AI DAO White Paper

Creating Decentralized AI Infrastructure and Builder Community of the Future

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Contents

Executive Summary

The advance of AI/ML-based technologies in recent years, such as deep learning, has enabled a wide range of applications. According to PWC, by 2030, artificial intelligence could contribute up to $15.7 trillion to the global economy. Trained AI models are the crux of AI applications. Traditional Web2-based approach for creating and managing the life cycles of AI models and applications is facing serious growth challenges as the cost to train these models has risen rapidly in recent times. To take advantage of the synergy between AI and DAO-based design, AI DAO aims to enable a revolutionary new way for AI development and governance to sustain the rapid growth of AI in the coming years.

By introducing DAO-based decentralized finance and governance mechanism to AI, AI DAO is ideally suited to support a sustainable and community-oriented pathway for creating and managing AI projects and applications (for both Web3 and Web2). AI DAO is more engaging in the process of value creation of AI-based applications than the traditional approach of AI development. It incentivizes the stakeholder and the builder community of AI with tokenomics. The participants of AI DAO can contribute their own areas of expertise and work together as a community to create better AI models and applications as collective efforts. Consequently, its DAO-based design can facilitate high-value growth to the broad stakeholder community of AI and Web3.

The key value propositions of AI DAO comprise: *decentralized AI governance, automation of business processes for AI value co-creation as collective efforts, integration of tokenomics with AI, a platform for experimenting with AI Fi, and integration of Web2 and Cloud resources for Web3 AI. The AI DAO model enables an agile and rapid innovation approach for AI, lowers the barriers and overhead for early-stage AI/ML projects, facilities ecosystem collaboration and value co-creation, and achieves faster return of value to the*

stakeholders. The endeavor of AI DAO is to lay a decentralized foundation for the future of AI, which represents a quantum leap to unleash AI's power to deliver the greatest benefits to mankind in the coming years.

1 Mission Statement: DAO for AI and ML

Over the recent years, AI has created widespread interest around the globe for its potential to transform human society. The advance of AI-based technologies like deep learning has enabled a wide range of applications such as speech translation/transcription, computer image understanding, speech generation, image generation, text generation, protein-folding predictions (e.g., Alphafold/Alphafold2), online recommendations, chatbots, industrial robot automation, financial modeling, asset portfolio management, face recognition, cyber security defense, to name just a few. Certain fields of AI, like ML-based content creation, have gone through major breakthroughs and evolved in the last few years to the level of maturity that is ready to see rapid commercialization and adoption in the coming years. Some of these areas may experience high growth, even a 100x increase in market value in a relatively short period.

1.1 AI Growth Challenge

At the center of these AI applications are trained and data models. These trained AI models are considered as the most valuable assets because of their potential to support a diverse and large number of impactful applications. One example is NLLB-200 from Meta AI. It is a model that can translate 200 different languages. When writing this white paper, Meta AI provides up to $200,000 of grants to nonprofit organizations for real-world applications for NLLB-200. A trained AI model can learn tasks it has not been trained to, for instance, OpenAIs GPT-3. AI model can be applied to generate new data. The image generation model DALL-E is such an example. It can generate images from scratch, given a written prompt. Even more fascinating, it can perform gen-

eration tasks that it has not been trained on without the need for examples. The general AI model, called M6, is another example. DAMO Academy develops the model with multi-modal and multi-task functions. According to DAMO Academy, M6 could be used widely across the fields of e-commerce, manufacturing, literature and arts, scientific research, and more. All the AI models described above share one thing in common: their sizes. GPT-3 has 175 billion ML parameters. DALL-E is a multimodal implementation of GPT-3 with 12 billion parameters. The AI model Wu Dao has 1.75 trillion parameters. M6 has increased the number of parameters from 1 trillion to 10 trillion. These AI models are big, and they are becoming bigger. Consequently, it becomes increasingly expensive to train and own these models. The Allen Institute for AI puts the average cost to train an AI model at $1 / 1000 parameters. As the parameters increase, so does the cost to train these models.

According to estimate, [SPS20], a billion parameter model could have a price tag of about $1M.

- $2.5k - $50K (110 million parameter model)
- $10k - $200K (340 million parameter model)
- $80k - $1.6M (1.5 billion parameter model)

This means that anytime soon, only very few big tech companies can afford the cost of training such large AI models.

1.2 Need for Agile, Decentralized and Community-Driven Approach for AI

Between 2014 and 2021, AI startups worldwide attracted over one hundred billion U.S. dollars of investment. In 2020, AI startups attracted about 36 billion U.S. dollars in investment. In the first six months of 2021, this figure was surpassed and reached 38 billion U.S. dollars [Sta]. On the other hand, based on the published data, there is still a long way for the AI startups to profitability. From generating revenues and making profits aspect, AI startups are not different from other Unicorn startups. However, one could raise the question in this historical time with so many breakthroughs in AI/ML-based technologies: could AI startups perform better in creating value for the stakeholders

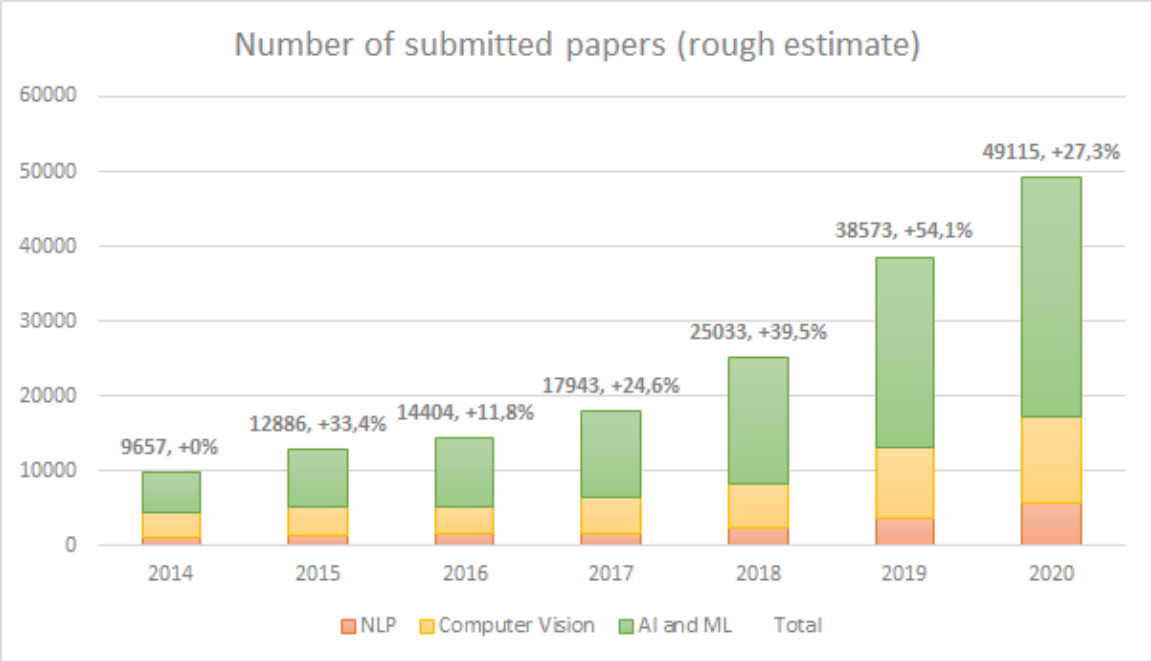


Figure 1.1: Number of submitted papers in the main machine learning conferences per year (data source:ăhttps://we.tl/t-UvCS7dfIs4).

and generating returns for the investors at a pace exceeding the industry average? The answer may lie in decentralizing AI governance, value creation, and stakeholder community management - in other words, DAO-based AI.

AI has recently seen an explosion of innovations as an emerging and new sector. Using one benchmark metric, there has been a sharp increase in the number of papers submitted to the top AI/ML conferences, such as AAAI, IJCAI, NeurIPS, ICML, ICLR, and so on. The growth rates between 2014 and 2020 are shown in the figure above. With such a level of intensity in AI/ML research and innovations, one should anticipate similar growth in productivity and value with AI-powered applications.

Our bold theory is that the current Web2-based funding mechanism, governance model, and AI development process may hinder AI's growth. A decentralized, agile, collective, and community-driven approach could be more suited to unleash the growth potential of AI. As an emerging area, AI needs the brain power of the community worldwide to discover new killer applications, enhance AI algorithms, build ever-improving AI models, and identify new revenue potentials.

Guided by the principles of tokenomics, DAO, and Web3, AI DAO is a project that aims to provide a decentralized approach for AI as an alternative to the current centralized and Web2-based approach for developing AI applications, training, and managing AI models.

AI DAO applies the concept of DAOs for investing and capitalizing AI models and applications. It makes the process of investing, training, and managing AI models more accessible, decentralized, transparent, and community oriented. Leveraging the success of DAOs in many use cases, such as DeFi and NFT investments, AI DAO is designed to offer a sustainable, open, decentralized, and futuristic approach to AI.

1.3 The AI DAO Mission

AI DAO is set up to bridge two major industries of computing that have the most potential to transform the global digital world in the coming decade, Web3 and AI.

The mission of AI DAO is to make AI development and ownership globally decentralized. AI DAO provides a DAO-based approach to large AI models and commercialization of these models in contrast with the current landscape of AI dominated by the big tech companies.

Table 1.1: AI DAO

	Current	AI DAO
Investment	By big tech	Decentralized
Business model	Big tech	Purpose-built DAO (donation-based, revenue sharing based, consortium-based, etc.,)
Ownership	Big tech	By the DAO contributors/token owners
License	Set by big tech	Defined by the DAO governance
Governance	Big tech	Community
Growth model	Led by big tech	Community based
Incentives to participants	Low to medium	High
Computing infrastructure	Cloud	Cloud3 [1]

[1]The mission of Cloud3 is to open Cloud-based infrastructures to Web3 and dApps, and integrate the traditional cloud stack with a new control plane based on tokenomics.

Developing large AI models is a complex task. Besides the challenge of rising costs, the road is full of hurdles like data acquisition, data instrumentation, efficient use of computing resources, new ideas from the AI researchers and domain experts, identifying killer apps of the AI models, fine-tuning the models, etc. AI DAO is ideally suited to tackle these challenges as it is built around the global community of AI stakeholders and builders. Participants of AI DAO can contribute their own areas of expertise and work together as a community to create better AI models and applications as collective efforts. The DAO-based approach ensures that the participants will have a vested interest in the AI DAO. The decision-making process of AI DAO is transparent to its community. Contributors are incentivized and rewarded with the design principles of tokenomics. As a result, they will be more engaged with the community. In addition, AI DAO manages the value chain of the AI models and applications. The value is tracked using smart contracts. Each AI DAO has its own treasury managed by its stakeholder community. The participants are rewarded based on their contributions. Smart contracts are applied to manage the value chain of AI. Revenue and income can be shared among the contributors using the AI DAO treasury governance.

AI DAO is a revolutionary framework for AI. It fundamentally distinguishes itself from the Web2-based AI businesses like ML workflow management. AI DAO is Web3 and DAO based. AI DAO fully embraces the principle of tokenomics, while the existing AI governance is mostly based on the traditional Web2 business model. AI DAO provides governance for AI model life-cycle management and supports the DAO-based value-creation process for AI.

By 2030, artificial intelligence could contribute up to $15.7 trillion to the global economy [For]. The potential of AI DAO cannot be overstated, as it offers a unique approach to address the AI's growth challenges.

To conclude, AI DAO is a decentralized and community-oriented approach for managing the AI governance and creating AI applications. The DAO-based approach is geared toward AI's viral and sustainable growth. Its DAO-based design can bring high growth to the stakeholder community and achieve record-level returns of value to its stakeholders.

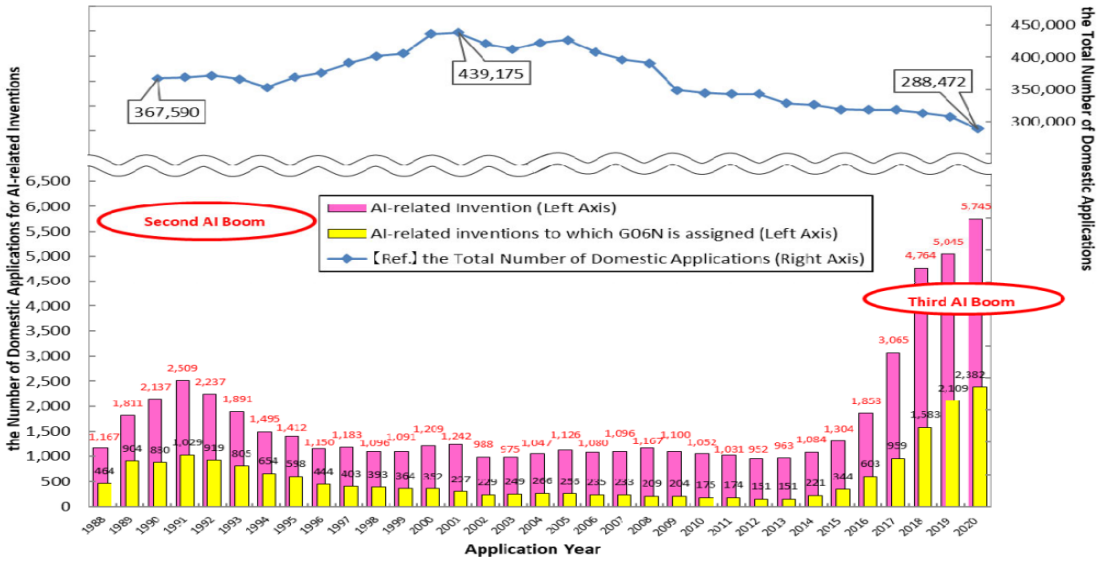


Figure 1.2: We are at the beginning of the 3rd AI boom (AI applications to the patent office of Japan over time). Data source: Japan Patent Office. [2]

1.4 Why Now?

1.4.1 The Third Boom of AI

We are at the beginning of **the third boom of AI**. The marriage of AI and crypto as described in this white paper, is a perfect opportunity for BitDAO and the BIT ecosystem to become the leader of Web3 AI.

1.4.2 AI Is the New Mining

According to a report by the Center for Security and Emerging Technology at Georgetown University [3], with the current trend, the cost of cutting edge AI models is expected to exceed the U.S. GDP between 2026 and 2027 (assume 3% GDP growth rate).

Over the last few years, the creators of crypto tokens have been searching

[2] https://www.jpo.go.jp/e/system/patent/gaiyo/ai/ai_shutsugan_chosa.html

[3] AI and Compute. https://cset.georgetown.edu/wp-content/uploads/AI-and-Compute-How-Much-Longer-Can-Computing-Power-Drive-Artificial-Intelligence-Progress.pdf

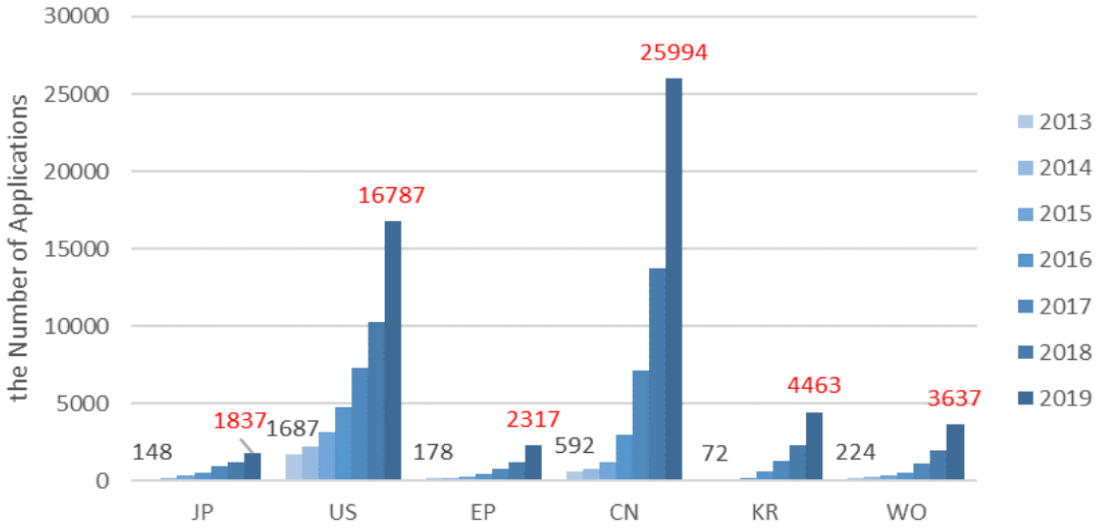
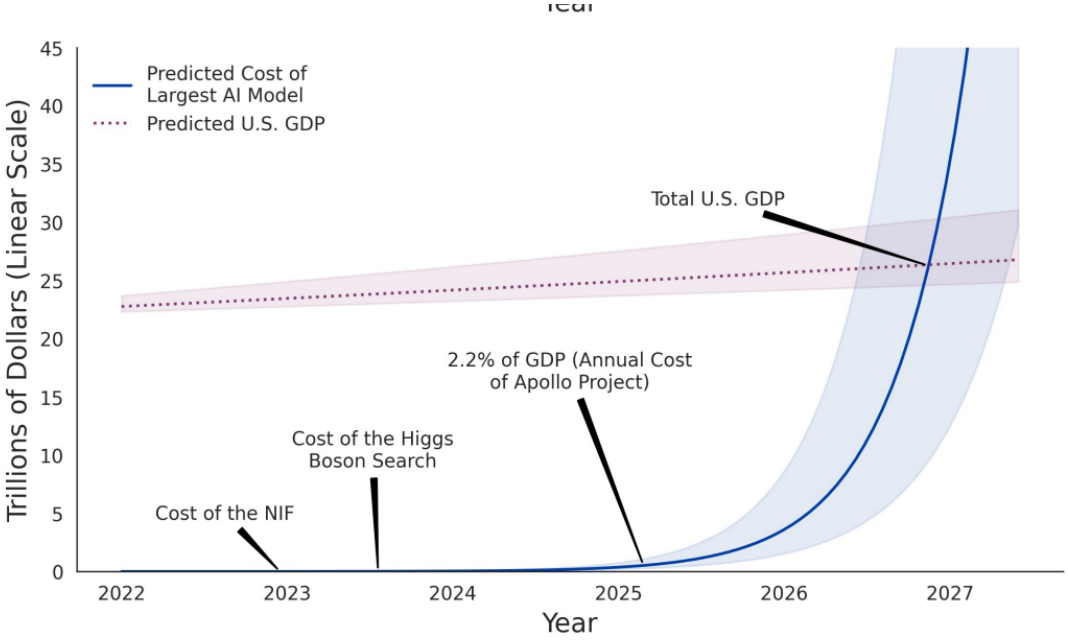


Figure 1.3: AI applications in different regions. Country codes in the figure stand for JP: Japan, US: United States, EP: Europe (EPO), CN: China, KR: Republic of Korea, WO: PCT international application (regardless of the nationality of applicants). Data source: Japan Patent Office.

for adoption and utility values. To provide a reference point, in November 2022, OpenAI released ChatGPT. As of Jan 27, 2023, ChatGPT has been used by over 500 million people worldwide [4]. To put this into perspective, what if OpenAI had adopted tokenomics in the design of ChatGPT? What would be the utility value of ChatGPT?

Beyond a shadow of a doubt, AI is a one-time gift to the crypto world, an unmatched opportunity for those who can recognize and seize this opportunity.

[4] https://yaledailynews.com/blog/2023/01/27/yale-experts-explain-chatgpt/



Source: CSET. Note: The blue line represents growing costs assuming compute per dollar doubles every four years, with error shading representing no change in compute costs or a doubling time as fast as every two years. The red line represents expected GDP at a growth of 3 percent per year from 2019 levels with error shading representing growth between 2 and 5 percent.

Figure 1.4: AI is the new mining. Data source: CSET, 2022.

2 AI DAO Framework

AI DAO contains three main thrust areas, *decentralized governance for AI infrastructure and operations, finance infrastructure for AI (AIFi), and AI community focusing on human capital for AI.* These three areas are the pillars of AI DAO.

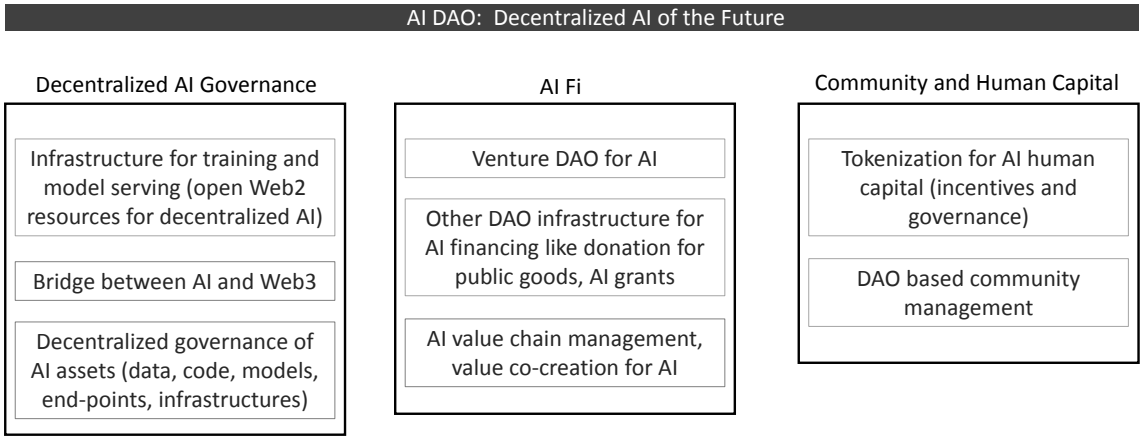


Figure 2.1: Three main components of AI DAO.

2.1 AIFi

The main goal of AI DAO is to make it a gold standard for DAO-based AI. To achieve such a goal, AI DAO will be created as an experimental platform for the community to explore the wide range of finance mechanisms for AI. AI DAO supports the major token formats. It is an open environment for experimenting

tokenomics for AI projects. AI DAO is a venture DAO for AI that includes a set of smart contracts to support flexible funding models for AI. AI DAO structure is as follows.

1. **AI DAOs:** To support flexible funding models for AI, AI DAO implements a hierarchical model, DAO of DAOs. Different AI DAOs can be instantiated to finance AI projects to satisfy the needs of different AI communities. For instance, in consortium-based AI DAO, AI models and end-point services can be jointly owned and managed by a community of members. Donors can contribute resources to the DAO to support AI projects that can increase public goods. For instance, AI projects that monitor and mitigate online hate speech, AI projects promoting social justice and fairness, AI projects enhancing privacy, and preventing abuse of private data (like AI-based detection of misuse of personal pictures posted on social media). We envision multiple DAOs working together to finance AI projects, such as venture DAO, donation DAO, applications or mission-specific DAO.

2. **AI DAO factory contracts:** It can create a new instance of AI DAO. AI DAO supports an environment of purpose-built DAOs. An AI DAO instance could focus on one area of an AI model or application: an NLP model, a model for text-to-image generation, a model for crypto asset management, and a model for face recognition. AI DAO provides templates to support different AI DAO contract deployments. Each AI DAO can implement its own governance mechanism.

3. **Business process templates:** AI DAO will develop smart contract templates and libraries so that a community of AI builders can pick and launch a specific DAO at a low cost based on its needs.

4. **AI DAO tokens:** AI DAO protocol supports tokenomics around the AI models and applications. For instance, to use an AI model, customers need to pay tokens. To be more specific, AI DAO-based face recognition applications can ask customers to pay one token for each face recognized. Revenue-sharing/income-sharing schemes are cemented on-chain by the AI DAO smart contracts. DAO tokens can be acquired after investing or donating to the DAO. The DAO tokens can be used for governance. Owners of the DAO tokens participate in governance with off-chain or on-chain voting. In order to vote, DAO token owners may be required to lock

their tokens. It is essential to point out that an AI DAO may implement multiple tokens and support different token formats.

5. **Treasury:** Each AI DAO instance can have its own treasury, where the funds are locked in the DAO smart contract. The smart contract code and DAO governance manage the spending of the treasury. AI DAO applies both on-chain voting (like Compound) and multi-sig wallet (like Gnosis Safe) for treasury control. A multisig is a wallet that requires approval from multiple people before any transaction occurs.

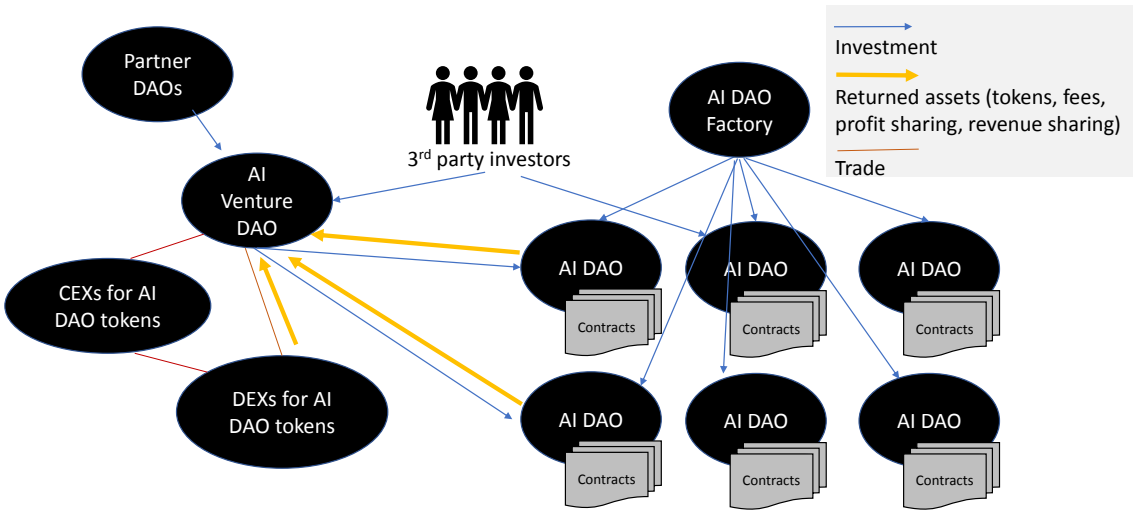


Figure 2.2: Venture DAO for AI and AI Fi.

A benefit of AI DAO protocol is that it codifies the value creation process using smart contracts. Participants of AI DAO, like sponsors, investors, developers, contributors, and operators, are incentivized to work together in activities related to increasing the efficiency of the AI process (better training tools, optimization of computing resources, improved service end-points, enhanced training data quality), maintenance of the model, fine-tuning the model for specific use case scenarios, revenue creation, and governance to accelerate the growth of the model like supporting new applications, expansion of the model, integration of the models created by different AI DAOs.

AI DAO comprises a venture DAO for investing in purpose-built AI DAOs and projects. It is a DAO-based investment vehicle for AI that aims to support a wide range of AI projects with high growth potential or deep impacts

to the Web3 community, like content creation, natural language processing, task automation, DeFi, games, etc. Each purpose-built AI DAO can attract investment or sponsorship by itself. In addition, it may receive co-investment from the leading venture DAO. The main venture DAO implements an online governance mechanism to make investment decisions. AI DAO is bound to transform how the public is involved in the value-creation process of AI. The process is decentralized, open, and community oriented.

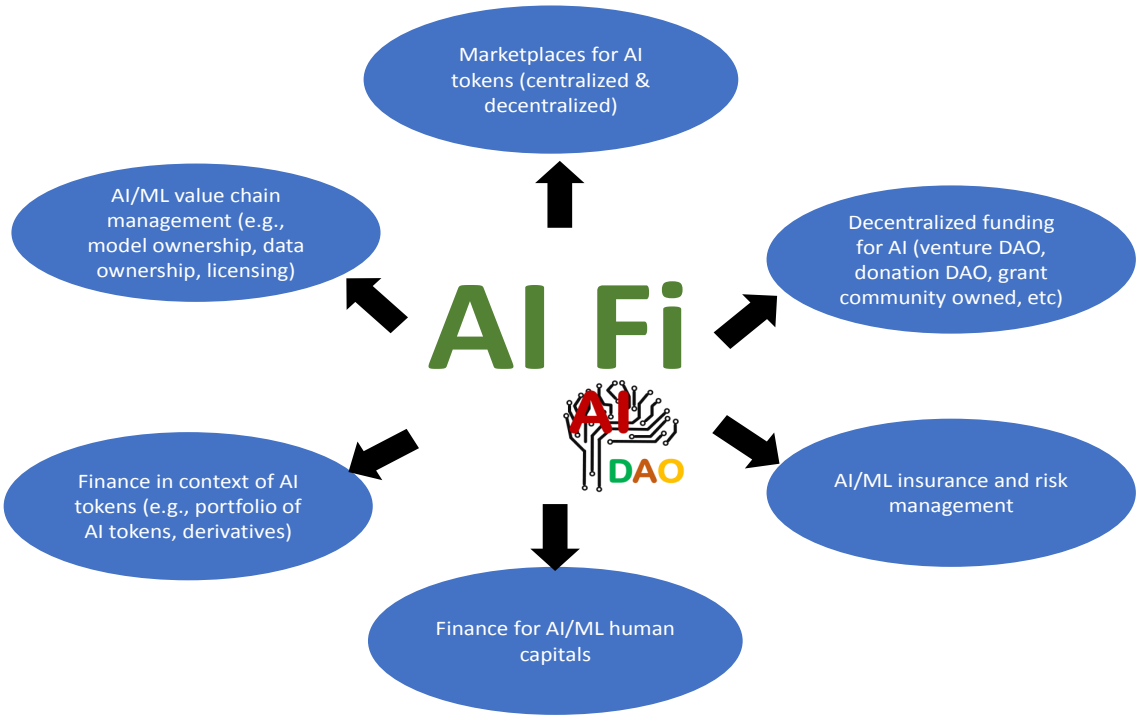


Figure 2.3: Scope of AI Fi.

To summarize, AI DAO is a platform for AIFi. It provides an environment for experimenting with finance innovation and tokenomics to fund and support AI projects. It offers a more agile and transparent DAO-based process for AI finance. One benefit of AI DAO is that it potentially lowers the barrier for small AI teams. A team can use convertible tokens to develop AI technologies and validate new ideas instead of spending resources on the overheads required for forming and managing a traditional company. When the time is ready, equity shares can be issued to the token holders. This way, the AI innovation process based on AI DAO can be agile, lean, and mean.

2.2 Decentralized AI Governance and Ops

AI DAO provides a unique approach to satisfying the computing resource needs of AI. It leverages the existing cloud-based resources like GPU clusters for large model training. It extends the existing concept of MLOps to Web3 by enriching its scope with Web3 and DAO-based elements. In the beginning, AI DAO focuses on bridging the cloud-based resources for decentralized and DAO-based AI projects as well as Web3 projects, a concept that we name it Cloud3. In the long run, AI DAO will develop tools and standards to support decentralized AI ICT infrastructures that encompass both the traditional clouds (integrating AI resources from a network of distributed cloud providers) and community-provided resources like decentralized GPU marketplaces.

MLOps is a set of best practices wrapped around the existing discipline of DevOps [KKH22]. The practices integrate ML/AI development and operations under a unified framework of MLOps. MLOps includes components such as:

- *ML data sources and the datasets (data acquisition).*
- *Repositories of AI models and metadata (like attributes, formats, histories).*
- *Automated ML pipeline and workflow process that manages the datasets and models.*
- *Software AI artifacts like containers running ML training tasks, hosting service end-points.*

Despite its huge success in recent years and high expectation to be a sector of AI reaching 6 billion U.S. dollars in 2028 [1], the existing MLOps scope is confined within the space of Web2. Specifically, the narrow definition of MLOps will soon become obsolete in the era of Web3 in the following aspects:

- **Ownership of AL/ML assets (data, models, and codes)***: Web3 expands the concept of digital ownership to a new level with decentralized, permanent data storage managed by decentralized governance mechanisms like data owned by DAOs.*

[1] The global MLOps market size was estimated at USD 612.40 million in 2021 and is projected to reach USD 6161.20 million by 2028 [Dig].

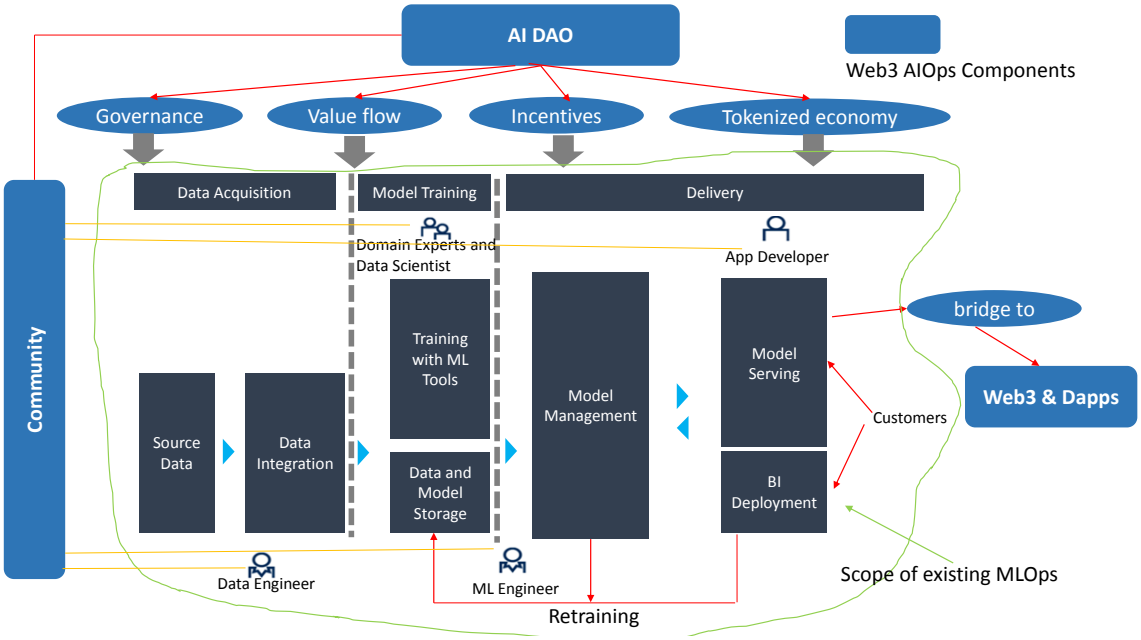


Figure 2.4: Decentralized AI Governance: The components within the green circle (gray boxes) are expected to be worth $6 billion in 2028. AI DAO focuses on the blue components and seamless integration with the gray boxes, which we believe would be valued at more than $6 billion.

- **AI value chains:** *Web3 opens a new world under the concept of creating a global digital world with value. MLOps, as the technology foundation for Web2 AI, does not support managing the flows of values for AI.*

- **Returns to the contributors:** *The global AI research and developer community has collectively made significant contributions to advancing AI like open source code, datasets, ML algorithms, knowledge, and best practices, in particular by academic and industry researchers. Their efforts are less recognized and rewarded under the current Web2 MLOps model, which harms the development of AI as a collective and community-based process.*

The concept of decentralized AI governance under AI DAO is to expand the scope of MLOps in the context of tokenomics and Web3. In particular, AI DAO adds these dimensions below.

- *Use AI DAO governance for managing the life cycles of ML models and end-point services.*
- *Manage and govern AI/ML value chains by smart contracts. AI DAO bridges ML service endpoints to Web3 and facilitates tracking of value flow for AI.*
- *ML workflow process is managed by a hybrid environment with both on-chain and off-chain components, which brings the benefits such as transparency, accountability, and auditability to ML workflow.*
- *Data acquisition and model ownership are governed by AI DAO. Contributions are incentivized to improve the process and the outcome of data acquisition and model training.*

Compared with the existing practice, AI DAO adds new values to Web3 AI in the following aspects:

- *Business process automation using smart contracts and DAOs.*
- *Deep integration of ML workflows like service delivery and data acquisition with tokenomics.*
- *Community-oriented governance of ML artifacts (data, models, codes, service end-points) and ML life-cycle management using DAO-based mechanism.*
- *Integration of ML end-points with Web3 and dApps.*
- *Leverage Cloud3 for ML infrastructure, including data storage, model hosting, and service end-points.*

Essentially, AI DAO defines a new space of AI operations under the context of Web3. For the AI DAO projects, AI DAO provides a foundation to support the needs of computing and operational resources.

2.3 Grow AI DAO Community

AI DAO is a decentralized community where its members are incentivized to collaborate with one another to drive value.

The broad AI community includes *AI investors, AI project sponsors, AI experts and researchers, AI developers, AI service brokers, AI DAO contributors, domain experts, AI educators, training data collectors/contributors, AI operators, and key AI application customers.* According to estimates, there may be as few as 22,000 highly-trained AI specialists worldwide and up to 300,000 AI researchers and practitioners within broader technical teams.

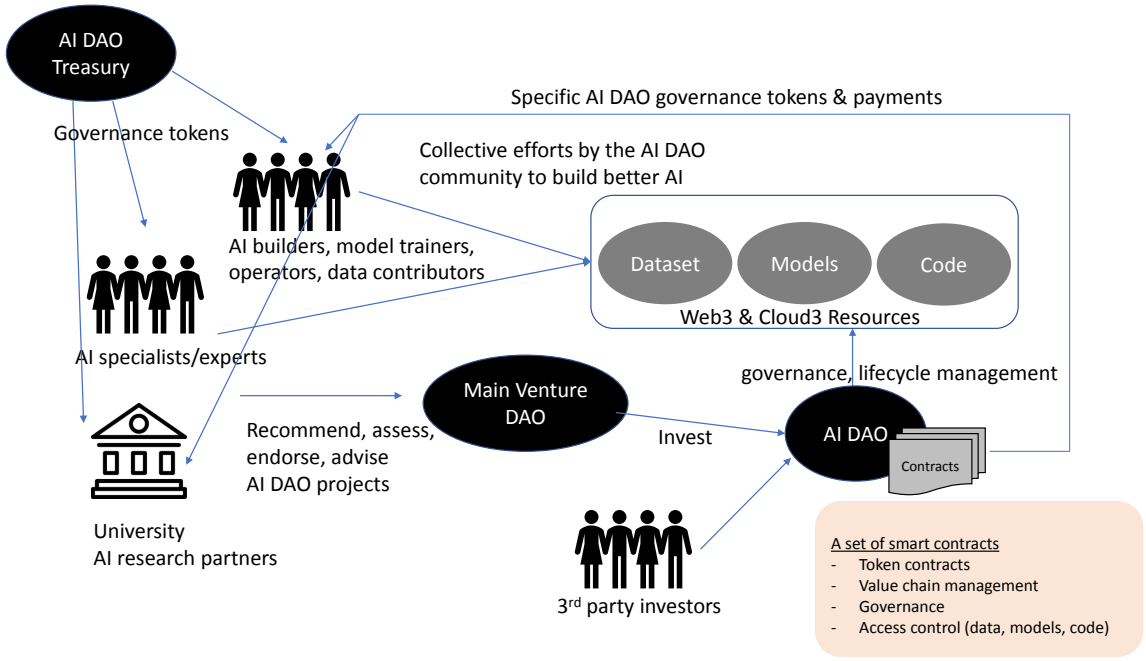


Figure 2.5: Community driven approach for AI with decentralized AI governance and AI Fi.

It is critical to highlight the uniqueness of the AI DAO community. Although the community of AI builders may overlap to a certain degree with the open source developer community or DevOps community, it distinguishes from them because the training, expertise, knowledge, and tasks involved in building AI applications and solutions are different. A successful AI project needs data engineers, model engineers, machine learning DevOps engineers, domain sci-

entists, and experts who can create, enhance, and fine-tune AI algorithms.

The main mission of AI DAO is to attract AI specialists and developers around the globe to create and contribute to innovative AI projects. Another mission is to broaden the participation of AI by engaging with the leading universities in AI worldwide and enlarging the talent pool of AI for AI DAO. There is a disparity between Web3 developers and trained AI specialists at this moment. It is rare to find AI specialists who also understand Web3 or Web3 developers who have in-depth knowledge of AI and ML. AI DAO aims to address this deficiency by partnering with universities worldwide and supporting programs to increase the talent pool of future leaders who can innovate in the intersection between AI and Web3. These include sponsoring education efforts (like creating new courses), creating focused training programs, supporting hackathons and student projects, giving small grants to relevant university projects, organizing workshops, etc.

AI DAO implements its own governance token. The total amount of AI DAO governance tokens is fixed. Individuals become the owners of the AI DAO project by holding the AI DAO governance tokens. AI DAO has its treasury (separate from the venture DAO). The AI DAO treasury receives protocol fees from all the AI DAO instances. The tokens represent the owners' stake in the DAO, like the AI DAO treasury, and their ability to participate in the DAO governance. The token owners can participate in activities such as making proposals and suggestions (like recommending new features to the AI DAO implementation and creating standards), involving in decision-making, and voting.

The token owners share the responsibilities for the growth of AI DAO. They are involved in business operation decisions like voting on incentive plans and marketing strategies. To discourage free riders, an AI DAO contract instance can require the token owners to lock their tokens and participate in governance activities to qualify for certain benefits. The goal of such a mechanism is to incentivize the token owners to contribute and ensure the sustainable growth of the DAO.

A significant amount of the AI DAO governance tokens will be airdropped in three years to the selected contributors, including AI specialists, AI developers, AI DAO project initiators, and community organizers. The AI DAO project team will recruit AI experts and specialists who can recommend, evaluate, and endorse AI projects for the venture DAO. In return, they will be rewarded based on their efforts' quality and outcome, such as investment decisions, token value

growth, the success of the AI projects, etc.

To recognize the contributors who have made substantial efforts to the DAO itself or the AI projects initiated using the AI DAO infrastructure, badges and NFTs can be awarded. AI DAO will also recognize the sponsors and supporters who have helped it achieve its mission and vision.

Note that each specific AI DAO has its own stakeholder community and may issue its own governance tokens. If the main venture DAO invests in a specific AI DAO, it will receive governance tokens and/or other tokens.

Different AI DAO contract instances can choose the voting strategies that they consider best suited for fulfilling the purposes of the DAO. The AI DAO factory is designed to support flexibility in DAO governance (on-chain voting, off-chain voting, or both). To conclude, AI DAO focuses on creating and growing a community of contributors and builders who are well versed in both AI and Web3 to engage in the collective development of AI.

3 Focused AI Areas

This chapter provides a glimpse of the AI fields that BIT AI will focus on in the first two years. The list will be updated as the project evolves. In addition, the priorities may also change according to the needs of the key stakeholders, market trends, and evaluations of the investment outcomes. It is essential to mention that BIT AI is a permissionless open environment. Anybody can create a DAO to fund research, model development, and commercialization of a specific area of AI.

The list reflects the current thinking but is not limited to those mentioned areas, which means that any project related to Web3 AI will be included. The community-based approach is meant to be inclusive, adaptive, and agile.

3.1 AI Driven Content Creation

ML-based content creation is picked as one of the focus areas of BIT AI for many reasons. Firstly, ML-based content creation, like text generation, story generation, image generation, audio generation, code generation, and other generative AI-based use cases, has experienced major break-through in recent years. The field has advanced to a pivotal point for a big bang of a new era, where we will see rapid and explosive growth of ML-powered content creation applications and adoption. Secondly, ML-based content creation has the potential to attract a large number of customers around the globe in a short time period, including paying customers. Thirdly, ML-based content creation is anticipated to have significant economic impacts like productivity improvement. For instance, the global conversational AI market is expected to reach $41.39 billion by 2030 (report by Grand View Research).

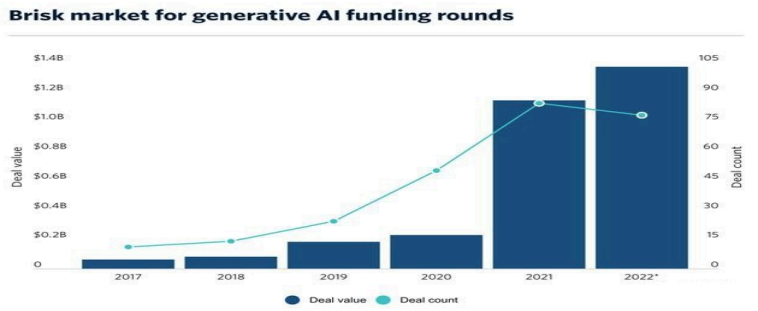


Figure 3.1: Investment trend to AIGC.

To put it into perspective, generative AI is one of the most versatile ML areas in creating values for Web3. It can be applied to areas such as NFTs, Web3 games, Web3 social networking, etc.

3.2 AI for Web3 and dApps

Another high-priority area for BIT AI is AI for Web3 and dApps. These include but are not limited to, AI/ML for supporting decentralized identifiers (DID), community-based identities like soul-bound tokens, AI for Web3 social media applications (partially overlapping with the focus area of generative AI), AI for Web3 security, AI for Web3 E-commerce, Web3 search engine, Web3 based recommendation engine, AI-based risk management for Web3 and dApps. The list is by no means comprehensive.

3.3 AI for DeFi

The global decentralized finance market is expected to reach $125.1 billion by 2028, rising at a market growth of 42.8% CAGR during the forecast period. [1] AI can play a significant role in DeFi, such as risk control, asset management, trade automation, strategy optimization, and fraud detection. For instance, AI can detect pump and dump, model transaction traces, correlate cross-chain transactions, profile investor behaviors, price assets, and model risks. High-quality data is vital to ensuring the successful application of AI and ML to

[1] Yahoo. Global decentralized finance market size. https://www.yahoo.com/now/global-decentralized-finance-market-size-125100396.html

DeFi, and existing data sources are primarily centralized. BIT AI is committed to offering an alternative community-driven approach. Specific DAO can be set up to support, manage, and govern DeFi data collection and use of such data for AI training and modeling to support DeFi applications and use cases. The stakeholder community can contribute AI models, the expertise of MLOps, use case support, tools, etc. The DAO will provide incentives to the contributors.

3.4 AI for Games and NFTs

Another priority area of BIT AI includes games and NFTs. There are many use-case scenarios of AI and ML for games, Metaverse, and NFTs. To provide some examples, AI can be applied for modeling and understanding gamer behaviors that can create benefits to the applications such as pay for play, AI-based NPCs, detecting cheating, analyzing context information in games, enhancing gameplay experiences, and generating content for games like chatbots. There are opportunities for generative AI in both the area of NFTs and games. An interesting and insightful discussion thread by Jonathan Lai (a16z partner on games and Web3) on Web3 games and AI can be found here [2].

3.5 AI Areas with High Growth Potential

In addition to what has been described above, BIT AI is open to any emerging area of AI with high growth potential. The community-driven process can help BIT AI to identify areas worthy of investment. The thesis is that DAOs relying on community wisdom can make better decisions and leverage collective efforts to deliver growth and value.

3.6 AI/ML Tools

Lastly, BIT AI will support efforts to build reusable tools that can benefit the Web3 AI ecosystem. For instance, tools that can improve training speed, optimization tools that can reduce the cost of ML training, productivity tools that can benefit multiple BIT AI or BitDAO-funded projects, and tools for managing data, models, and AI services in a decentralized environment. BIT AI

[2] web3+ = AIGC (write with AI). https://twitter.com/Tocelot/status/1599833843921342464

leverages the existing tools and libraries that have already been developed for Web2 MLOps. The focus will be on the new tools that align with the BIT AI's vision and the key stakeholders' needs.

4 Governance Tokens and AI Venture DAO

4.1 Governance Tokens

AI DAO issues its governance tokens (ERC20) to support a healthy and growing AI DAO ecosystem. The AI DAO tokens are governance tokens (not security tokens). Only a small percentage of the governance tokens may be available for public sales. The rest of them is for the AI DAO stakeholders and contributors.

Because it is not practical to give the governance tokens to every AI DAO stakeholder or individual contributor, a certain number of the governance tokens will be distributed through airdrop to the AI DAO stakeholders and contributors. The governance tokens will also be used as incentives to reward the early adopters and contributors. Key stakeholders may be able to acquire the governance tokens at a discount price.

In addition, strategic investors to the AI venture DAO will receive the governance tokens (negotiated case by case).

The total number of the governance tokens is 1,000M. There is no inflation of the governance token. Distributions of the governance tokens are below.

To participate in the AI DAO governance, the token holders must stake their tokens. A minimal staking period is required for governance. The governance mechanism prefers the devoted token holders who commit to the AI DAO missions. To a great degree, the future of AI DAO depends on sound and healthy governance, for instance, the development of AI DAO standards and decisions to invest in the AI DAO ecosystem resources. Staking is necessary to ensure responsible participation by the committed stakeholders.

The design is for promoting responsible behaviors using AI DAO resources and services. For instance, a model provider may use the AI DAO resources for

Table 4.1: Governance token allocation

	Purposes
39%	Airdrop and rewards to the contributors and stakeholders (distributed over three years)
20%	Execution team and key stakeholders
7%	AI venture DAO investors
16%	AI DAO treasury
6%	Advisors and key contributors
5%	Incentives to the AI DAO management and developer team
7%	Reserved

prohibited activities. In addition, many AI DAO functions may require possession of a minimal amount of governance tokens. Since the governance tokens can be earned via the AI DAO's reward program, possession of the earned tokens can be viewed as the reputation of the stakeholder.

Furthermore, the governance token holders may receive preferred status for selected services and functions. This means that under certain circumstances, they may receive a higher quality of services (QoS) than the regular users who are not active participants in the AI DAO ecosystem and governance activities. For instance, jobs belonging to the AI DAO token owners may receive higher priorities during model training.

AI DAO implements its treasury on-chain. The AI DAO treasury is the single contract for storing the revenues from the AI DAO ecosystem. Possible revenue resources include but are not limited to: transaction fees, management fees from the AI DAOs and projects, fees from the AI DAO decentralized marketplaces, governance token sales, and donations.

The mission of the AI DAO treasury is to support the AI DAO ecosystem, including creating open standards, developing reusable tools and code, adding new features, business development, and seed funding for high-priority projects. Management of the AI DAO treasury is multi-sig based.

4.2 AI Venture DAO

AI DAO comprises a collection of DAOs. The main venture DAO is an instrument that raises capital to invest in other AI DAOs instantiated from the AI DAO factory. In addition, AI DAO includes other DAOs for supporting AI projects, such as donation-based DAO focusing on public goods related to AI and

a grant DAO that issues grants to AI projects.

AI stakeholders (the governance token holders) can recommend, assess and endorse specific AI DAOs to the venture DAO. Investors deposit tokens to the venture DAO. The venture DAO can accept tokens from a list approved by the community. When accepted investment tokens are deposited into the venture DAO, an on-chain receipt will be created. Later (after a certain lock period), the investors can withdraw the earnings (e.g., revenue, profit, income) from the venture DAO based on the receipts.

To reduce complexity, the venture DAO investments are divided into periods, for instance, six months. In each time period (round), the venture DAO will select and invest in several AI DAOs. This means that each round will have its own cap table and balance book.

Depending on the implementation of each specific AI DAO, the main venture DAO receives tokens after investing in an AI DAO. For instance, the main venture DAO may receive ERC20 tokens or convertible tokens issued from an AI DAO. The tokens can be traded later in exchange for other tokens. In addition, if a private company is set up based on the AI DAO, the tokens can be converted to equity shares.

If the tokens are revenue-sharing, the main venture DAO will receive revenues or income by holding these tokens. For example, a content generation-focused AI DAO can charge users based on usage, like paying utility tokens for model-serving API calls. Other revenue potentials include renting datasets and/or models owned by an AI DAO.

Similar to API mesh, different AI DAOs can collaborate where one AI DAO service end-points can call the end-points of other AI DAOs. When making investment decisions, one criteria is whether the project can leverage or create synergy among the AI DAO projects.

Depending on the decisions made by the venture DAO stakeholders, the venture DAO may act as liquidity providers to the DEXs setup for selected AI DAO tokens. The community will select AI DAOs with high growth potentials or significant value to the AI DAO ecosystem and decide whether the venture DAO should provide liquidity for the corresponding AI DAO tokens.

To summarize, the main venture DAO can hold other AI tokens. The valuation of these tokens may increase significantly over time for successful AI projects. In addition, the venture DAO may receive income from token sales, revenue sharing, DEX fees as a liquidity provider, etc.

Table 4.2: AI DAO treasury, the main venture DAO and 3rd party AI DAOs

	AI DAO treasury	**Venture DAO**	**Other 3rd party AI DAOs**
Sources of fund	AI DAO, donation	Venture DAO investors	Investors or donors to each specific DAO
Revenue sources	Protocol fees, management fees, sales of the governance tokens, DEX fees of AI DAO tokens	Revenue sharing from AI models (serving, licensing, etc.), appreciation of AI DAO tokens, liquidity fees, etc.	Revenue sharing from AI models (serving, licensing, etc.), appreciation of AI DAO tokens, liquidity fees, etc.
Governance body	AI DAO token owners	Investors to the venture DAO	Investors or donors to the 3rd party AI DAOs
Investment decision	Voting	Voting	3rd party AI DAO specific
Governance format	Both on-chain and off-chain	Both on-chain and off-chain	On-chain and/or off-chain (AI DAO specific)
Governance token	AI DAO governance token (ERC20)	NFT receipts recording the amount of investment and type of tokens	AI DAO specific

As described earlier, AI DAO comprises a global treasury. The treasury is a smart contract separate from the main venture DAO. A fixed amount of AI DAO governance tokens will be allocated to the treasury. The AI DAO governance token holders manage the treasury. The governance tokens owned by the treasury will be airdropped to the AI DAO community's recognized and distinguished contributors over three years. The community can donate to the AI DAO treasury. In addition, the treasury will receive protocol fees from all the AI DAOs. The resources managed by the AI DAO treasury will be spent on efforts that can improve sustainability and secure the growth of the AI DAO ecosystem.

5 AI DAO Voting

For the voting process, the AI DAO governance token owners vote on the AI DAO-only governance issues. Similarly, governance issues related to the venture DAO are decided by the investors of the venture DAO. To participate in the voting process, one must own minimal AI DAO governance tokens or have invested a minimal amount into the venture DAO.

5.1 AI DAO Governance Voting

- The AI DAO governance tokens will be used to support the AI DAO's off-chain and on-chain governance.
- Off-chain governance is based on Snapshot, and on-chain governance is based on Compound style on-chain governance.
- Due to the cost concern and other practical reasons, only important decisions or changes require on-chain voting, such as critical decisions related to the AI DAO treasury.
- Governance token holders may propose and vote on many things essential to the AI DAO ecosystem.
- Governance token holders can vote on the investment decisions for the treasury and the main venture DAO (weighted and combined with the venture DAO voting outcome).

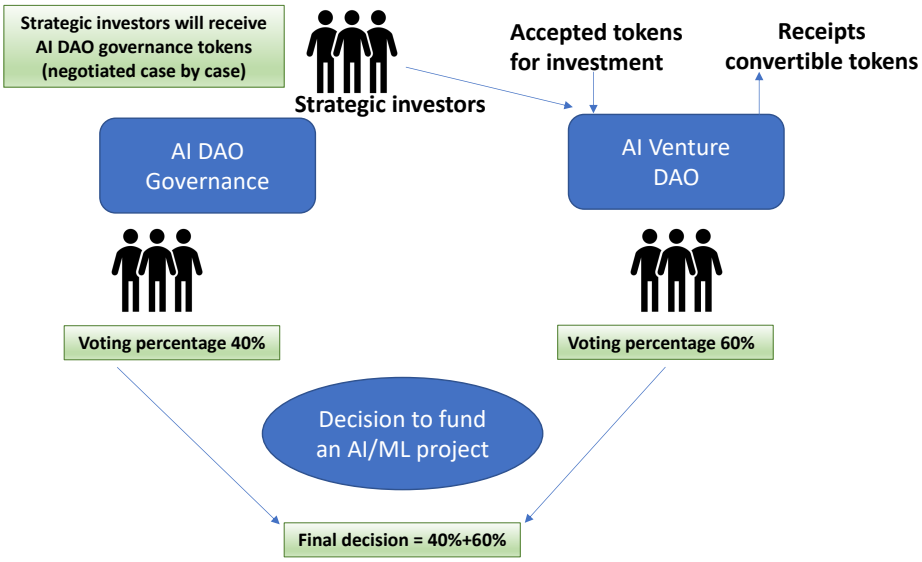


Figure 5.1: The main venture DAO voting process.

5.2 Venture DAO Voting

Investors to the AI venture DAO can participate in the governance (both off-chain and on-chain). When voting is involved, we will consider the following :

- Votes are weighted based on the token value recorded in the receipts.
- The voting mechanism to support specific AI projects is based on a percentage of 60% for the venture DAO and 40% for the governance DAO. Votes from both sides are combined and then weighted to calculate the total amount of votes for the final decision. For instance, assume that there is a total of 100 votes, 60 votes for the venture DAO and 40 votes for the governance DAO. The venture DAO received 40 votes for "Yes" and 20 votes for "No." While on the governance side, it received 30 votes for "Yes" and 10 votes for "No" (for the total 40 votes allocated to the governance side). The final decision will be determined based on a total of 70 votes for "Yes" and 30 for "No," which means that the final decision is "Yes."
- The venture DAO may employ delegates for voting. For instance, the

venture DAO investors may elect or appoint a group of delegates to vote on the investment decisions.

- On the governance token holder side, votes are first calculated based on the governance token amount. Then it is converted before combining with the venture DAO voting results. Using the same example above, if the owners of 50M governance tokens have voted with 40M tokens for "Yes," then the number of votes for "Yes" is 32, and the number for "No" is 8 (a total of 40 votes).

6 Invest in Education and Research

AI DAO is fully committed to education and research to achieve the strategic vision of growing the global community of well-trained builders in AI/ML and Web3.

AI DAO plans to reserve at least 8% of its treasury income for education and research. As described earlier, the revenue sources of AI DAO treasury include the income from governance token sales, protocol fees, management fees, donations, liquidity fees, etc. The 8% funding rate can be revised to be higher in the future according to the decision by the governance token owners.

AI DAO aims to create a network of global higher education institutes as education and research partners. The efforts are led by AI DAO's Academic Committee for Decentralized AI. The committee is in charge of on boarding academic institutions and making overall policies related to academic relationships. After the AI DAO launch, adding schools to the partner list will be based on the joint decisions by the Academic Committee for Decentralized AI and the AI DAO token owners.

Selection of the partner universities follows the guidelines below:

- *Inclusion of leading research universities in AI/ML from five continents* [1].
- *At least one-third of the universities are from the MSCI emerging markets*[2].

[1] Eurasia, North America, South America, Africa, Australia

[2] MSCI. "MSCI Emerging Markets Index (USD)." Accessed Jan. 11, 2023.

The types of activities that AI DAO can support include but are not limited to:

- *Creating new courses related to Web3 AI or courses that combine AI and blockchains/Web3.*
- *Organizing hackathons focusing on the areas of AI DAO interests like hackathons with a focus on the integration of Web3 and AI.*
- *Conducting research in selected topic areas identified by the AI DAO and the key stakeholder community with high priority (similar to other blockchain foundations like Ethereum Foundation with a grant model).*
- *Contributing to the AI DAO projects or projects from the key stakeholders through efforts like class projects, dissertation research, etc.*
- *Expanding the global builder community for AI DAO and the key stakeholders.*
- *Open Source: The project will support the ideation and development of Open Source projects utilizing the AI DAO infrastructure. These will be supported by defined mentorship and open "good first-time bugs" for the community to contribute.*

AI DAO may issue RFP (request for proposals) to the partner academic institutions for specific research and development topics related to Web3 AI. The Academic Committee for Decentralized AI provides stewardship and oversight for the efforts on this front.

In addition, the academic partnership includes engagement and cooperation with student organizations at both the undergraduate and graduate levels. The Academic Committee for Decentralized AI advises a sub-organization responsible for working with student organizations. The student organizations will organize Web3 AI-focused hackathons, Web3 AI-related tutorials, meetup events, and show-and-tell activities.

7 Team

7.1 Team Organization

Behind the AI DAO endeavor is a team of professionals including developers, researchers, AI experts, and other human capital to ensure its success. The AI DAO core team comprises an experienced and qualified workforce in the space of blockchains, AI, and cloud computing.

Figure 7.1 depicts the team's organizational structure. The team's mission is to conduct activities to ensure healthy growth of the AI DAO ecosystem and respond to the needs of the stakeholder community [1].

Some key positions and responsibilities are described below:

- **Advisors:** Advisors are subject matter experts who advise the management team.
- **Community directors:** Community directors are responsible for managing communications with the AI DAO stakeholder community, developing strategies for engaging with the AI DAO community, interacting with the partners, and conducting efforts to ensure the flow of information within the community.
- **Chief portfolio manager:** The role of chief portfolio manager includes: overseeing the financial and economic aspects of the AI projects that

[1] Note that the team responds to and acts based on the interests of the AI DAO and stakeholder communities. The team does not own or have sole control of AI DAO. AI DAO ecosystem will become fully decentralized after the distribution of the governance tokens.

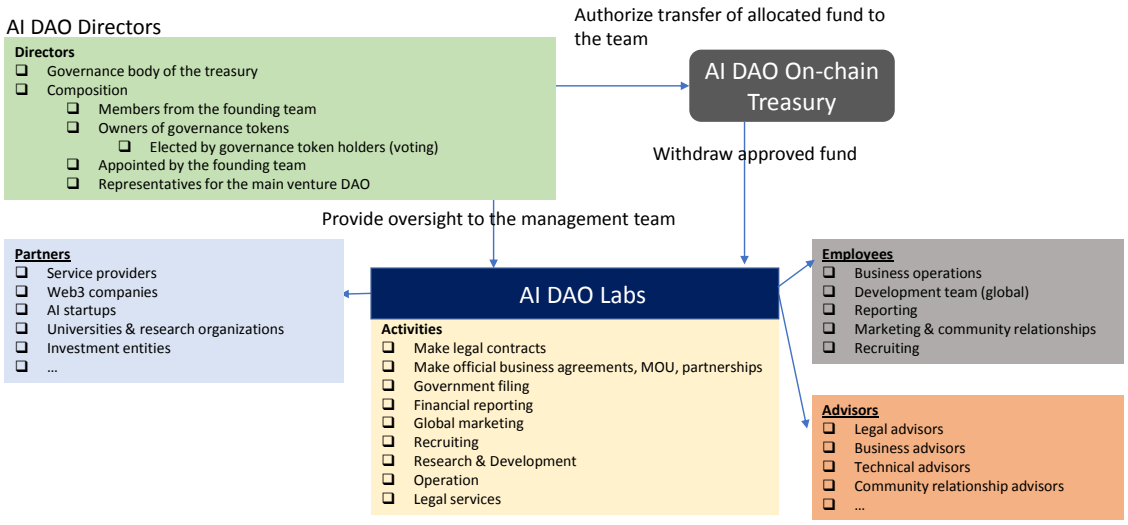


Figure 7.1: Team and activities.

receive the AI DAO resources, developing standards for valuation, analyzing the trend of AI DAO's portfolio of AI projects/startups, creating growth strategies, and reporting to the community of stakeholders.

- **Ambassadors:** Ambassadors' role includes: identifying new business opportunities, facilitating the creation of partnerships, engaging with academic institutions worldwide, and interacting with government entities and NGOs at all levels. Positions of ambassadors are mostly part-time.

- **Marketing director:** The marketing director oversees the team's efforts to promote the AI DAO mission to the public and stakeholders.

- **Chief scientific director:** Scientific director is in charge of developing both short-term and long-term technology objectives for sustainable growth of the AI DAO ecosystem.

Other key positions include chief financial director, director of engineering, and director of the investor relationship.

Note that to receive funding from the treasury by the team, and the AI DAO directors create allocation proposals. The AI DAO governance token owners can vote on the proposals. Upon approval, the directors authorize the transfer of the allocated fund to the team.

7.2 AI DAO Founders

Dr. Larry Shi has worked in the blockchain space since 2016. He received his Ph.D. in Computer Science from Georgia Tech. Before Bitcoin, Larry had been doing research since 2006 in e-cash, such as creating the concept of conditional e-cash. Larry had extensive research & development experiences in the tech industry and founder experiences of a technology startup in cloud services. Larry has many years of experience managing the research and development team. He has led several artificial intelligence, blockchain, and distributed ledger projects at university and industry.

Dr. Omprakash Gnawali Dr. Gnawali (B.S. MIT, Ph.D. University of Southern California) is an expert in the Internet of Things, Distributed Systems, and technologies around Blockchain and Artificial Intelligence. His research has resulted in academic publications, industry standards, and open-source software. He has also served as CTO of startups that created new AI technologies.

The founders provide leadership for the activities described in Figure 7.1. The founders are responsible for ensuring sustainable growth of the AI DAO ecosystem to serve the best interests of the stakeholder communities.

7.3 Partnership

AI DAO's partnership strategy is to engage the broad ecosystem stakeholders like service providers, academic institutions, investment entities, Web3 startups, and community organizers, identify opportunities for joint value creation for the AI DAO stakeholder communities, and cement strategic relationships.

Efforts related to the academic partnership are guided by the principles described in Chapter 5 by the Academic Committee for Decentralized AI. The initial committee comprises some key advisors:

- Dr. Bhaskar Krishnamachari (Ph.D. Cornell, Professor at the University of Southern California, USA).
- Dr. Junsong Yuan (B.S. HUST gifted young program, Ph.D. NorthWestern, IEEE Fellow, Professor at the State University of New York Buffalo, USA).
- Dr. Tianwei Zhang (B.S. Peking University, Ph.D. Princeton, faculty at Nanyang Technological University, Singapore).

- Dr. Aditya Grover (Ph.D. Stanford, faculty at the University of California at Los Angeles, USA).

In the beginning, activities related to student organizations will be managed by Rabimba Karanjai. Mr. Karanjai had/has experience leading computer science student organizations and managing relations between the student clubs at multiple universities with Google's Developer program (GDSC). He has supported these activities as a Google Developer Expert (GDE), Google Developers Group (GDG) organizer, Google North America Startup mentor, and MIT Solutions Challenge judge.

Regarding community building and engagement, Dr. Lan Ni (Professor of Public Relations and Communications) is helping the team to develop AI DAO's communication and community strategies. The Public Relations Society of America Excalibur Awards recognized Dr. Ni's work. She serves on the Research Advisory Committee of the International Association of Business Communicators (IABC) Research Foundation.

In addition, other members from the AI DAO advisor team may contribute guidance to the team regarding partnerships with broad stakeholders like investment entities, 3rd party DAOs, for instance, Ross Uchimura (Web3 and technology angel investor), Xiaotong Sun (DAO governance specialist, Research Lead at DAO^2 and Volue, Ph.D. in Finance expected 2023, University of Glasgow, UK).

8 Questions and Answers

1. **How AI DAO differs from Web2 AI?**

   Web2 AI, such as Huggingface and stability.AI, does not provide any solution to what AI DAO focuses on, including AI Fi, decentralized AI governance, and decentralized AI community management using DAO and tokens.

2. **How AI DAO differs from cloud-based AI?**

   Cloud-based AI like Amazon SageMaker focuses on MLOps. We have already described how AI DAO differs from the traditional concept of MLOps. AI DAO targets decentralized innovations in AI/ML value chain, AI Fi, decentralized AI governance, etc. These are business operations on top of what cloud AI offers. Cloud providers may get into the lucrative space of Web3 like Google already does. It is unlikely that cloud providers will be direct competitors to AI DAO. For example, although significant Ethereum validators are hosted in Google cloud, it is unlikely that Google will be a competitor to layer one blockchain. AI DAO and cloud likely cooperate by working at different layers where the cloud focuses on low-cost infrastructure for AI training and serving. AI DAO's value proposition is at AI Fi, decentralized management of AI value chains, decentralized AI governance, and multi-cloud management.

3. **How AI DAO different from existing decentralized AI efforts?**

   Besides differences like AI DAO's all-community approach, AI DAO focuses on AI Fi, decentralized AI governance based on DAOs, and decentralized community management. These services can be centralized or decentralized. AI DAO supports both cases. In AI DAO, the training of

ML models and serving of ML models are not necessarily decentralized, which is a critical point in how AI DAO differs from all the existing decentralized AI projects (mostly focus on distributed model training and serving like adoption of federated ML, crowd-sourcing program, or privacy based ML algorithms).

4. **How will the universities receive the fund from AI DAO?** A legal entity will be designated to interact with universities on behalf of AI DAO, including activities like contracting and payment transfers.

5. **How much the universities receive the fund, and who will be responsible for this fund?** AI DAO plans to reserve at least 8% from the treasury income for education and research. The 8% funding rate can be revised to be higher in the future according to the decision by the governance token owners.

6. **Will more advisors be added to the Academic Committee for Decentralized AI?** Yes. We are doing it right now.

7. **What are required as technical advisors?** Technical advisors are academic or industry researchers with a strong background in AI/ML. They should be able to help AI DAO forge a partnership with research/education institutions and provide expert opinions on technology soundness and growth potential on AI/ML projects.

8. **How will the token rewards be calculated for the contributors and stakeholders?** It will be calculated by a formula that will be disclosed later.

9. **Will there be a public sales of the governance tokens?**It is not decided yet. If it is decided to have a public sales of the governance token, it wont occur in the first year of AI DAO launch.

10. **How is the AI community different from the open source community?** Although these two communities are not completely disjoint, the AI community includes contributors like model builders, model trainers, data collectors, domain experts, ethics and risk specialists, etc.

11. **What is Cloud3?** Cloud3 is a framework to open Cloud-based infrastructures to Web3 and dApps, and integrate the traditional cloud stack with a new control plane based on tokenomics.

12. **Is there technical documentation for AI DAO?** Yes. The team will release detailed technical papers in the coming months. There is an overview paper from technology side provided on the website of aidao.finance.

13. **Will everything described in the technical paper be implemented before launch?** The decentralized governance of AI paper covers our vision, which will be implemented over time as the project proceeds.

14. **Is AI DAO a collection of EVM contracts?** AI DAO includes: EVM contracts, off-chain software, front-end application. It is more than contract code.

9 Disclaimer

This white paper is for general information purposes only. It does not constitute investment advice or a recommendation or solicitation to buy or sell any investment. The white paper should not be used in the evaluation of the merits of making any investment decision. It should not be relied upon for accounting, legal or tax advice or investment recommendations. This white paper reflects only the current opinions of the authors. The white paper is not made on behalf of any entity or organization that the authors have ties, connections or are members of. The opinions reflected herein are subject to change without being updated.

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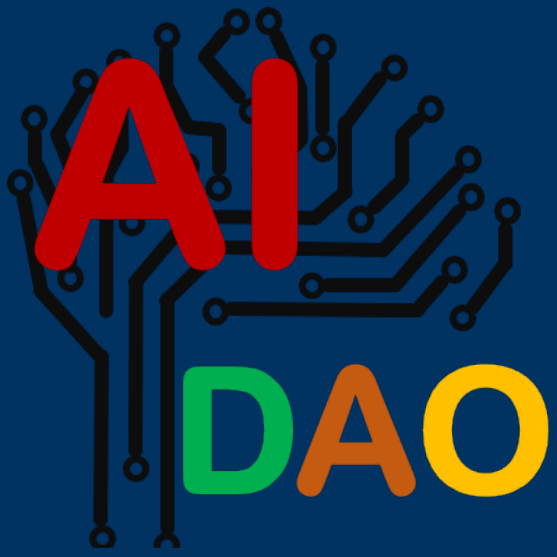

The DAO Way of AI