Journal DAO: A New Framework for Ownership of Author in Web 3.0

Tai Jiang, *Follow, IEEE,*

***Abstract*—Ownership is The most important thing about web 3.0. Using blockchain technology, it is possible to make a paper objectively belong to its author. In the era of centralization, "trust" in an organization is required to complete cooperation, whether it is mutual or intermediary. But decentralized smart contracts allow all collaboration to exist objectively without the need for "trust". Once a paper is published successfully, it is uploaded to the chain using smart contracts. Later, the paper nominally belongs to the author, but actually exists in the database of a website, and once value is created it basically belongs to that website as well. In the framework of decentralized science, the paper no longer exists in the database of a website, but the website goes to map this paper. Each paper creates a decentralized organization that gives a token to the author, the journal, and other interested parties, and once the paper has created value, it is distributed to all holders according to the token.**

***Index Terms*—DAO, smart contract, decentralized autonomous organizations, decentralized funding, decentralized science, DeSci, metaverses, parallel DeSci, parallel intelligence, Web3**

I. Introduction

ACADEMIC publication methods have undergone significant historical transformations, reflecting the evolution of technology, society, and culture.Key trends in the historical evolution of author research publication methods are examined in the flowing.

1) **Manuscript Handwriting:** In ancient times, scholars meticulously handwrote academic papers, often by themselves or with the assistance of scribes. These handwritten manuscripts were highly prized and scarce.
2) **Printing Press Introduction:** The 15th-century Renaissance saw a revolutionary shift with the introduction of the printing press, enabling the mass production and distribution of research, greatly enhancing knowledge accessibility [1].
3) **Academic Journals Emergence:** The late 17th and early 18th centuries marked the rise of academic journals as structured platforms for research dissemination, facilitating the organization and categorization of research findings [2].
4) **Peer Review Inclusion:** The early 20th century brought the prominence of peer review, necessitating expert evaluation of research papers to ensure quality and credibility.
5) **Electronic Journals and Digital Publishing:** The late 20th and early 21st centuries witnessed the transition to electronic journals, providing researchers with online access to publish their papers, significantly increasing research output accessibility and searchability [3].
6) **Open Access Proliferation:** In the 21st century, the open access movement gained momentum, advocating for free public access to research. Open-access journals [4] and repositories became more prevalent, promoting knowledge sharing.
7) **Preprints Introduction:** Various fields began adopting preprint platforms in which researchers could share their findings before undergoing formal peer review, accelerating research results dissemination.
8) **Academic Social Media and Blog Utilization:** Scholars increasingly turned to academic social media platforms and blogs to share their research findings, insights, and discussions, expanding their reach and impact.
9) **Blockchain Technology Integration:** Blockchain technology has recently entered academic publishing, offering a decentralized, transparent, and trustworthy publication method, addressing certain traditional publishing challenges [5] [6].

This timeline sheds light on the dynamic evolution of research publication methods, continually adapting to new technologies and societal trends. The future of academic publishing is expected to witness further transformations, including expanded open access, increased peer review transparency, enhanced international collaboration, and interdisciplinary research integration. These trends are poised to shape the future of research dissemination.

Blockchain is a distributed ledger technology that originally emerged as the foundational technology behind Bitcoin. It employs cryptographic techniques to record data in a series of immutable blocks, forming a chain. The key features of blockchain include decentralization, transparency, security, and immutability, making it a powerful tool applicable to various fields beyond just cryptocurrencies.

Smart contracts are self-executing agreements encoded on a blockchain. They automatically execute, enforce, or verify the terms and conditions of a contract without requiring intermediaries. Smart contracts are code-based and are used for a wide range of applications, from payments to asset management.

DAO(Decentralized Autonomous Organization) is an organizational structure that operates based on blockchain technology, aiming to achieve automated decision-making and operations without the need for traditional central management. Decision-making in DAOs is conducted through votes by token holders, and rules and processes are encoded by smart con-

Identify applicable funding agency here. If none, delete this.
Manuscript received February 15, 2023; revised February 15, 2023.

tracts rather than central governing authorities. This automated approach enhances transparency, reduces trust-related costs, and provides equal opportunities for community participation [7].

Application of DAO in Article and Journal:

- **Transparent Peer Review and Publishing Process:** Blockchain can be used to create a transparent academic publishing platform, ensuring transparency throughout the peer-review and publishing processes. [8] Smart contracts can manage review, publication, and payment procedures, ensuring traceability and fairness.
- **Protection of Intellectual Property:** Blockchain and smart contracts can safeguard authors' intellectual property, ensuring their works are not copied or distributed without permission.
- **Identity Verification and Reputation Building:** Blockchain can be employed to establish scholars' identities and reputations [9]. Smart contracts can automate the validation of scholars' achievements, storing them on the blockchain.
- **Data Sharing and Collaboration:** Blockchain and smart contracts can facilitate data sharing and collaboration among scholars, ensuring data integrity and traceability.
- **Automated Review and Journal Management:** Smart contracts and DAOs can be used to automate review processes and journal management, from reviewer assignments to manuscript evaluations and publication [10].

These application examples highlight the potential value of blockchain, smart contracts, and DAO technology in academic publishing and journal management. They enhance transparency, protect intellectual property, verify identity, automate processes, and encourage collaboration. As these technologies continue to evolve, they hold promise for further innovation and efficiency in academia.

This paper emphasizes the transformative impact of DAOs in establishing an explicit ownership of academic research papers by their authors. DAOs empower authors to retain complete control over their works, ensuring that any value generated from these papers is intrinsically linked to the original creators. Through the implementation of DAO, this paper explores the means by which academic papers can be securely attributed to their authors, facilitating a transparent and impartial relationship between the authors and the intellectual assets they produce.

II. Ownership of Research Data

This chapter delves into the intricate matter of research data ownership. In the realm of academic research, the question of who possesses, controls, and manages research data is of paramount importance, involving researchers, academic institutions, publishers, and various stakeholders within society. This chapter explores how data ownership impacts academic research, knowledge dissemination, and scientific collaboration. We examine the legal and policy landscape surrounding data ownership in different fields and countries, as well as the management, sharing, and protection of research data. We also investigate existing data-sharing models and open-access policies and their potential effects on the academic community and knowledge innovation. By delving into the issue of research data ownership, we gain a deeper understanding of the challenges and opportunities in today's academic environment, offering new perspectives for future research and collaboration.

From a physical perspective, the data of articles is stored in the database of the journal website (Look at Figure II). When regular users access the journal website, they can browse and download articles of interest. The interaction between users and the journal website typically involves the following steps.

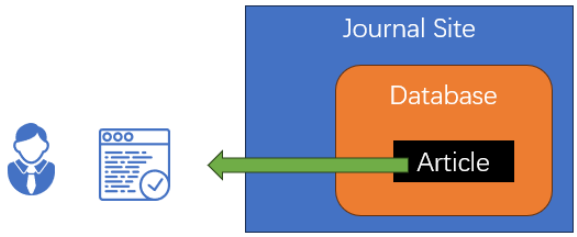

Fig. 1. Article in Database

When an article is uploaded to a blockchain(Look at Figure II), its content, timestamp, and relevant metadata are all recorded on the blockchain. This means that anyone can verify the existence, content, and timestamp of the article. This provides a high level of assurance for the immutability and transparency of documents, particularly with potential significance in research, intellectual property protection, and copyright. Uploading articles to the blockchain also enables decentralized data storage, reducing reliance on centralized institutions. This offers a more open and trustworthy means of data sharing for the academic community and other domains.

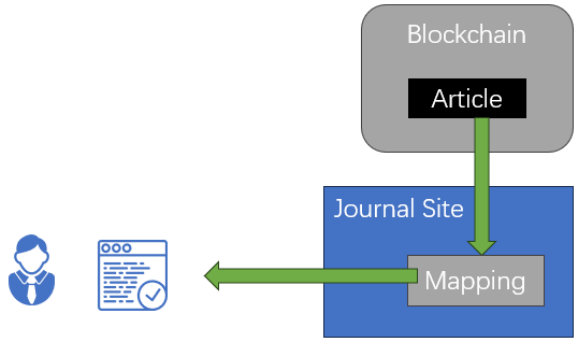

Fig. 2. Article in Blockchain

Uploading an article to a blockchain, as compared to storing it in a traditional database, provides the author with a clear and objective ownership of the article. In a traditional database, the ownership of the data and the integrity of the database are controlled by the entity or organization managing the database. Authors and other stakeholders may not have direct control or visibility into the ownership and usage of the data.

On the other hand, when an article is uploaded to a blockchain, the author can have greater confidence in their

ownership and control over the article. The blockchain's decentralized and immutable nature ensures that the ownership records are transparent, tamper-resistant, and not under the sole control of a centralized authority. This empowers authors to have a direct and verifiable claim to their work, which can be particularly important for intellectual property protection, copyright, and ensuring that the author's rights are respected.

Compared with traditional journals, articles on the chain belong entirely to the author.

a) Traditional Databases: Traditional databases are typically controlled by a central entity or organization, with database administrators responsible for management and access control. This centralization may result in less transparent ownership.

Access to and modification of data in traditional databases often depend on access controls set by database administrators. This can lead to disputes or lack of transparency regarding data access.

Data in traditional databases can be relatively easily modified or deleted. This may raise concerns about data security and integrity, especially in cases where intellectual property protection is crucial.

Ownership and control of data are typically centralized with the database administrator. This centralization introduces a single point of control over data usage, increasing the risk of misuse or improper handling.

b) Blockchain: Every transaction on the blockchain has a clear timestamp, documenting the transfer of ownership. This provides authors with a transparent, immutable record of ownership. Authors can trace ownership back to each stage of the data's lifecycle.

Blockchain utilizes smart contracts to define and enforce data access permissions. This allows dynamic adjustments of data access rights based on different conditions, such as paid access or specific usage licenses.

Blockchain is decentralized, with data stored across multiple nodes in the network. This ensures that no single central entity can unilaterally control ownership, enhancing data security and tamper resistance.

Once data is written to the blockchain, it is nearly impossible to modify or delete. This ensures the immutability of data, providing robust protection for the author's rights.

In summary, blockchain offers a more transparent, immutable, and decentralized ownership mechanism, providing stronger protection for authors' intellectual property and data rights. This is particularly advantageous in scenarios where emphasis is placed on data security, traceability, and transparency.using a blockchain for article storage offers authors a more objective and transparent means of claiming ownership of their work compared to traditional database systems.

III. Author Finance from Journal

In the evolution of electronic journals, websites have become the primary medium for disseminating research papers. Although the content of users' papers remains the intellectual property of the authors, the wealth generated by journals through these papers often belongs predominantly to the journals rather than the authors.

In our hypothetical scenario, we contemplate a shift in this paradigm, envisioning a system where a certain proportion of the generated wealth is allocated back to the authors. Taking paid downloads as a simple example, this mechanism aims to provide authors with a more direct economic incentive. Such a transformation not only has the potential to enhance authors' motivation and creativity but also holds the promise of establishing a more equitable wealth distribution system. This envisioned change could contribute to fostering a sustainable and mutually beneficial development model in the realm of electronic journals, addressing the balance of interests between authors and journals more effectively.

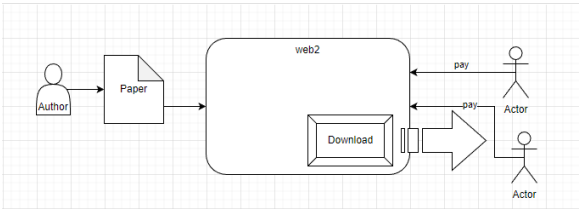

Fig. 3. User Pay for Download in Web2.0

App that enables users to download papers and make money could be designed:

1) **Create a platform:** Design an app that provides a platform for users to access academic papers in their field of interest. The app could be designed for PC or Mobile devices(both iOS and Android devices).
2) **Build a database:** Build a database of academic papers from various disciplines that can be downloaded by users. You could partner with universities, libraries, and publishers to acquire the papers.
3) **Implement a payment system:** Create a payment system that allows users to purchase and download papers. You could charge a fee per paper or offer subscription packages for unlimited access.
4) **Integrate social networking features:** Incorporate social networking features such as discussion forums, chat rooms, and rating systems to encourage users to engage with the content and with each other.
5) **Create an affiliate program:** Allow users to earn money by referring other users to the app. You could provide a commission for each new user referred, or offer rewards for reaching certain milestones.
6) **Implement security measures:** To protect the intellectual property rights of the authors and publishers, implement security measures such as digital rights management (DRM) and watermarking to prevent unauthorized distribution of the papers.
7) **Provide customer support:** Ensure that users have access to customer support in case they encounter any issues or have questions.

Overall, designing an app that enables users to download papers and make money requires careful consideration of legal and ethical issues surrounding academic publishing, as well as the needs and preferences of users. It's important to ensure that the app provides value to both users and content creators, while also operating in a fair and ethical manner.

Web2, also known as the social web, refers to the current state of the internet that we use today, which is primarily focused on social media, e-commerce, and other web-based applications that allow users to interact with each other and with content in various ways. In Web2, payment systems are typically centralized, meaning that they are controlled by a single entity or organization. For example, when we make a purchase on an e-commerce website, we typically use a centralized payment system like PayPal or a credit card. These systems rely on intermediaries to facilitate transactions, which can result in higher transaction fees and longer processing times.

Web3, also known as the decentralized web, represents a shift toward a more open, decentralized, and secure internet that is built on blockchain technology. In Web3, payment systems are decentralized, meaning that they are not controlled by a single entity or organization. Instead, payments are made using cryptocurrency, which is a digital asset that is secured by cryptographic techniques and operates independently of central banks and other financial institutions. Cryptocurrency payments are processed directly between users without the need for intermediaries, which can result in lower transaction fees and faster processing times.

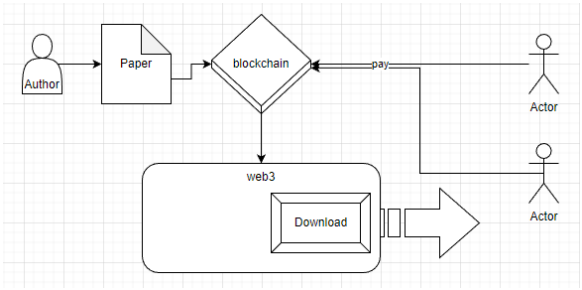

Fig. 4. User Pay for Download in Web3.0

Transforming the app into a DAO framework involves decentralizing control and fostering community involvement. Here's how the app might adapt the design:

1) **Decentralize Platform Governance:**
   Modify Ownership Structure: Shift ownership and governance to a decentralized autonomous organization (DAO). Token holders in the DAO can participate in decision-making.
2) **Decentralize Database Building:**
   Implement Decentralized Storage: Utilize decentralized storage solutions like IPFS (InterPlanetary File System) to store academic papers in a distributed manner.
3) **Implement Decentralized Payment System:**
   Integrate Cryptocurrency Payments: Enable cryptocurrency payments within the DAO for accessing papers. Smart contracts can handle payments, ensuring transparency and security.
4) **Decentralize Social Networking Features:**
   Token-Based Rewards for Engagement: Reward users with tokens for active participation in discussion forums, chat rooms, and ratings. Token-based systems encourage community engagement.
5) **Decentralize Affiliate Program:**
   DAO-Based Referral Rewards: Implement a DAO-based referral program where users earn tokens for bringing in new users. Smart contracts can autonomously manage and distribute rewards.
6) **Implement Security Measures with DAO Consensus:**
   Consensus-Driven Security Policies: Let the DAO decide on security measures through consensus. Token holders may vote on and enforce security policies, ensuring community agreement.
7) **Customer Support through DAO Governance:**
   Community-Driven Support: Establish a community-driven support system where DAO members contribute to resolving issues. This could involve reputation-based systems for trustworthy support.

In a DAO framework, decision-making power and platform control are distributed among the community. The integration of blockchain technology and smart contracts ensures transparency, security, and community-driven governance, aligning with the principles of decentralization.

Overall, the main difference in payment systems between Web2 and Web3 is the degree of centralization. Web2 payment systems are centralized, while Web3 payment systems are decentralized. While Web3 is still in its early stages, it has the potential to revolutionize the way we think about payments, transactions, and financial systems.

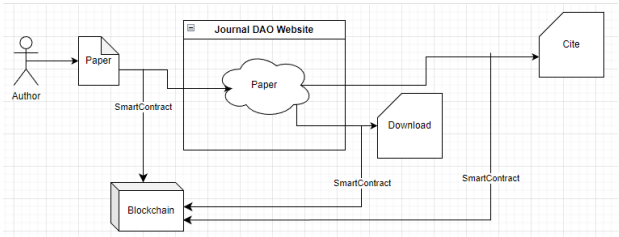

Fig. 5. Journal DAO

In the current era of digitization, the act of anchoring a paper on the blockchain signifies the author's complete ownership of the work, opening up boundless possibilities. The introduction of blockchain technology empowers authors with more rights and limitless potential. Once a paper is inscribed on the immutable blockchain, authors not only possess intellectual property rights but also gain absolute control over their creations. This shift in ownership implies that authors can explore innovation more freely, facilitate transparent data sharing, and attain fairer returns from the wealth generated by their works. The immutability and transparency afforded by blockchain provide robust protection for the rights of paper owners, ushering in new possibilities for academic research and knowledge sharing. This profound ownership transformation elevates a paper beyond being merely a conduit for academic dissemination; it becomes a symbol of the unique wealth created by the author, sparking a profound revolution in the relationship between academia and authors.

IV. DAO TO DESCI

The DAO was essentially a smart contract on the Ethereum blockchain that contained a set of rules for how the organization would operate. Members could buy tokens that would give them voting rights to make decisions about which projects to invest in. Once a project was selected, the funds were automatically sent to the project's creators, and the project would be added to the DAO's portfolio.

In the framework of a DAO, the proposal and voting mechanisms play a pivotal role in facilitating collective decision-making among its members:

a) Proposal and Voting:

- **Proposal:**
  - Submission of Proposals: Any member of the DAO has the right to propose actions for the organization, which can include decisions related to fund allocation, strategic directions, or proposals for new projects.
  - Content of Proposals: Proposals should provide a clear outline of their purpose, implementation plan, required resources, etc., enabling members to have a comprehensive understanding of the proposal's content.
  - Smart Contract Execution: Proposals are typically defined by smart contracts to ensure that their execution follows established rules without the need for central control.
- **Voting:**
  - Voting Rights: Members acquire voting rights based on their stake in the DAO (which could be the quantity of tokens held or other contribution metrics).
  - Voting Mechanism: Various voting mechanisms can be employed, such as one member, one vote, or token-weighted voting, depending on the DAO's design.
  - Transparency and Immutability: The voting process is recorded on the blockchain, ensuring transparency and immutability, allowing anyone to verify the voting results.
- **Voting Results:**
  - Decision-Making: Proposals need to garner sufficient support through votes to be accepted. Typically, reaching or surpassing a predetermined threshold triggers the execution of the proposal.
  - Smart Contract Execution: Once a proposal is approved, related smart contracts automatically execute the actions outlined in the proposal, such as fund allocation or changing the organization's state.

The proposal and voting mechanisms enable a decentralized and democratic governance process within a DAO. Each member has equal participation rights, and the transparency and auditability of voting results contribute to ensuring fairness and credibility in organizational decision-making. This design philosophy aims to eliminate centralized authority, fostering collective participation of DAO members in shaping the organization's future.

However, the DAO was also susceptible to vulnerabilities, and in June 2016, a hacker exploited a vulnerability in the smart contract, stealing around "$"50 million worth of Ethereum. This led to a contentious debate within the Ethereum community about how to handle the situation, and ultimately, a hard fork of the Ethereum blockchain was implemented to restore the stolen funds to their original owners.

Despite the controversy surrounding the DAO, it remains an important milestone in the development of blockchain technology, demonstrating the potential of decentralized autonomous organizations to enable new forms of collaboration and investment. Since then, there have been numerous other projects that have built on the DAO's ideas and sought to improve upon its flaws.

Since the DAO incident in 2016, the development of decentralized autonomous organizations (DAOs) has continued to evolve and expand, with new projects and platforms emerging to address the limitations of earlier attempts.

One of the most significant developments in recent years has been the emergence of DAO platforms that offer a more user-friendly and accessible way to create and manage decentralized organizations. These platforms provide tools and templates for creating DAOs, as well as built-in features such as voting, proposal submission, and fund management.

Some of the popular DAO platforms that have emerged in recent years include Aragon, MolochDAO, Colony, and DAOstack. These platforms enable anyone to create and participate in a decentralized organization, with a range of potential use cases such as investment funds, decentralized communities, and decentralized governance.

Another notable development in the DAO space has been the integration of blockchain technology with other emerging technologies, such as non-fungible tokens (NFTs) and decentralized finance (DeFi). For example, some DAOs are exploring the use of NFTs as a way to represent membership or ownership in the organization, while others are using DeFi protocols to manage and distribute funds.

Overall, the development of DAOs continues to evolve and mature, with new ideas and innovations emerging all the time. As blockchain technology and decentralized systems become more mainstream, it is likely that we will see an increasing number of DAOs being created and used for a variety of purposes.

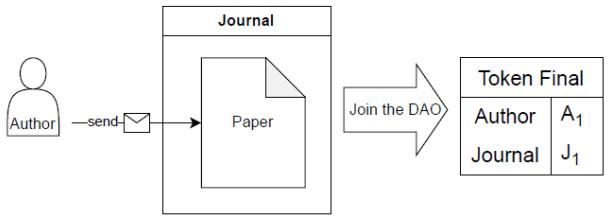

Fig. 6. Distribute Token by DAO

After the author publishes the paper in the Web3.0 journal, the paper is stored on a blockchain, afterthen TOKEN is distributed using the DAO framework.

For example, someone downloading papers will creates finance.The funds received will be distributed to all holders

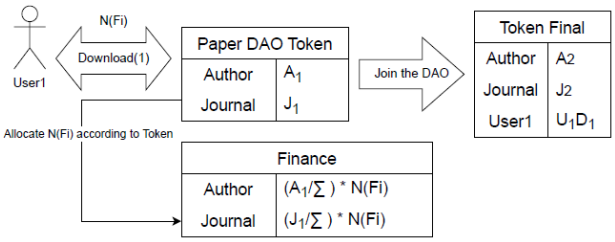

Fig. 7. Distribute Token while User Download

in proportion to the token of the DAO framework. After that, users who download the paper will also receive a certain token and will be able to share the funds later. In other words, the user who download thie paper also becomes a holder and also own this paper.

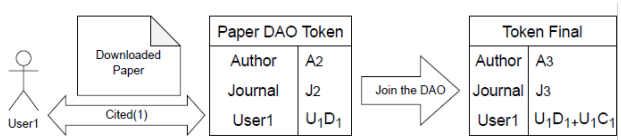

Fig. 8. Distribute Token while User Cite Downloaded Paper

After downloading the paper, user can cite this paper in own paper and can get more token.

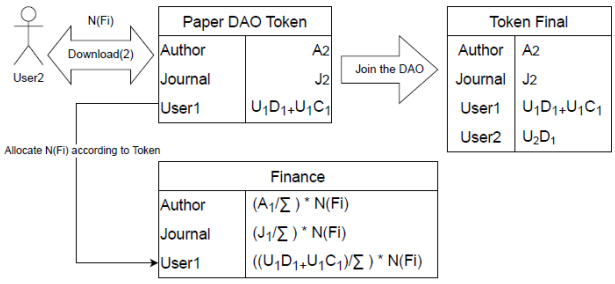

Fig. 9. Distribute Token while Another User Download

The currency paid by user2 when downloading the paper will continue to be distributed to all holders in proportion to the token. at this point, the holders already include user1. Both the author and the user who downloaded the paper will own the paper in proportion, and once the paper creates finance, it will be distributed to all owners.

V. DeFi Deduced

Defi deduced is a term that could be used to describe the process of applying deductive reasoning to the field of decentralized finance (defi). Deductive reasoning, or deduction, is making an inference based on widely accepted facts or premises. For example, one could deduce that a certain defi protocol is secure if it has been audited by a reputable firm and has no known vulnerabilities. Defi deduced could also refer to the outcome of such reasoning, such as a conclusion or a judgment about a defi project or phenomenon. For instance, one could deduce that the demand for defi services is increasing if the total value locked (TVL) in defi platforms is rising. Defi deduced could be seen as a way of applying logic and rigor to the analysis and evaluation of defi, which is a complex and dynamic domain that involves various aspects such as cryptography, economics, governance, and social behavior.

VI. Conclusion

DAOs have several advantages over traditional organizations, such as:

- Lower costs: DAOs eliminate the need for intermediaries, lawyers, accountants, or managers, reducing the overhead and bureaucracy involved in running an organization.
- Higher efficiency: DAOs enable faster and more accurate decision-making, as well as automated execution of tasks and transactions.
- Greater innovation: DAOs foster a culture of experimentation and creativity, as anyone can propose and contribute to new ideas or initiatives.
- Enhanced security: DAOs are protected by cryptography and consensus mechanisms, making them immune to hacking, fraud, or manipulation.
- Increased inclusivity: DAOs are open and accessible to anyone who shares the vision and values of the organization, regardless of their location, background, or status.

DAOs are not without challenges, however. Some of the main challenges include:

- Legal uncertainty: DAOs operate in a gray area of the law, as they do not fit into existing legal frameworks or jurisdictions. This creates risks and liabilities for the participants and the beneficiaries of the DAO.
- Ethical dilemmas: DAOs may face ethical issues or conflicts of interest, as they may not align with the moral values or social norms of the wider society.
- Technical complexity: DAOs rely on complex and experimental technologies, such as blockchain and smart contracts, which may have bugs, vulnerabilities, or unforeseen consequences.
- Governance issues: DAOs may struggle to achieve consensus, resolve disputes, or adapt to changing circumstances, as they lack a clear leadership or authority structure.

References

[1] L. Febvre and H.-J. Martin, *The coming of the book: the impact of printing 1450-1800*. Verso, 1997, vol. 10.
[2] J. Willinsky, *The access principle: The case for open access to research and scholarship*. Cambridge, Mass.: MIT Press, 2006.
[3] A. J. Meadows, *Communicating research*. Emerald Group Publishing Limited, 1997.
[4] A. Swan, *Policy guidelines for the development and promotion of open access*. UNESCO, 2012.
[5] M. Swan, *Blockchain: Blueprint for a new economy*. " O'Reilly Media, Inc.", 2015.
[6] W. Mougayar, *The business blockchain: promise, practice, and application of the next Internet technology*. John Wiley & Sons, 2016.
[7] S. Wang, W. Ding, J. Li, Y. Yuan, L. Ouyang, and F.-Y. Wang, "Decentralized autonomous organizations: Concept, model, and applications," *IEEE Transactions on Computational Social Systems*, vol. 6, no. 5, pp. 870–878, 2019.
[8] S. Nakamoto, "Bitcoin: A peer-to-peer electronic cash system," *Available at SSRN 3440802*, 2008.

[9] N. Radziwill, "Blockchain revolution: How the technology behind bitcoin is changing money, business, and the world," *The Quality Management Journal*, vol. 25, no. 1, pp. 64–65, 2018.
[10] P. Praitheeshan, L. Pan, J. Yu, J. Liu, and R. Doss, "Security analysis methods on ethereum smart contract vulnerabilities: a survey," *arXiv preprint arXiv:1908.08605*, 2019.

VII. Biography Section

If you have an EPS/PDF photo (graphicx package needed), extra braces are needed around the contents of the optional argument to biography to prevent the LaTeX parser from getting confused when it sees the complicated `\includegraphics` command within an optional argument. (You can create your own custom macro containing the `\includegraphics` command to make things simpler here.)

If you include a photo:

Michael Shell Use `\begin{IEEEbiography}` and then for the 1st argument use `\includegraphics` to declare and link the author photo. Use the author name as the 3rd argument followed by the biography text.

If you will not include a photo:

John Doe Use `\begin{IEEEbiographynophoto}` and the author name as the argument followed by the biography text.