discord, the members may consider them as reliable and knowledgeable and they prefer to invest in projects that have specialists who are well-spoken in digital space. Also, another benefit of co-creation is building trust and value-feelings of each other make members experience emotions and the designers gather trust from users, followers, and members of the project. Discord and X's posts and engagement are terms as social capital or one of the social capital indicators.

4.4. Assumption between Astrogirls vs Kambria

After studying four DAO projects in two platforms , the below assumptions can be briefed to understand the failure of Astrogirls NFT project. Kambria is still thriving and expanding into more DAOs projects due to its well-structured and clear mission.

	Astrogirls	Kambria
Design Research	Limited proper research due to bootstrapping nature of the project	In-depth research on the issues and problems by surveys and contextual inquiries

Contribution	Allow individuals to contribute without structure and Lead designers did not consolidate and validate the design ideas by the members	prefer the individuals to join as a group to contribute E.g- Hiring a third party developer team and individuals who are interested can join the team
Roadmap and strategy	not have a proper roadmap and timeline	Clear roadmap in website and communication channel

Table illustrates how information about design research, contribution, road map and strategy between Astrogirls and Kambria are compared.

5. Conclusion

Designers or design contributors in this study play a vital role in guiding the principles of collaborative design and crafting it into the primary mission of the DAO project. The principles cover business models, strategy planning, implementation of the solution and design decision-making process of the distributed network. By keeping awareness of the decentralized nature of Web 3 projects, designers can shape the collaboration between collectors and founders. Dynamic changes of the market can have an impact on the success of the project. Since technology is still state-of-the-art, it is difficult to find competent and reliable specialists who can explain and share knowledge about the technology and involvement.

The role of meta design relates to motivation on collaboration and social accumulation between the members of the DAOs is crucial . Although it supports socially collective creativity, it has challenges on technical as well as social domain, such as tension between standardization and improvisation, integration between designers and users, effective ways of supporting meaningful tasks, and the need for new integrated design space.

Recommendation

This study aims to improve advancement of Web 3 and encourage designers or design contributors to adopt user-friendly design for products. Three recommendations for design best practices to improve better involvement in Web 3 are as below.

Design should provide clarity of the DAO project. It is to notify on complex sections and features of the products, not just announcements but also reports. Design should provide familiarity in the solution. It is to continue creating awareness about Web 3 projects and governance models. Design should create transparency in the business process. It is to share info about transaction time, fees and history.

As the role of design in Web 3 requires different skill sets from one in non Web3 does, design gives power to the open distributed channel yet influences soft power. Since the DAOs' structure gives distributed power to a larger group of people to decide and contribute, it can have the possibility of lower design work quality. In comparison with non Web3, non Web 3 leaders can choose and form the design team under their close supervision and build the team structure as they desire. Therefore, in Web 3, in contrast, leaders need to provide more guidance with idealistic leadership style and an encouraging attitude to innovation.

This study can be built on other different types of Web 3 projects such as decentralized financial application (Defi) which are more commonly used for payment, investment and financial activities. Also, by involving crypto exchange which are enthusiastic to invest on user education might be keen to support this study as this study can be beneficial for them. The study can be extended with quantitative research to support the theoretical framework and qualitative research that the current study has been done.

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References

[1] Hackl, Cathay, Lueth, Dirk, Di Bartolo, Tommaso, Arkontaky, John, Sui, Yat. *Navigating the Metaverse: A Guide to Limitless Possibilities in a Web 3.0*

World (1st ed.). Wiley.

[2] Ball, Mathew. *The Metaverse and How It Will Revolutionize Everything* (1st ed.). Liverright Publishing Corporation.

[3] Fischer, Gerhard, Giaccardi, Elisa (2006). Meta-Design: A Framework for the Future of End-User Development, *End User Development* (pp. 427-257). Retrieved April 20th, 2023, from 10.1007/1-4020-5386-X_19.

[4] Vygotsky, L. S. (1991). Genesis of the higher mental functions. In P. Light, S. Sheldon, & M. Woodhead (Eds.), *Learning to Think* (pp. 32–41). London: Routledge.

[5] Bjorklund, T., Hannukainen, P., Manninen (2018). Measuring the impact of design, service design and design thinking in organizations on different maturity levels, *ServDes2018*. Milano: Scuola Del Design Departtimento De Design.

[6] Wu, MingChang (2013). Design innovation the role of design in combining process and product innovation. *2013 IEEE Tsinghua International Design Management Symposium.* IEEE. Retrieved November 20th, 2023, from 10.1109/TIDMS.2013.6981239.

[7] Perks, Helen, Cooper, Rachel F.D, Jones, Cassie. (2005). Characterizing the Role of Design in New Product Development: An Empirically Derived Taxonomy. *Journal of Product Innovation Management*, 22(2). Retrieved December 23rd, 2023, from 10.1111/j.0737-6782.2005.00109.x.

[8] What is Web 1.0, Web 2.0, and Web 3.0? Definitions, Differences & Similarities (2023, Oct 16). *Simplilearn*

[9] Design principles for web3 (2022, Jan 10). *Medium*

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