PHOTREK

Deep Funding Token Report
Insights & Recommendations
R3-IDT-3

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Executive Summary

Photrek, in collaboration with the NFT Guild, proposed the creation of the DeepFunding (DF) Contribution Token Requirements proposal. This initiative aims to further support and evolve the Deep Funding and SingularityNET ecosystems by integrating a token that encapsulates the social dimensions of governance. The DF Contribution Token is envisioned as a comprehensive solution, reflecting community engagement scores on-chain and expanding utility within and beyond the Deep Funding framework.

The primary objective is to transcend the limitations of the current AGIX-centric governance model by integrating a token that represents the multifaceted nature of community contributions. This involves:

- Developing an on-chain representation of community engagement metrics.
- Fostering a more fair and transparent governance process.
- Hosting collaborative workshops to ensure community-driven innovation and inclusivity.
- Delivering a detailed recommendation document for the DF token, forming the foundation for subsequent project phases.

This final report and recommendation compiles the insights and suggestions collected from the series of four workshops, which brought together both experts and community members.

Introduction (Background & Context)

The governance framework of Deep Funding currently hinges on the sole use of AGIX tokens as the only token to be utilized. Although pivotal in the funding process, AGIX's scope is limited when it comes to encapsulating on-chain the comprehensive requirements essential for a truly decentralized governance system. This presents a significant hurdle in evolving a dynamic, multifaceted governance model. A critical aspect that needs addressing is the distinction between financial value, represented by AGIX holdings, and social value, derived from community engagement, participation, and contributions. Establishing this distinction is crucial for fostering a well-rounded and balanced governance ecosystem.

Deep Funding's voting system employs a distinctive mechanism, integrating a user's engagement score with the square root of their AGIX balance. Photrek has successfully developed a proof of concept and is on the trajectory to craft a minimum viable product aimed at automating the computation of these engagement scores. Nevertheless, a

persistent challenge is the on-chain transparent reflection and representation of these engagements. This gap restricts the potential of such applications, limiting their impact within Deep Funding and the broader SNET and Cardano ecosystems. This proposal was aimed at addressing these pivotal challenges and enhancing the ecosystem's governance model.

Milestone Objectives

Milestone: Project Management & Workshop Execution

- Duration: 2 months
- Total Budget: 5000 USD in AGIX

Sub-tasks:

Kick-off & Setup:

- Conduct initial team and community meetings.
- Setup project management tools and procedures.
- Deliverable: Fully operational Project Team and Management.
- Budget: 1000 USD in AGIX

Community Workshops:

- Organize and conduct 2 open community workshops.
- Deliverable: 2 completed Community Workshops.
- Budget: 2000 USD in AGIX

Team & Expert Discussions:

- Organize and conduct up to 2 team meetings with experts.
- Deliverable: meeting notes.
- Budget: 1000 USD in AGIX

Report and Proposal:

- Prepare a proposal for a DF Token based on insights from the workshops.
- Deliverable: Completed and presented DFR4 - DF Token RFP recommendation.
- Budget: 1000 USD in AGIX

Throughout the 2 months, the principles of Sociocracy will be upheld during team and community meetings. These principles include equitable round discussions and consent-based decision-making. The budgeting for each sub-task will ensure the appropriate allocation of funds and resources to achieve the intended outcomes.

Milestone Accomplishments

Kick-off & Setup:

- Successfully conducted initial team and community meetings, setting a collaborative tone for the project.
- Established and implemented project management tools and procedures, ensuring a streamlined and efficient workflow.
- **Deliverable achieved:** A fully operational Project Team and Management, laying a robust foundation for the initiative.
- DF Token Working Doc

Community Workshops:

- Organized and executed two open community workshops, fostering an inclusive platform for community engagement and input.
- Encouraged active participation and dialogue, ensuring that the community's voice was integral to the project's development.
- **Deliverable achieved:** Successfully completed two Community Workshops, rich with insights and community perspectives.
- Open Community Workshops

Team & Expert Discussions:

- Convened up to two insightful team meetings with domain experts, integrating expert perspectives into the project.
- Facilitated in-depth discussions and analysis, ensuring that the initiative was grounded in expert knowledge and industry best practices.
- **Deliverable achieved:** Comprehensive meeting notes and recordings, encapsulating the essence and actionable insights from the expert discussions.
- Expert Workshops

Report and Proposal:

- Meticulously prepared a proposal for the DF Token, synthesizing the insights gathered from the workshops and discussions.
- Crafted a detailed and well-structured DFR4 - DF Token RFP recommendation, ready for presentation and subsequent implementation phases.
- Deliverable achieved: A completed and presented proposal, marking a significant step towards the realization of the DeepFunding Token.

Workshop Summaries and Key Insights

Community Workshop 1: Fundamental Concepts and Community Input

Community Workshop 1, NOV 24 2023

Key Insights:

Fungible Tokens vs. NFTs:

- Participants debated the merits and limitations of using fungible tokens (FTs) versus non-fungible tokens (NFTs) to represent contributions. The discussion highlighted the need for accurate tracking and record-keeping, especially where contributions span multiple funding rounds.

Incorporating Historical Contribution Data:

- The workshop addressed whether historical contribution data should be integrated or if all members should start afresh. The conversation centered around fairness, technical feasibility, and the method of quantifying past contributions in the new system.

On-chain vs. Off-chain Data Management:

- There was a clear emphasis on finding the right balance between on-chain and off-chain data. The group discussed how off-chain data could be stored on platforms like Midnight, accessible to multiple chains, while on-chain data could represent processed information like scores. Privacy and transparency were underscored as critical considerations.

The Role of Oracles:

- The potential role of oracles in the Contribution Token system was a topic of interest. Discussions revolved around how oracles could effectively coordinate data streams and processes between OFF and ON Chain data.

Use of Cardano and Multi-chain Considerations:

- The choice of Cardano as the blockchain infrastructure and the possibility of a multi-chain system were strategically scrutinized. This involved evaluating Cardano's capabilities and the benefits of adopting a multi-chain approach.

Roles and Privileges Management:

- Suggestions were made regarding the management of roles and privileges, potentially on-chain or through a self-sovereign identity (SSI) system. Discussions also touched on the need for an escrow system for NFT transfers to ensure proper governance.

Intended Use Cases of Scores:

- The workshop highlighted the necessity to clearly define the use cases for contribution scores, guiding the system's design. This includes how scores are calculated, used in voting or decision-making processes, and the potential for token expiration or burning, particularly in the context of conviction voting.

Hybrid Token Distribution System:

- The concept of a hybrid system for token distribution was discussed. This approach could allow tokens to be distributed at intervals and also self-minted by participants, offering flexibility in recognizing and incentivizing contributions.

Privacy vs. Transparency:

- The workshop balanced the need for individual privacy with the requirement for transparency in score derivation. Proposed solutions included anonymizing data while still allowing individuals to comprehend how their scores are formulated.

Expert Workshop 1: Technical Feasibility and Preliminary Ideas

Expert Workshop 1, NOV 20 2023

Key Insights:

Exploration of Cardano Improvement Proposals (CIPs):

- The workshop underscored the importance of considering several CIPs relevant to the project's goals, including CIP68 (Datum Metadata Standard), CIP88 (TBD - In Progress), CIP86 (NFT Metadata Update Oracles), and CIP30 (Cardano dApp-Wallet Web Bridge).

Token Implementation and Viability:

- The feasibility of implementing identity tokens (held in user wallets) plus smart contract tokens (with updatable metadata) was discussed, specifically in the context of the DeepFunding use case.
- The preference for fungible tokens over non-fungible tokens was voiced, albeit recognizing the need for further discussion and consideration.

Community Engagement and Contribution Tracking:

- The workshop highlighted the approach of minting identity tokens linked to wallet addresses for every community member, with on-chain metadata reflecting their contributions across different platforms.

- The potential for community members to mint multiple tokens was acknowledged, with the understanding that accruing reputation/contribution across multiple wallet addresses would be more complex and less beneficial.

Development and Standardization Strategy:

- A phased approach to development was recommended, starting small with existing data, exploring how on-chain representation would look, and potentially developing standards for future integrations.
- Options for covering minting fees were discussed, whether by contributors themselves each time they mint a token or by DeepFunding handling the minting and distribution at regular intervals.

Role Dynamics and System Evolution:

- The workshop envisioned roles mainly consisting of contributors and verifiers, with the possibility of future developments enabling automatic transitions between these roles. The need for a flexible system design that can adapt over time as new roles emerge was emphasized.
- The primary purpose of the contribution system was established as translating off-chain data into on-chain data, where the on-chain dataset becomes the definitive source for defining any reputation parameters.

Community Workshop 2: Philosophies and AI Integration

Community Workshop 2, NOV 30 2023

Key Insights:

Philosophy Behind the Token & Contribution System:

- The workshop explored the core intent behind the contribution token within DeepFunding. The primary goal identified was to establish a direct pathway from contributions to voting power, ensuring that highly engaged contributors have their efforts adequately reflected in their influence within DeepFunding. The concept of evolving additional utilities as the system matures was also discussed.

Identification of Bad Actors and Talents:

- The use of AI in the token and contribution system was a focal point, especially concerning the identification of "bad actors" and talented contributors within the community. The group discussed leveraging

knowledge graphs and AI to analyze data sets and behavioral patterns, aiming to recognize and reward valuable contributions efficiently.

Incentivizing Social Networks vs. Individuals:

- A philosophical shift was suggested, focusing on incentivizing social networks rather than individual contributors. The idea is to empower not just the contributions from individuals but also the collective efforts of individuals within their respective environments.

Utilizing Transaction Data for Community Insights:

- The potential of using transaction data to create highlights or dashboards showcasing community activities was discussed. This approach aims at not only empowering contributors but also providing education and visibility into the ecosystem's dynamics.

Role of Learning and AI in Contribution Analysis:

- The integration of Learning Management Systems like Andamio and the role of sentiment analysis in evaluating contributions were considered. The workshop cited the work of AIgents.com by Anton Kolonin as a reference for how AI can be utilized in understanding and leveraging contribution data effectively.

Expert Workshop 2: Legal and Regulatory Considerations

Expert Workshop 2, DEC 8 2023

Key Insights:

Regulatory Considerations and Mitigation Strategies:

- The discussions underscored the potential legal complexities involved in establishing governance frameworks and token issuance. The Marshall Islands were highlighted as a potential regulatory-friendly jurisdiction for setting up an incorporated DAO.
- Early engagement in discussions about regulatory solutions was deemed crucial, particularly in parallel with ongoing governance developments within the SingularityNET ecosystem.

Stakeholder Engagement and System Utilities:

- The importance of identifying stakeholders necessary for successful implementation was emphasized.
- The workshop also explored the future utilities of the Contribution System, including the balance between distributed tokens versus self-minting.

Privacy, Data Ownership, and DAO Ideation:

- Privacy concerns were a focal point, particularly the "right to be forgotten" and the risks of having contributions recorded on a blockchain. Strategies to ensure privacy and avoid identity linkage, such as using zero-knowledge proofs and NFTs for user identification, were discussed.
- The workshop deliberated on data ownership and the need for a legal entity for governance. The possibility of creating a DAO specifically for the reputation system was suggested.
- The importance of having a standardized way to track contributions was noted, with discussions on how this could align with web2 platforms while ensuring data privacy and control.

DAO for Knowledge Graph Governance:

- The idea of establishing a DAO to govern the knowledge graph, incorporating all data and contributions from various sources, was discussed. This DAO would manage access, scoring algorithms, and on-chain data representation under specific membership rules and terms.

Technical Architecture and Integration:

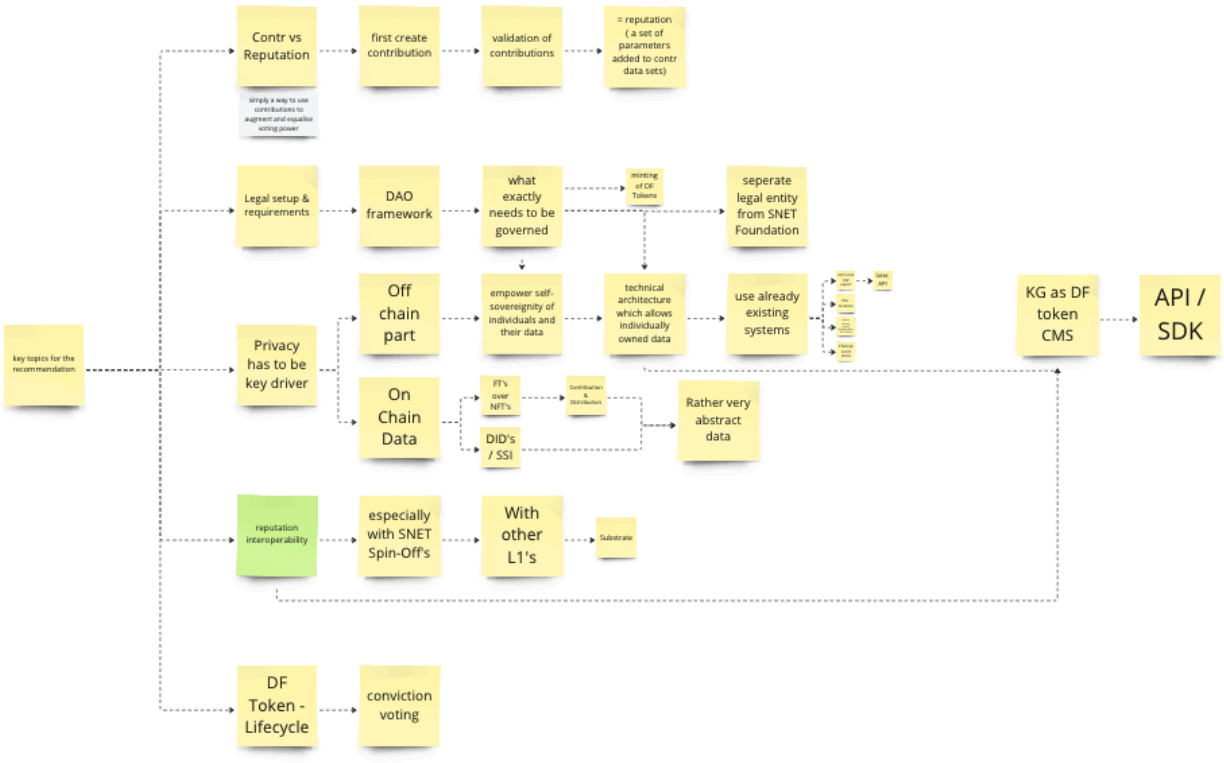
- The need for a robust technical architecture that allows for individually owned data was highlighted. Discussions revolved around the use of existing systems versus developing new ones, with a preference for leveraging existing infrastructure when possible.

Conclusion & Key Lessons Learned

In the development of the DeepFunding Token, a nuanced approach to balancing fungible tokens (FTs), non-fungible tokens(NFTs) and Decentralized Identity solutions (DIDs) is essential, considering each has distinct advantages for transaction versatility and contribution representation. The integration of historical contribution data demands a meticulous strategy that respects past engagements while ensuring fairness and inclusivity. A sophisticated balance between on-chain and off-chain data management is critical, leveraging the transparency and immutability of on-chain data for processed information, and the expansive, privacy-centric capacity of off-chain storage. Addressing the interplay between privacy, transparency, and data ownership is paramount, necessitating robust data governance policies and technologies that empower individuals with control over their data while maintaining system integrity.

Incorporating AI and knowledge graphs can significantly enrich data analysis and structure, offering insights and efficiency in tracking and assessing contributions. However, this technological integration requires careful alignment with the system's overarching goals and ethical standards. Moreover, navigating the complex terrain of legal and regulatory challenges is indispensable for the system's legitimacy and sustainability. Proactive engagement with legal frameworks, thoughtful consideration of jurisdictional nuances, and an exploration of innovative legal structures like DAOs are critical steps in ensuring compliance and fostering a resilient, community-aligned token. These key insights collectively underscore the intricate, multi-dimensional nature of designing a token that is not only technologically robust and legally sound but also deeply respectful of community engagement and individual contributions.

Recommendations for DF Contribution Token Development



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Technical Implementation and Token Design

- Develop a token infrastructure that primarily leverages the adaptability of fungible tokens (FTs) for transactions due to their flexibility and ease of distribution, as recommended in community workshop discussions. Incorporate the use of Decentralized Identifiers (DIDs) or Self-Sovereign Identity (SSI) mechanisms to ensure distinct and self-owned recognition of contributions. Implement solutions like zero-knowledge proofs and utilize NFTs for user identification without directly linking identity.
- Introduce a multi-token approach to acknowledge the diverse range of engagements in the DeepFunding ecosystem. This approach enables a more nuanced solution, allowing for the granular recognition of individual contributions across various domains and groups, enhancing the system's inclusivity and depth.
- Implement a dual-layer data management system, where on-chain data is utilized for transparent and abstract representation of contribution scores, ensuring data integrity and consistency. Complement this with robust off-chain data infrastructure, prioritizing technical solutions that empower individuals with ownership of their data. Integrate and build upon existing systems like Andamio, SWARM treasury, and the DeepFunding CES tool, which already capture community engagement and contributions, thereby harnessing established platforms and enhancing system efficiency.
- In the token design, include mechanisms for seamlessly integrating historical contributions. This integration ensures a balanced acknowledgment of both past engagements and new contributions, fostering a sense of continuity and fairness within the DeepFunding community.
- The need to start small with existing data, discover how on-chain representation will look, and possibly develop standards for other solutions/integrations.
- The suggestion that minting fees could be covered by contributors themselves or handled by DeepFunding at regular intervals.
- Recognition that the roles within this system will evolve, requiring the system to be non-static and adaptable to accommodate future developments, including automatic transitions from contributors to verifiers and the introduction of specialized roles like experts.

Governance and Legal Framework

- Early Engagement in Regulatory Discussions:
    - Engage in discussions about regulatory solutions at an early stage.

    - Parallel discussions should be aligned with ongoing governance developments within the SingularityNET ecosystem.
- Proactive Approach towards Legal Setup:
    - Prioritize the establishment of a robust legal framework for token issuance and governance.
    - Consider setting up an incorporated DAO, potentially in a regulatory-friendly jurisdiction like the Marshall Islands, as suggested by Storm Partners.
- Privacy and Data Ownership:
    - Address privacy concerns by ensuring the right to be forgotten, allowing end-users to delete their data.
    - Establish clear terms and conditions for data usage and ownership, potentially under a legal entity governed as a DAO.
- DAO and Knowledge Graph Governance:
    - Consider setting up a DAO specifically for the reputation system, which might be separate from the SingularityNET Foundation.
    - Govern the knowledge graph incorporating all data and contributions from various sources, managed by the DAO under specific membership rules and terms.
    - Ensure the DAO does not hinder any active initiatives within the SingularityNET and DeepFunding ecosystems.

Data Privacy and Security Measures

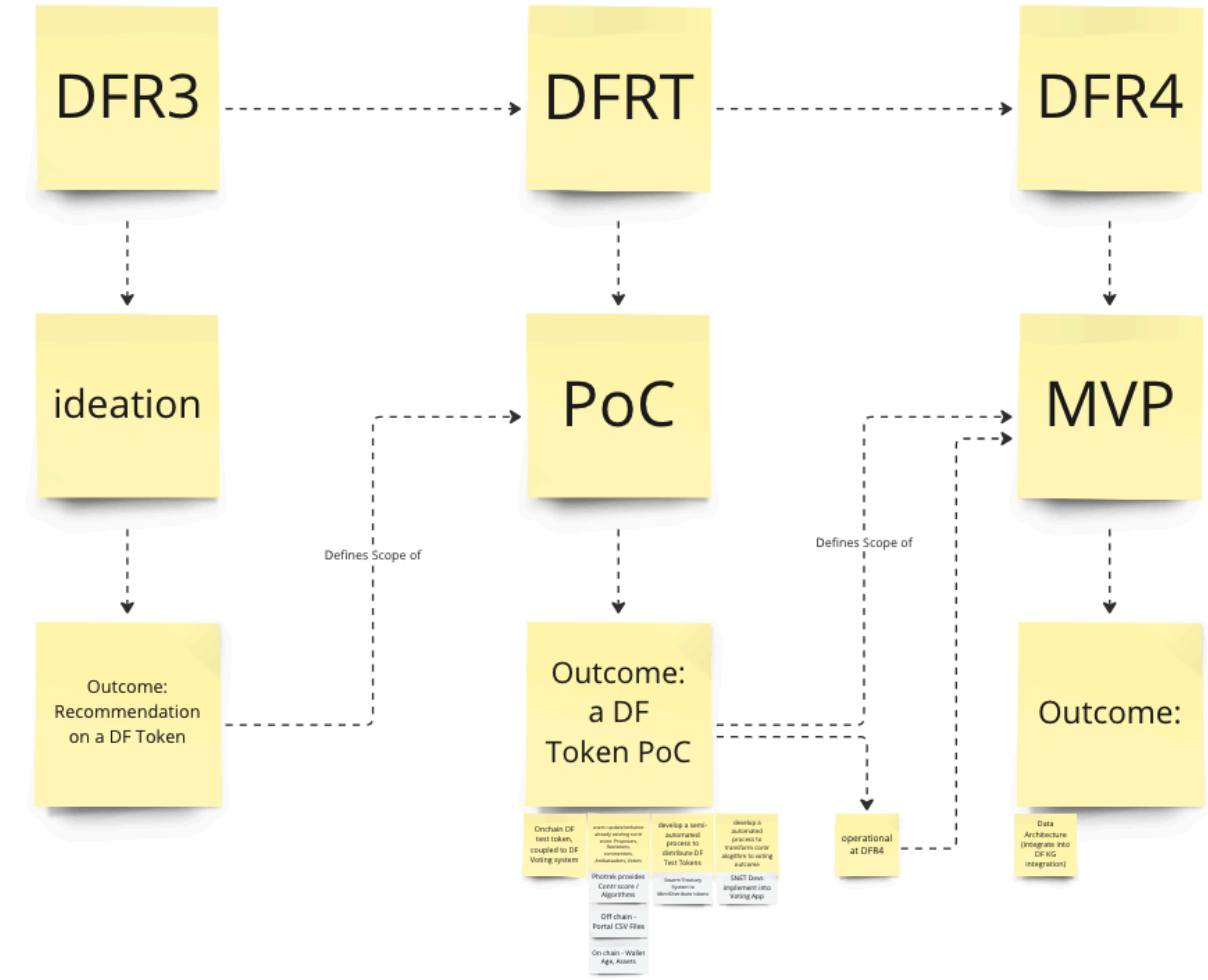
- Decentralized Data Ownership:
    - Empower contributors to own and control their data. Contributors should have the capability to decide which data should be publicly accessible and have the ability to delete their data if desired. This approach mitigates risks associated with centralized data control and aligns with the principles of self-sovereignty.
- Off-Chain vs. On-Chain Data Management:
    - Maintain a delicate balance between on-chain and off-chain data. Sensitive data should be stored off-chain, while on-chain data should be abstract and processed, like contribution scores. Utilize platforms like Midnight for off-chain data that can interact with multiple chains.
- Use of Zero-Knowledge Proofs and NFTs for Identity Verification:
    - Implement zero-knowledge proofs to verify user identities without revealing the underlying data. NFTs can be used to represent user identities, tying them to a score without directly linking them to a wallet address, thus maintaining user anonymity while ensuring data validity.

- Standardized Contribution Tracking:
    - Standardize the method of tracking contributions akin to platforms in the web2 space. This ensures a transparent and fair system where contributions are accurately recorded, and users have clarity over how their contributions are scored and utilized.
- APIs for Secure Data Interaction:
    - Develop well-designed APIs that ensure secure interaction with the data. APIs allow for controlled access, ensuring that data retrieval and submission are handled securely, minimizing the risk of unauthorized access.
- Mitigate the Risk of 'Right to be Forgotten':
    - Address the 'right to be forgotten' by ensuring that users can request the deletion of their data. This can be governed by the DAO established.

AI Integration and Knowledge Management

- Utilizing AI and Knowledge Graphs to analyze data sets and behavioral patterns to identify valuable contributors, manage contributions, and possibly detect bad actors.
- The potential to empower contributions not only from individuals but also from their networks, thereby incentivizing social networks rather than individuals alone.
- The possibility of using transaction data to create dashboards of activities, highlighting the importance of empowering and educating contributors.

Roadmap for Future Development



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Short-Term Milestones:

- DeepFunding Token Proof of Concept (PoC):
    - Develop a PoC for the DF token, focusing on minting fungible contribution tokens. This phase should leverage the Cardano blockchain's capabilities and assess technical feasibility.
    - Trial a semi-automated process for token distribution, utilizing the SWARM treasury system. This should include a mechanism for calculating and

distributing tokens based on user contributions, roles, and engagement levels.
    - Update and enhance existing contribution scores, ensuring they accurately reflect user engagements. This involves a thorough analysis and integration of contribution data from previous DF rounds, encompassing proposers, reviewers, commenters, ambassadors, and voters.
    - Draft initial terms and conditions for data usage, ownership, and the 'right to be forgotten' in line with privacy laws and best practices.
    - Clearly outline the scope and functionalities for a Minimum Viable Product (MVP). This should include detailed requirements, intended features, and the expected outcomes of the MVP.

Mid-Term Goals and Strategic Objectives:

- Iterative Improvements and Expansion:
    - Transition from the PoC to a fully functional MVP. This should involve refining the token distribution mechanism and ensuring the system is scalable, secure, and user-friendly.
    - Actively collect and integrate feedback from the PoC phase. Identify pain points, bottlenecks, and areas of improvement, and ensure these insights are reflected in the MVP development.
    - Trial out multi-token implementation.

- Governance and Legal Framework:
    - Set up a robust legal framework to govern the token. This includes deciding on the structure of the incorporated DAO, outlining member rights and responsibilities, and ensuring compliance with regulatory requirements.
    - Evaluate the feasibility of establishing the DAO in a crypto-friendly jurisdiction like the Marshall Islands, as recommended by Storm Partners.

- Integration with Established Systems:
    - Establish technical architecture for off-chain data
    - Seamlessly integrate the token system with mature and existing solutions. This involves ensuring compatibility with platforms like Andamio and the DeepFunding voting portal and CES tool.

Long-Term Vision and Sustainability

- DID implementations and zero-knowledge proofs
- Integration of AI and knowledge graphs
- Continuously evolve the governance model
- Establish ongoing maintenance requirements and contingency plans
- Community expansion and integration with wider SNET ecosystem

References

- Proposal:
  https://proposals.deepfunding.ai/graduated/accepted/c2af78f2-b4fa-4e73-9859-8f806006f580
- Dework Space:
  https://app.dework.xyz/deepfunding-communit/project-6/overview
- Google Drive:
  Reputation Token DF3
- Miro Board:
  https://miro.com/app/board/uXjVNNuTebA=/?share_link_id=613848040529
- Test token Specs: DeepFunding Community Contribution Test Token