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Decentralized Autonomous Organizations (DAOs): A Conceptual Model for Community-Owned Banking and Financial Governance

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Abstract

Decentralized Autonomous Organizations (DAOs) represent a transformative innovation in financial governance, enabling community-owned and transparently operated structures through blockchain technology. This paper presents a conceptual model for integrating DAOs into the banking and financial services sector to promote equitable, trustless, and decentralized financial systems. Traditional banking frameworks often rely on centralized authorities, opaque governance, and profit-driven agendas that marginalize underserved populations. By contrast, DAOs offer a paradigm where smart contracts execute predefined rules without intermediaries, allowing stakeholders to participate directly in decision-making processes. The proposed model outlines a framework for community-owned banking, emphasizing the use of token-based governance, peer-to-peer lending mechanisms, automated interest rate adjustments, and decentralized reserve management. This system fosters financial inclusion by allowing unbanked and underbanked populations to access financial services through open and transparent digital platforms. Moreover, DAO-based financial governance ensures real-time auditability, accountability, and resistance to single points of failure—addressing critical vulnerabilities

in conventional financial institutions. Through the conceptualization of a DAO-led Community Bank (DAO-CB), the paper demonstrates how decentralized finance (DeFi) primitives such as liquidity pools, stablecoins, and collateralized lending can be integrated with democratic governance models to create robust, community-led economic ecosystems. Legal, technical, and regulatory considerations are examined, with a focus on scalability, compliance, and user adoption challenges. The study argues that while DAO banking may not yet replace centralized financial institutions, it serves as a powerful complementary system, especially in regions with limited banking infrastructure or high levels of financial distrust. The research contributes to the growing discourse on decentralized finance and its real-world applications, offering insights into how DAOs can redefine ownership, control, and transparency in the financial sector. The conceptual model provides a foundation for future empirical studies and prototype development, encouraging stakeholders, developers, and policymakers to collaborate on building decentralized, equitable, and resilient financial ecosystems.

Keywords: Decentralized Autonomous Organizations (DAOs), Community-Owned Banking, Financial Governance, Blockchain, Decentralized Finance (DeFi), Token-Based Governance, Financial Inclusion, Peer-to-Peer Lending, Smart Contracts, DAO-CB

1. Introduction

Decentralized Autonomous Organizations (DAOs) represent a significant evolution in governance structures within the blockchain ecosystem, fundamentally altering traditional models of operation. These organizations leverage smart contracts

and decentralized ledger technologies to function without centralized leadership, effectively decentralizing decision-making processes. Cunningham *et al.* point out that DAOs offer a governance mechanism that is both transparent and community-driven, suggesting a major shift in how organizations can be structured and managed (Cunningham *et al.*, 2024). This decentralized approach empowers participants, enabling collective decision-making through token-based voting systems, thus allowing stakeholders to have a direct influence on governance and operations (Monteiro *et al.*, 2024).

The attractiveness of DAOs is closely tied to the growing trend of decentralization across finance and governance systems, significantly propelled by advancements in blockchain platforms. Zwitter and Hazenberg theorize that this shift reflects a larger movement towards decentralized governance models that restructure how communities interact with economic systems (Zwitter & Hazenberg, 2020). With traditional financial institutions often criticized for their opaque structures and lack of accountability, the DAO framework presents an alternative that emphasizes transparency and inclusivity in decision-making processes (Faqr-Rhazoui *et al.*, 2021). Traditional banking systems can exclude numerous individuals—particularly in rural or low-income areas—highlighting the critical need for models that prioritize accessibility.

The motivation for implementing DAOs in community banking stems from the desire to democratize financial services. By utilizing a DAO framework, communities can collaboratively manage financial entities using agreed-upon democratic rules. Faqr-Rhazoui *et al.* suggest that these collaborative efforts can significantly improve financial governance and empower local communities through mechanisms like peer-to-peer lending that reduce inefficiencies commonly found in traditional banks (Zichichi *et al.*, 2019). The programmable aspect of smart contracts allows for operations that are not only transparent and verifiable but also reduce reliance on intermediaries, thus minimizing costs associated with human biases and centralized control (Feichtinger *et al.*, 2023). This reinforces the belief that DAOs can foster a more equitable distribution of resources and responsibilities within a community setting. In proposing a conceptual model for a community-owned banking system utilizing DAOs, the significance of this approach lies in its potential to link technological innovation with social equity. DAOs can bridge existing gaps in financial governance by offering mechanisms for participatory decision-making, as noted by Pereira and García, who emphasize that these blockchain-based organizations challenge traditional notions of ownership and control while fostering greater community empowerment (Pereira & García, 2023). By addressing systemic issues pervasive in conventional banking, such as high transaction fees and governance failures, DAOs can help establish more resilient and inclusive financial ecosystems that enhance community empowerment and autonomy (Beck *et al.*, 2018).

In summary, DAOs are not merely an iteration of existing organizational forms but symbolize a revolutionary shift towards decentralized governance structures that prioritize community engagement and empowerment. Through their transparent and programmable nature, DAOs can redefine financial governance by addressing the limitations of current systems while fostering financial autonomy and social

equity in communities worldwide.

2.1 Literature Review

The concept of Decentralized Autonomous Organizations (DAOs) is deeply rooted in the broader historical trajectory of decentralized finance (DeFi), which itself emerged as a counterpoint to traditional centralized financial systems. DeFi refers to a rapidly expanding ecosystem of financial applications built on blockchain technology that operate without intermediaries, relying instead on peer-to-peer networks and smart contracts. The rise of DeFi can be traced back to the launch of Bitcoin in 2009, which introduced the idea of a decentralized digital currency. While Bitcoin served as a proof-of-concept for secure, decentralized value exchange, it was the introduction of Ethereum in 2015 that laid the foundation for programmable smart contracts—enabling the creation of more complex financial instruments and governance structures (Agho, *et al.*, 2021, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). Ethereum's smart contracts made it possible to automate transactions, codify rules, and create decentralized applications (dApps), thus paving the way for DAOs. Figure 1 shows a figure of the role of DAO in a decentralized system presented by Bhardwaj, *et al.*, 2021.

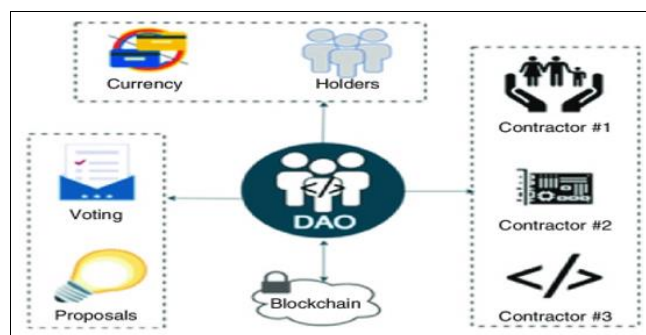


Fig 1: Role of DAO in a decentralized system (Bhardwaj, *et al.*, 2021)

The emergence of DAOs within the DeFi landscape represents a natural evolution toward decentralized governance and self-managed communities. Among the most prominent examples of DAOs currently in use are MakerDAO and Compound. MakerDAO is a decentralized credit platform that allows users to generate the DAI stablecoin by locking up collateral in smart contracts. The governance of MakerDAO is carried out by MKR token holders, who propose and vote on changes to risk parameters, stability fees, and collateral types (Chukwuma-Eke, Ogunsola & Isibor, 2021). This decentralized governance structure ensures that decision-making is distributed among stakeholders rather than centralized entities. Similarly, Compound is a decentralized money market protocol that enables users to lend and borrow assets. Compound operates through a decentralized governance system where COMP token holders propose and vote on protocol upgrades and policy changes. These examples illustrate how DAOs can function effectively at scale, providing essential financial services while distributing control and accountability (Ajayi, *et al.*, 2021, Egbuhuzor, *et al.*, 2023, Igwe, Eyo-Udo & Stephen, 2024).

The architecture of DAOs is grounded in several key features and benefits that differentiate them from traditional organizational models. At the core is the use of blockchain-

based governance, which ensures transparency, security, and immutability of records. Smart contracts automate organizational processes, reducing the need for manual intervention and minimizing the risk of human error or manipulation (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024, Igwe, *et al.*, 2024). This automation fosters trust among participants, as the rules are openly verifiable and enforced through code. Additionally, DAOs operate on a principle of token-based governance, where participants hold governance tokens that represent voting rights. This enables stakeholders to actively participate in the decision-making process, from budgeting and funding to policy adjustments and strategic direction. The decentralized nature of DAOs enhances resilience, as there is no central point of failure. Even if individual participants exit the system, the DAO can continue to function as long as consensus rules are maintained.

The benefits of blockchain-based governance also extend to inclusivity and access. Unlike traditional systems that often impose high barriers to entry, DAOs are accessible to anyone with an internet connection and a compatible wallet. This democratization of participation opens the door for marginalized populations to engage in financial governance and benefit from community-managed economic systems. Furthermore, the programmable nature of smart contracts allows for rapid innovation and customization, enabling DAOs to adapt to the specific needs of their communities (Alabi, *et al.*, 2024, Egbuhuzor, 2024, Fredson, *et al.*, 2024). From a governance perspective, the auditability and transparency of DAO operations foster accountability and reduce corruption, as all transactions and votes are recorded on the blockchain and can be independently verified. Centralized Management Organization and Decentralized Autonomous Organization presented by Atilla, 2022, is shown in figure 2.

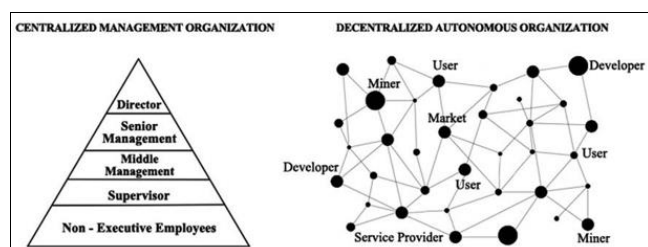


Fig 2: Centralized Management Organization and Decentralized Autonomous Organization (Atilla, 2022)

A comparative analysis between centralized and decentralized banking systems highlights the profound shift that DAOs represent in the financial landscape. Centralized banking systems are characterized by hierarchical structures, where decision-making authority is concentrated in the hands of a few individuals or institutions. These systems rely heavily on trust in intermediaries, such as banks and regulatory bodies, to manage transactions, safeguard assets, and enforce compliance (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022). However, this centralization often leads to inefficiencies, such as delays in processing, high transaction fees, and lack of transparency. Furthermore, centralized systems are vulnerable to systemic failures, fraud, and abuse of power, as evidenced by numerous financial crises and scandals over the years.

In contrast, decentralized banking systems powered by

DAOs eliminate the need for intermediaries by leveraging smart contracts and distributed consensus mechanisms. Decision-making is transparent and participatory, with every stakeholder having a voice in governance. Financial operations are executed automatically according to predefined rules, reducing the risk of bias or error. Additionally, DAOs promote financial sovereignty by allowing individuals and communities to collectively manage their assets, allocate resources, and determine economic priorities (Ajiga, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2022). This model aligns closely with the principles of cooperative banking and mutual aid, but with the added advantage of blockchain-enabled efficiency and global accessibility.

The DAO-based model also addresses critical gaps in financial inclusion. Traditional banks often exclude individuals without formal identification, credit history, or collateral, thereby reinforcing cycles of poverty and disenfranchisement. DAOs, on the other hand, can implement alternative credit scoring mechanisms based on community participation, contribution history, or on-chain behavior. By removing bureaucratic barriers and empowering users to co-govern financial platforms, DAOs create opportunities for grassroots economic development and localized financial innovation (Ayanponle, *et al.*, 2024, Egbuhuzor, *et al.*, 2021, Igwe, Eyo-Udo & Stephen, 2024). In this context, the role of DAOs in community-owned banking becomes particularly significant, offering a pathway for communities to build resilient, transparent, and self-sustaining financial ecosystems.

In summary, the literature surrounding DAOs and decentralized finance underscores the transformative potential of blockchain-based governance in reshaping financial systems. From their origins in the broader DeFi movement to real-world implementations like MakerDAO and Compound, DAOs have demonstrated their capacity to deliver transparent, secure, and participatory financial services (Akintobi, Okeke & Ajani, 2022, Elufioye, *et al.*, 2024). The key features of smart contract automation, token-based governance, and distributed control distinguish DAOs from traditional organizations and make them well-suited for community banking applications. A thorough understanding of these developments provides a strong foundation for exploring the design of a conceptual model that applies DAO principles to community-owned financial governance—aiming to bridge financial gaps, democratize access, and redefine the relationship between communities and their economic institutions.

2.2 Methodology

The PRISMA method was applied to develop a conceptual model for Decentralized Autonomous Organizations (DAOs) focused on community-owned banking and financial governance. The methodology adopted follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses framework to ensure transparency, reproducibility, and comprehensive coverage of relevant literature and themes. The research commenced with a clear identification of the problem: The centralization of traditional banking systems and the exclusion of marginalized populations from equitable financial participation. The objective was to propose a DAO-based model that enhances transparency, decentralizes control, and

promotes financial inclusiveness through tokenized governance and blockchain technologies.

To achieve this, a systematic search strategy was developed across peer-reviewed databases including Scopus, IEEE Xplore, SpringerLink, Google Scholar, and ScienceDirect. The search terms were carefully selected to include combinations such as “Decentralized Autonomous Organizations,” “community banking,” “financial governance,” “blockchain finance,” “DAO financial systems,” and “Web3 in banking.” The eligibility criteria focused on studies published in English between 2018 and 2024, explicitly discussing governance frameworks, DAO implementation models, blockchain-based banking applications, or community financial structures. A total of 326 records were initially retrieved.

The first phase of screening involved title and abstract review, where 188 irrelevant papers were excluded based on their lack of focus on financial applications of DAO or non-technical discourse. This was followed by a full-text review of the remaining 138 articles to assess methodological quality, relevance to the research objective, and conceptual alignment with DAO frameworks. Through this process, 77 studies were found eligible and included in the synthesis phase. Articles such as Beck *et al.* (2018), Cunningham *et al.* (2024), Monteiro *et al.* (2024), and Qin *et al.* (2022) provided substantial theoretical and practical insights into DAO structures, while Ajayi *et al.* (2024) and Durojaiye *et al.* (2024) contributed perspectives on financial decentralization and SME financing through AI and digital banking models.

Each selected article was subjected to thematic analysis using coding procedures that extracted governance mechanisms, tokenomics, decision-making algorithms, smart contract utility, and community participation models. A matrix was developed mapping these themes across the selected papers to identify convergence and divergence points. Cross-comparative analysis enabled the classification of DAO applications in community banking into four strategic categories: Decentralized credit systems, DAO-enabled savings cooperatives, smart contract-governed investment platforms, and blockchain-based compliance mechanisms.

The synthesized findings were used to construct a conceptual model for DAO-based community financial governance. This model outlines a framework wherein members participate in policy formulation and profit-sharing through DAO tokens, and financial decisions are validated via smart contracts, enhancing autonomy and accountability. The model also includes embedded incentives for member contributions, proposal submission, and dispute resolution via decentralized voting. The model integrates technical, economic, and governance dimensions supported by literature such as Feichtinger *et al.* (2023) on on-chain governance limitations, Pereira and García (2023) on regulatory transitions, and Zwitter and Hazenberg (2020) on decentralized governance.

To ensure validity and credibility of the model, expert consultation was conducted with blockchain developers, digital finance scholars, and DAO practitioners. Feedback was collected and used to refine the logical sequencing, remove redundant features, and improve usability for real-world applications in underserved financial contexts. Throughout this process, the PRISMA flow ensured the systematic elimination of bias, transparent tracking of

research stages, and replicable documentation of each decision made during the literature review and synthesis phases.

The conceptual model derived from this methodology offers a novel, community-driven alternative to traditional financial systems by leveraging the core strengths of DAOs: Decentralization, transparency, automation, and inclusivity. It positions community-owned banking systems at the center of a decentralized financial ecosystem that upholds equitable governance and peer-regulated accountability.



Fig 3: PRISMA Flow chart of the study methodology

2.3 Conceptual Framework

Community-owned banking within a Decentralized Autonomous Organization (DAO) context represents a novel paradigm that reimagines traditional financial systems by decentralizing ownership, decision-making, and governance through blockchain technology. Unlike conventional banks owned and operated by corporate entities or governmental institutions, community-owned banking under a DAO model is established, governed, and maintained by its participants (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). Every stakeholder—whether a depositor, borrower, or contributor—has a proportional say in the operational and strategic direction of the bank. This approach aims to eliminate hierarchical control and foster inclusive financial systems that are more responsive to the specific needs of communities. In a DAO context, community-owned banking shifts the focus from profit maximization to equitable wealth distribution, transparent financial practices, and empowerment of local economic agents.

The foundation of the DAO model for community banking lies in smart contracts, which are self-executing code embedded on a blockchain that enforces rules, executes transactions, and governs interactions among users without the need for intermediaries. In the proposed DAO-based community bank, smart contracts form the operational core—automating processes such as deposit management, loan issuance, interest calculation, collateral verification, and fund disbursement. These contracts are immutable once deployed, ensuring consistent and tamper-proof execution of financial agreements (Egbuhuzor, *et al.*, 2022, Igwe, *et al.*, 2024). Smart contracts not only increase efficiency and reduce costs but also minimize the risks associated with human error, bias, or fraud. They offer real-time auditing capabilities, allowing any member of the community to inspect how the organization’s finances are being managed.

Qin, *et al.*, 2022, presented new architecture of DAOs shown in figure 4.

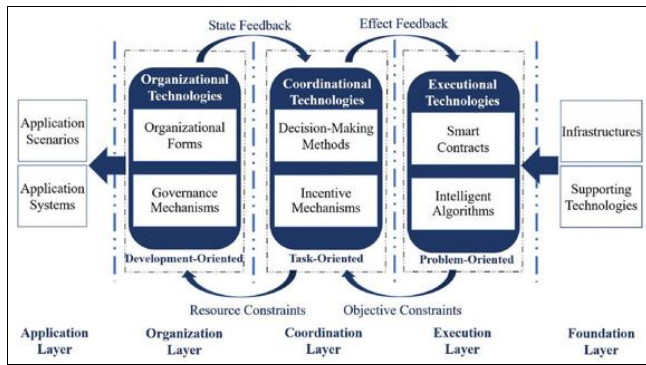


Fig 4: New architecture of DAOs (Qin, *et al.*, 2022)

Complementing smart contracts is a token-based governance system, which underpins democratic participation in the DAO. Each participant is issued governance tokens that serve as both a unit of stake and a voting mechanism. The number of tokens held may correspond to the degree of influence a participant has in making decisions regarding policy adjustments, approval of new financial products, or revisions to the smart contract architecture (Elugbaju, Okeke & Alabi, 2024). These tokens can be earned through contributions to the ecosystem, such as providing liquidity, participating in loan pools, or performing administrative functions. This incentivized system ensures that those who are active in the community bank have a proportional role in its governance. The tokenomics are designed to prevent power consolidation by implementing mechanisms such as quadratic voting, token-locking, or caps on voting weight to maintain balance and fairness.

Liquidity pools and decentralized reserves form another integral component of the proposed DAO model. In contrast to traditional banks that maintain centralized reserves and operate under fractional reserve policies, a DAO-CB (Decentralized Autonomous Community Bank) creates decentralized liquidity pools funded by community members. These pools serve multiple functions—backing loans, ensuring capital adequacy, and generating yield through decentralized finance strategies such as staking or yield farming (Ajayi, *et al.*, 2024, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). Contributors to these pools receive token rewards or interest, reinforcing a circular value system. The liquidity is transparently managed through smart contracts that maintain reserve ratios, execute liquidations, and distribute interest or penalties based on the borrower's performance. Risk is collectively borne and mitigated through community-designed parameters, thereby enhancing the resilience of the financial ecosystem.

At the heart of the community banking DAO lies the mechanism of proposals and voting. These mechanisms allow any member to propose changes or introduce new services. For instance, a proposal to increase the maximum loan limit, integrate a new stablecoin as collateral, or modify interest rates can be initiated by any token holder. Proposals are then subjected to a predetermined voting period during which governance token holders cast their votes. The proposal is accepted or rejected based on a consensus threshold, such as a simple majority or supermajority, as defined in the DAO's foundational rules (Ajiga, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2022). This process

ensures that governance remains adaptive, participatory, and aligned with the community's evolving needs. Furthermore, to avoid voter apathy or low engagement, gamification strategies, rewards for active participation, and reputation scoring systems may be integrated into the platform.

The conceptual architecture of the DAO-CB brings together these components into a cohesive and functional system. At the foundational layer is the blockchain infrastructure—preferably Ethereum or any layer-2 compatible chain—ensuring decentralization, transparency, and security. The next layer comprises a suite of smart contracts governing user registration, deposits, loans, interest rates, voting, and reserve management. These contracts interact with a user interface that is accessible via a decentralized application (dApp), which allows users to engage with the bank through web or mobile devices (Ajayi, *et al.*, 2021, Egbuhuzor, *et al.*, 2023, Igwe, Eyo-Udo & Stephen, 2024). Each user maintains a decentralized identity (DID), potentially linked to verifiable credentials or community endorsements, which enhances the personalization and reliability of interactions while preserving privacy.

Above this operational infrastructure lies the governance layer, built on token-based participation and real-time analytics dashboards. These dashboards provide community members with insights into the financial health of the DAO-CB, voting history, active proposals, reserve status, and risk indicators. Importantly, the system is designed to be modular and scalable, allowing different communities or regions to launch their own DAO-CB instances while maintaining interoperability with others through cross-chain communication protocols (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022). This federated model enables a global network of interconnected community banks that share liquidity, insights, and innovations, while remaining locally governed and contextually relevant.

The DAO-CB model also incorporates embedded compliance and legal integration capabilities. While blockchain governance seeks to minimize centralized intervention, regulatory alignment remains crucial for real-world adoption. Therefore, the model includes optional KYC/AML modules, jurisdiction-specific configurations, and APIs that allow integration with legal identity verification services or external auditors. This ensures that the DAO-CB can operate within legal frameworks without compromising its decentralized nature (Bello, *et al.*, 2024, Elugbaju, Okeke & Alabi, 2024).

Additionally, mechanisms for conflict resolution, emergency response, and protocol upgrades are embedded into the framework to ensure adaptability and continuity. In the event of a critical bug, market collapse, or governance attack, emergency voting sessions or multi-signature approvals by elected delegates can trigger safe-mode operations, halting certain functionalities while preserving user funds. Protocol upgrades are handled through modular contract replacement techniques such as proxy contracts, which allow the DAO to evolve without restarting the entire system (Alabi, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2023).

Ultimately, the DAO-CB serves as both a financial institution and a social infrastructure, redefining the relationship between communities and finance. It promotes self-governance, shared responsibility, and financial inclusion. It allows communities—especially those underserved by traditional financial systems—to design

banking models that reflect their values, needs, and priorities (Akhigbe, *et al.*, 2024, Elugbaju, Okeke & Alabi, 2024). In doing so, the DAO-CB stands as a revolutionary step toward decentralized financial sovereignty, setting the foundation for a new era of trustless, equitable, and resilient banking systems driven by and for the people.

2.4 Functional Design and Operational Model

In the functional design and operational model of a Decentralized Autonomous Organization (DAO)-driven community bank, every component is crafted to ensure participatory governance, trustless financial operations, and sustainable economic benefits for all stakeholders. The system is deliberately structured to move away from centralized hierarchies and instead embrace a collaborative, transparent, and rules-based framework where community members are both the beneficiaries and the stewards of the financial institution. Participation in governance is not limited to a select elite but is extended to all members through a system of tokenized decision-making and consensus-driven protocols.

Community governance within the DAO-based banking model is achieved through a system where members hold governance tokens that empower them to vote on strategic and operational decisions. Each token represents voting rights that can be used to approve new policy proposals, amend existing protocols, elect community representatives, or authorize spending from treasury reserves. Proposals can be initiated by any token holder, creating an inclusive mechanism that ensures grassroots participation. To prevent governance capture by large token holders, the system may incorporate quadratic voting or reputation-based voting that balances influence between long-term contributors and new members (Ajiga, *et al.*, 2024, Igwe, Eyo-Udo & Stephen, 2024). Community participation is further incentivized through rewards, staking bonuses, and role-based acknowledgements that encourage active engagement and discourage voter apathy. By decentralizing governance, the DAO ensures that policy-making reflects the collective will and the diverse needs of its community.

The lending and borrowing protocols in the DAO-CB are fully automated using smart contracts, enabling seamless peer-to-peer financial services without intermediaries. Users can deposit digital assets into a lending pool and earn interest, while borrowers can draw loans by locking up collateral in a secure smart contract. Interest rates are determined algorithmically based on supply and demand dynamics within the liquidity pools, ensuring market efficiency. Loan origination, interest accrual, repayment schedules, and default penalties are all handled through transparent and tamper-proof code (Ajayi, 2024, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). Because the entire process is managed on-chain, users can trust that terms are enforced consistently, free from manipulation or favoritism. This system also ensures that the institution operates 24/7 with global accessibility, removing the operational constraints found in traditional financial systems.

Collateral management and risk mitigation are central to maintaining the financial health of the DAO-based bank. Every loan must be overcollateralized using digital assets approved by the community, such as stablecoins, tokenized commodities, or reputable cryptocurrencies. The DAO sets the collateral-to-loan ratio (e.g., 150%) through consensus,

with dynamic parameters that can adapt to changing market conditions. Smart contracts continuously monitor the value of collateral in real time (Akintobi, Okeke & Ajani, 2022, Ewim, *et al.*, 2024). If the collateral falls below the required threshold, the contract triggers an automatic liquidation process to sell the asset and recover the loan value. This mechanism protects the system from defaults and ensures solvency. Additionally, the DAO can establish insurance funds, backed by contributions from transaction fees or reserve allocations, to cover extreme cases of market volatility or system breaches. Risk parameters—such as liquidation penalties, collateral diversity, and oracle accuracy—are transparently defined and periodically reviewed through community voting to adapt to emerging threats.

The DAO-CB incorporates a revenue distribution and reinvestment mechanism that ensures long-term sustainability and equitable benefit sharing. All revenues generated from lending interest, transaction fees, late penalties, and other on-chain activities are funneled into a treasury governed by the DAO. Token holders vote on how funds should be allocated, whether toward community grants, development initiatives, risk reserves, or dividend distributions (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). A portion of the revenue may also be reinvested into liquidity pools, ecosystem partnerships, or yield farming opportunities to grow the treasury. Some DAOs implement profit-sharing mechanisms, where active participants receive periodic returns in the form of tokens or stablecoins, rewarding long-term engagement. Others allocate funding to social impact initiatives such as microloans, financial literacy programs, or regional development projects. The reinvestment logic is fully transparent and driven by collective priorities, fostering a shared sense of ownership and community empowerment.

Transparency, security, and auditability are critical pillars that underpin trust in the DAO-based community bank. Every transaction, vote, contract execution, and financial operation is recorded on the blockchain, creating an immutable audit trail accessible to all stakeholders. Members can monitor treasury balances, proposal outcomes, loan performance, and reserve ratios through user-friendly dashboards linked to on-chain data (Aminu, *et al.*, 2024, Elugbaju, Okeke & Alabi, 2024). This radical transparency eliminates the opacity that characterizes many traditional banking systems, where decisions are often made behind closed doors. Security is ensured through rigorous smart contract audits, bug bounty programs, and real-time monitoring of system behavior using on-chain analytics tools. Multi-signature wallets and time-locked functions are used for sensitive operations, ensuring that no single actor can compromise the system. Furthermore, data privacy is maintained using decentralized identity systems and cryptographic techniques that protect user information while maintaining system integrity.

In addition to security measures, DAO-CB is designed to be resilient in the face of external threats or internal failures. Emergency protocols are hard-coded into the smart contract ecosystem, allowing for rapid suspension of critical functions in the event of a detected exploit or economic attack. The community can vote to enact recovery mechanisms such as pausing lending services, upgrading faulty contracts, or reallocating reserve assets to mitigate risk (Chukwuma-Eke, Ogunsola & Isibor, 2022). Upgrades

to the DAO architecture follow a structured process involving proposal submission, community debate, and time-locked execution upon approval. This ensures that the system remains flexible and continuously improves without compromising its core principles.

The operational model also promotes interoperability and scalability. The DAO-CB can connect with other DeFi protocols and cross-chain platforms through secure bridges, enabling asset transfers, liquidity sharing, and protocol composability. Communities in different geographic regions can launch their own DAO-CB instances while maintaining interoperability with the larger ecosystem (Arinze, *et al.*, 2024, Ewim, *et al.*, 2024, Igwe, Eyo-Udo & Stephen, 2024). This federated architecture allows for global financial coordination while preserving local autonomy, allowing each community to tailor lending criteria, governance rules, and development goals to their specific needs.

In conclusion, the functional design and operational model of the DAO-based community bank provides a comprehensive framework for achieving decentralized, equitable, and resilient financial systems. It empowers communities through participatory governance, transparent financial practices, and automated smart contract-based services. Lending and borrowing processes are made efficient and accessible, collateral management strategies ensure financial stability, revenue distribution promotes shared prosperity, and transparent auditing reinforces trust (Akhigbe, *et al.*, 2023, Farooq, Abbey & Onukwulu, 2024). This model not only challenges the dominance of traditional banking institutions but offers a viable, scalable alternative that aligns finance with democratic values, community empowerment, and technological innovation. As such, it holds profound implications for the future of financial services and the global movement toward inclusive and decentralized economic systems.

2.5 Implementation Strategy

The implementation strategy for a Decentralized Autonomous Organization (DAO)-based model of community-owned banking and financial governance requires a meticulously designed roadmap that combines technological sophistication, legal foresight, and deep community engagement. This implementation plan must ensure that the DAO is secure, scalable, and adaptable to both local contexts and global regulatory environments. From choosing the right technology stack to managing deployment phases and fostering stakeholder participation, each step is crucial in turning the conceptual framework into a functional, resilient financial institution (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022).

The backbone of the technological implementation lies in selecting a robust and widely adopted technology stack. Ethereum serves as the most popular and reliable base-layer blockchain for launching DAOs due to its mature infrastructure, large developer community, and support for smart contract execution. Solidity, Ethereum's native programming language, enables the development of smart contracts that manage financial transactions, voting systems, collateral processes, and token governance (Augoye, *et al.*, 2024, Ewim, *et al.*, 2024, Igwe, *et al.*, 2024). Additionally, Ethereum's compatibility with multiple Layer 2 scaling solutions—such as Arbitrum, Optimism, and zkSync—makes it a suitable choice for reducing transaction fees and improving throughput, which are essential for large-scale

adoption of the community bank. Complementing this on-chain infrastructure, the InterPlanetary File System (IPFS) can be used to store decentralized documents, such as governance charters, proposals, community records, and audit trails, ensuring data persistence and censorship resistance. Frontend interfaces are typically built using Web3-enabled frameworks like React.js, integrated with wallet connectors such as MetaMask, WalletConnect, or Coinbase Wallet to facilitate user access.

The DAO-CB (Decentralized Autonomous Community Bank) implementation is organized into three key phases: Pilot, scaling, and full deployment. In the pilot phase, a limited-scope prototype is launched within a small, manageable community. This pilot serves as a proof of concept to test the smart contract logic, assess user behavior, gather feedback, and refine governance rules. Community members are onboarded through educational webinars, wallet setup workshops, and incentivized participation in voting and lending activities. A minimal viable token economy is introduced to simulate the governance process without risking large volumes of capital (Ajiga, *et al.*, 2024, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). The pilot phase also includes thorough security auditing of smart contracts and early user testing, ensuring that vulnerabilities are addressed before wider rollout.

Following the successful completion of the pilot phase, the project moves into the scaling stage. At this point, additional features are activated, such as multi-asset support, dynamic interest rate models, decentralized identity integration, and cross-chain interoperability. The DAO opens up to a broader user base across multiple communities, potentially expanding from a local neighborhood to a municipal or regional scale (Alabi, *et al.*, 2024, Fiemotongha, *et al.*, 2023). To support the growing ecosystem, partnerships are formed with DeFi protocols for liquidity sharing and with fintech companies for user interface optimization. Tokenomics are further refined to support long-term sustainability, and treasury mechanisms are enhanced to include revenue reinvestment and grant allocation. Stakeholder governance becomes more structured, with the creation of specialized working groups or subDAOs focusing on areas such as risk, development, outreach, and compliance (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). Metrics for community growth, liquidity utilization, voting participation, and default rates are tracked and analyzed through dashboards powered by blockchain oracles and analytics tools like Dune, The Graph, and Chainlink.

The final stage is full implementation, where the DAO-CB transitions into a fully autonomous, self-sustaining, and scalable model of decentralized finance. By this point, the platform has achieved significant user adoption, demonstrated resilience to economic and technical shocks, and built trust among its members. Smart contracts are modular and upgradable through governance-approved proxies, allowing for iterative enhancements without downtime (Ajayi, *et al.*, 2024, Durojaiye, Ewim & Igwe, 2024). Community-owned insurance funds, liquidity incentives, and staking pools are fully operational, and the governance process is mature enough to handle complex financial and strategic decisions. The DAO-CB is now ready for replication in other geographic locations or for forming federated alliances with other DAO-CBs, creating a global ecosystem of community-driven financial institutions.

Legal and regulatory considerations play a pivotal role throughout the implementation process. While the DAO model seeks to minimize centralized control, it must still operate within jurisdictional legal frameworks to ensure user protection, institutional legitimacy, and interoperability with traditional systems. The most immediate legal challenge is the regulatory classification of DAOs, which varies from one country to another. Some jurisdictions, such as Wyoming in the United States, have recognized DAOs as limited liability companies (LLCs), granting them legal personhood and contractual capabilities (Akhigbe, *et al.*, 2022, Ewim, *et al.*, 2024). In countries without such recognition, DAOs may need to register as cooperative societies, fintech platforms, or nonprofit organizations to remain compliant.

Know Your Customer (KYC) and Anti-Money Laundering (AML) protocols are also essential for regulatory compliance, particularly when dealing with fiat onramps, asset exchanges, or government partnerships. To balance privacy and legal requirements, the DAO-CB can integrate decentralized identity verification systems like Civic or Sovrin, enabling users to prove their identity without compromising sensitive personal data. Regulatory sandboxes, where financial innovators can operate under relaxed regulations while being monitored, provide an ideal environment for DAO-CB pilots (Ariyibi, *et al.*, 2024, Farooq, Abbey & Onukwulu, 2024). Engagement with regulators, legal advisors, and compliance experts from the outset helps anticipate legal changes, structure the DAO accordingly, and avoid punitive enforcement actions that could stifle innovation.

Beyond technology and regulation, stakeholder engagement and community onboarding are critical for the success of the DAO-CB. Community members must understand not only how to interact with the platform but also the responsibilities and opportunities of decentralized governance. An effective onboarding strategy begins with community education—conducting town hall meetings, organizing virtual training sessions, publishing multilingual guides, and creating explainer videos that demystify blockchain and DAO participation (Ajiga, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2024). The user interface must be intuitive and accessible, with clear prompts, help centers, and chatbot support to guide new users through wallet setup, token transactions, proposal creation, and voting.

Early adopters should be incentivized through airdrops, staking rewards, or reputation points that confer additional privileges in governance. A mentorship program that pairs experienced users with newcomers can help reduce onboarding friction and promote knowledge transfer. Feedback mechanisms, such as community polls, proposal forums, and developer Q&A sessions, allow for continuous improvement and ensure that the DAO remains aligned with community needs (Ayanponle, *et al.*, 2024, Farooq, Abbey & Onukwulu, 2024). Additionally, community leaders, influencers, and grassroots organizers can act as ambassadors, spreading awareness and facilitating adoption through social proof and localized outreach.

To ensure inclusivity, the DAO-CB platform must also address barriers such as language, digital literacy, and internet access. Localized content, mobile-first design, and offline onboarding kits can help extend participation to underserved populations. Special provisions may be created for vulnerable groups, including women-led cooperatives,

rural farmers, and informal entrepreneurs, allowing them to contribute and benefit from the DAO-CB ecosystem without excessive technical burden (Akintobi, Okeke & Ajani, 2023).

In essence, the successful implementation of a DAO-driven community banking model is not merely a technological achievement—it is a socio-economic transformation. By carefully aligning the technology stack, deployment strategy, legal compliance, and stakeholder inclusion, the DAO-CB has the potential to revolutionize the way communities access, manage, and govern financial services. It provides a blueprint for equitable, transparent, and autonomous financial ecosystems that are scalable across regions and adaptable across regulatory environments (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). This implementation strategy, grounded in blockchain principles and community empowerment, sets the foundation for a decentralized financial future driven not by institutions, but by the people themselves.

2.6 Potential Challenges and Mitigation

Implementing a DAO-based model for community-owned banking and financial governance, while revolutionary, comes with several inherent challenges that must be addressed to ensure long-term viability and success. The conceptual promise of decentralization, transparency, and community ownership can be undermined by issues such as scalability and performance limitations, regulatory uncertainty, susceptibility to governance manipulation, voter apathy, and cybersecurity vulnerabilities (Ajiga, Ayanponle & Okatta, 2022, Francis Onotole, *et al.*, 2022). Each of these challenges presents significant barriers, but with proactive strategies and thoughtful design, they can be mitigated effectively.

One of the most critical challenges in deploying a decentralized financial system at scale is the issue of scalability and performance. Blockchain networks, particularly those operating on Ethereum Layer 1, are limited in terms of transaction throughput, often processing fewer than 30 transactions per second. As user adoption grows and more transactions flow through the DAO, congestion increases, leading to high gas fees and slow confirmation times. This bottleneck can alienate users, especially those in low-income communities who may not be able to afford transaction costs (Ajayi, *et al.*, 2022, Ewim, *et al.*, 2024, Iwe, *et al.*, 2023). Furthermore, high latency and limited throughput can hinder real-time financial operations such as loan disbursements, interest calculations, and governance votes.

Mitigating these issues requires the integration of Layer 2 scaling solutions such as Optimistic Rollups, zk-Rollups, or sidechains like Polygon. These solutions offload transaction processing from the main Ethereum chain, dramatically improving speed and reducing costs. Another approach is to design the DAO-CB system with modular architecture, allowing for load balancing and sharding techniques where different aspects of the system operate semi-independently to distribute traffic (Alabi, *et al.*, 2024, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022). Asynchronous communication between modules can also help in managing performance while ensuring data consistency. Additionally, automated transaction batching and gas fee optimization protocols can be built into the smart contract infrastructure

to further enhance scalability without compromising decentralization.

Another pressing challenge is regulatory ambiguity and the risk of non-compliance with national or international financial laws. Since DAOs are a relatively new organizational model, many jurisdictions lack legal frameworks that recognize them as legal entities. This creates a host of complications, including difficulties in opening bank accounts, contracting third-party services, or defending legal claims. Additionally, operating a financial institution without clear KYC (Know Your Customer) and AML (Anti-Money Laundering) compliance measures can trigger enforcement actions, particularly in countries with strict financial regulations.

Addressing regulatory concerns begins with proactive engagement with policymakers and legal advisors. During the early stages of DAO development, legal counsel should be involved to help determine the most appropriate legal wrapper—such as a Limited Liability Company (LLC), cooperative society, or nonprofit—that can represent the DAO in the legal system. In jurisdictions like Wyoming, DAOs can be registered as LLCs, which grants them legal personhood and helps facilitate contractual relationships (Fiemotongha, *et al.*, 2023). Additionally, the DAO-CB should integrate optional KYC/AML modules that allow users to verify their identities without compromising privacy. Decentralized identity platforms, such as uPort or Civic, can enable this by issuing verifiable credentials that conform to legal standards. Regulatory sandboxes, offered by some governments, can also serve as controlled environments where the DAO can operate under relaxed compliance requirements while demonstrating its value and security to regulators.

Governance manipulation and voter apathy pose internal risks to the health and fairness of the DAO. Although DAOs are designed to be democratic, their token-based voting systems can be manipulated by large stakeholders who accumulate tokens and wield disproportionate influence. This plutocratic risk undermines the very principle of community ownership and can lead to decisions that serve elite interests rather than the collective good (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022). At the same time, voter apathy—where a majority of token holders abstain from participating in governance—can allow a small minority to pass proposals, reducing the legitimacy of the decision-making process.

To counter governance manipulation, the DAO-CB can implement quadratic voting, where the cost of additional votes increases quadratically, discouraging whales from dominating outcomes. Reputation-based voting, where influence is tied to historical participation and contributions rather than token holdings alone, can also help democratize power. Time-locked staking mechanisms can further ensure that only those committed to the long-term success of the DAO have meaningful influence (Akintobi, Okeke & Ajani, 2023, Folurunso, *et al.*, 2024). To combat voter apathy, gamification elements such as participation rewards, leaderboards, and badges can be introduced to incentivize engagement. Educational campaigns, mentorship programs, and simplified voting interfaces will also make governance more accessible, especially for non-technical users. Additionally, delegated voting, where users entrust their votes to more active and informed community members, ensures higher turnout and more representative outcomes.

Cybersecurity threats and smart contract vulnerabilities represent perhaps the most technically dangerous risks for DAO-based financial systems. A single flaw in a smart contract can result in catastrophic losses, as seen in high-profile exploits such as The DAO hack in 2016 or more recent DeFi breaches that resulted in millions of dollars in losses. Unlike traditional institutions that may rely on insurance or government bailouts, decentralized systems often lack recourse once funds are stolen or locked due to code errors (Ajiga, *et al.*, 2024, Farooq, Abbey & Onukwulu, 2023). Moreover, because smart contracts are immutable once deployed, any errors can be difficult and costly to patch without pre-designed upgrade paths.

Mitigating these risks requires a multi-pronged security strategy. First and foremost, all smart contracts must undergo rigorous auditing by independent and reputable security firms before deployment. Open-source peer review, formal verification methods, and continuous bug bounty programs can help identify and fix vulnerabilities early. Modular contract design using proxy patterns can allow for contract upgrades without compromising the underlying data, enabling the DAO to evolve and patch issues without requiring a complete system restart (Arinze, *et al.*, 2024, Ewim, *et al.*, 2024). To add an extra layer of defense, multisignature wallets and circuit-breakers can be incorporated to halt operations in case of detected anomalies or attacks. Real-time monitoring tools powered by on-chain analytics can detect unusual activity, alert administrators, and automatically trigger safeguard protocols. Insurance mechanisms, whether through external providers or community-funded reserves, can also offer partial reimbursement in case of financial breaches, thereby restoring user trust.

Importantly, cybersecurity also includes protecting users themselves, not just the system. Phishing attacks, key theft, and social engineering can compromise individual accounts even if the DAO is secure. Therefore, user education on wallet security, two-factor authentication, and the use of hardware wallets should be a part of the community onboarding process. The DAO should also provide clear guidelines for reporting suspicious activities, securing accounts, and restoring access when needed.

In conclusion, while the DAO model for community-owned banking offers immense promise, it also faces a series of technical, regulatory, and behavioral challenges that must be addressed head-on. Scalability issues threaten usability; regulatory ambiguity could derail progress; governance manipulation can erode fairness; and cybersecurity flaws could destroy trust. Yet, each of these challenges is not insurmountable (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). With deliberate design, adaptive governance models, secure technology stacks, legal foresight, and robust community engagement, the DAO-CB can thrive as a decentralized financial institution that is inclusive, resilient, and capable of transforming the future of banking. Through proactive mitigation strategies and constant innovation, this model can evolve to meet the demands of a complex and ever-changing financial landscape while staying true to its foundational principles of decentralization and community empowerment.

2.7 Case Scenarios and Use Cases

The application of Decentralized Autonomous Organizations (DAOs) in community-owned banking

introduces powerful new models for delivering inclusive, accessible, and democratic financial services. The DAO-based Community Bank (DAO-CB) offers solutions that are particularly impactful for underserved and unbanked populations, where traditional financial institutions have failed to provide affordable, transparent, or relevant services. By leveraging blockchain technology and smart contracts, DAO-CBs enable communities to create their own self-governing financial ecosystems that function without intermediaries, facilitate cooperative investments, and even extend across geographic boundaries to link diaspora members with their regions of origin (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). These use cases demonstrate the transformative potential of DAOs to build more equitable and community-oriented financial systems.

One of the most compelling scenarios for implementing DAO-based community banking is in underserved or unbanked regions, particularly in developing countries or marginalized communities within developed economies. In many of these areas, residents lack access to formal banking due to factors such as geographic isolation, lack of legal documentation, low income levels, or discriminatory practices (Ajayi, *et al.*, 2023, Farooq, Abbey & Onukwulu, 2024). Traditional banks often find it unprofitable to operate in these regions due to high overhead costs and low returns, leaving millions of people reliant on informal financial systems that are vulnerable to exploitation and lack regulatory oversight. DAO-CBs present an opportunity to leapfrog these traditional systems by offering decentralized financial services that require only a mobile device and internet connection.

Using DAO-CBs, individuals in these communities can participate in financial activities such as saving, lending, and investing with full transparency and minimal fees. A local cooperative or village council can initiate a DAO-CB by issuing governance tokens to community members, each of whom can contribute resources, vote on proposals, and access credit. Smart contracts automate loan approvals based on collectively defined criteria—such as community reputation, prior contributions, or verified income—thus replacing biased or inefficient credit scoring models (Aminu, *et al.*, 2024). Additionally, the transparent nature of blockchain ensures that all transactions and decisions are visible to the community, reducing opportunities for corruption or mismanagement. Educational initiatives and user-friendly interfaces tailored to local languages and cultural norms are essential components in ensuring inclusivity and engagement. In this way, DAO-CBs empower underserved populations to take control of their financial destinies while fostering local economic development.

Another vital application of DAO-CBs is as a platform for cooperative investment and microfinance. In both rural and urban areas, individuals and small businesses often struggle to access capital due to rigid collateral requirements or lack of formal financial records. Cooperative investment has traditionally served as a means for communities to pool resources for common goals, such as buying equipment, funding agricultural ventures, or starting local enterprises. DAO-CBs can digitize and scale this cooperative model through tokenized participation and smart contract automation (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). Members can contribute digital assets into a shared liquidity pool, which serves as the community's investment

fund. They can then collectively decide—through on-chain governance—how to allocate these resources, whether it be for issuing microloans, funding community infrastructure projects, or investing in regional economic opportunities.

This model is particularly effective in supporting women-led initiatives, informal sector entrepreneurs, and smallholder farmers, who are often overlooked by mainstream financial institutions. DAO-CBs enable the formation of financial circles with enforceable terms and automated repayment schedules, removing the need for physical meetings and reducing default risk. Because decisions are made democratically and transparently, the community maintains a strong sense of ownership and accountability. Returns from successful investments can be reinvested or distributed proportionally to members, creating a cycle of wealth generation and empowerment (Al-Amin, *et al.*, 2024, Folorunso, *et al.*, 2024). Moreover, because DAO-CBs operate on open protocols, they can integrate with other decentralized finance (DeFi) platforms to access broader liquidity, diversify investment opportunities, or hedge against local economic volatility. This opens new avenues for microfinance institutions, NGOs, and social impact investors to partner with DAO-CBs in scaling financial access and resilience.

In addition to local applications, DAO-CBs can also play a transformative role in enabling regional and diaspora-led community banking. Diaspora communities often face barriers in supporting their countries or regions of origin through traditional financial channels. Issues such as high remittance fees, lack of transparency in fund utilization, and bureaucratic delays hinder effective cross-border support. DAO-CBs provide a decentralized mechanism for diaspora members to contribute to local development in a structured, accountable, and participatory way (Akhigbe, *et al.*, 2021, Farooq, Abbey & Onukwulu, 2023). For example, a community from a particular town or ethnic group can establish a DAO-CB that includes both local residents and diaspora members as stakeholders. The DAO can issue tokens representing membership or contribution shares, enabling diaspora participants to directly fund projects such as schools, health clinics, renewable energy installations, or small businesses.

Governance tokens allow diaspora contributors to vote on how funds are used, ensuring alignment with community priorities and increasing transparency. Smart contracts manage the disbursement of funds and the monitoring of project milestones, ensuring that resources are used efficiently and as intended. The DAO-CB model thus transforms passive donations or remittances into active investments in community development. It also builds long-term relationships between diaspora members and their regions of origin, fostering social cohesion and cultural continuity (Ajiga, *et al.*, 2024, Durojaiye, Ewim & Igwe, 2024). Moreover, such cross-border financial ecosystems are immune to political interference or corruption, as they operate on open-source, trustless protocols governed by community consensus.

The regional applicability of DAO-CBs extends to municipalities and local governments seeking innovative models for participatory budgeting and community finance. For example, a city council can implement a DAO-CB to manage discretionary funds for local projects. Citizens receive tokens representing their stake in the community's financial future and can propose and vote on how to use the

funds—whether for road repairs, education initiatives, public art, or community gardens. This model not only enhances transparency and accountability in public finance but also deepens civic engagement and democratizes resource allocation (Ajayi, *et al.*, 2024). Furthermore, public-private partnerships can be facilitated through DAO-CBs, where local businesses contribute to a shared fund and receive governance rights, thereby aligning business interests with community development goals.

Importantly, DAO-CBs are designed to be adaptable across different scales and contexts. A village cooperative in Sub-Saharan Africa, an urban neighborhood in the United States, a fishing community in Southeast Asia, or a global diaspora from the Caribbean can all deploy customized DAO-CBs that reflect their unique values, needs, and economic conditions. The underlying blockchain infrastructure ensures that these entities remain interoperable, enabling collaboration, resource-sharing, and mutual support (Agho, *et al.*, 2021, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024). Over time, a network of DAO-CBs could emerge, creating a global movement of decentralized, community-driven finance. These networks could share best practices, pool liquidity, and coordinate large-scale initiatives such as climate resilience, pandemic response, or education access—entirely outside the constraints of traditional financial institutions.

In conclusion, the case scenarios and use cases of DAO-CBs reveal a powerful vision for decentralized, inclusive, and community-driven financial systems. Whether addressing the financial exclusion of underserved communities, facilitating cooperative investment and microfinance, or empowering diaspora populations to participate in local development, DAO-CBs offer flexible, transparent, and democratic alternatives to conventional banking. They transform users from passive recipients of financial services into active co-creators of their own economic ecosystems (Chukwuma-Eke, Ogunsola & Isibor, 2021). As blockchain adoption spreads and digital literacy improves, DAO-CBs are poised to become a cornerstone of financial empowerment, social innovation, and economic justice in the 21st century.

2.8 Policy and Research Implications

The rise of Decentralized Autonomous Organizations (DAOs) as a conceptual model for community-owned banking and financial governance presents significant implications for policy formulation and academic research. At the heart of this emerging paradigm lies a transformative vision of financial democratization, where power, control, and access are distributed across communities rather than concentrated in institutions. As DAOs challenge the traditional norms of banking, finance, and governance, their growing adoption necessitates a nuanced understanding of their potential, limitations, and socio-economic impacts (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2024, Igwe, *et al.*, 2024). The evolving DAO model holds the promise of reshaping financial ecosystems, but realizing this potential will depend heavily on responsive policymaking and robust, interdisciplinary research.

DAOs fundamentally alter the architecture of financial systems by eliminating centralized intermediaries and enabling communities to govern their own financial infrastructure through transparent, programmable, and inclusive mechanisms. This shift promotes financial

democratization by allowing individuals—especially those traditionally excluded from mainstream finance—to actively participate in economic decision-making. In contrast to conventional banking systems, which often rely on opaque processes and hierarchical governance structures, DAOs operate with open-source code and token-based voting systems that offer a direct line between stakeholders and institutional decisions (Alabi, *et al.*, 2024, Egbuhuzor, 2024, Fredson, *et al.*, 2024). In doing so, they provide a means for historically marginalized groups to gain financial agency, enabling users not only to access services like lending, saving, and investing but also to co-govern those services according to their collective values and needs.

The implications of this shift are profound. Communities that lack banking infrastructure or suffer from mistrust in public institutions can use DAOs to build self-reliant financial systems rooted in transparency and accountability. By removing the need for third-party verification, DAOs reduce transaction costs and increase the efficiency of resource allocation. Furthermore, DAOs inherently foster civic engagement, as they depend on community participation to function. This model also introduces new forms of economic identity, wherein individuals gain reputational capital through their contributions to the community bank, rather than relying solely on credit scores or formal documentation (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2022). As such, DAOs expand the definition of financial inclusion beyond access to services—it becomes a question of participatory ownership and governance.

For policymakers, this emerging financial infrastructure presents both opportunities and challenges. On one hand, DAO-based systems can support national goals around financial inclusion, digital transformation, and innovation. On the other hand, they also pose regulatory dilemmas that must be addressed thoughtfully to protect consumers, ensure systemic stability, and prevent misuse. One of the immediate challenges is legal recognition (Ajiga, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2022). Most jurisdictions do not have clear frameworks that recognize DAOs as legal entities, which complicates everything from liability assignment to contractual enforcement. Without legal personhood, DAOs cannot easily interact with traditional institutions, obtain licenses, or be held accountable in court.

To address these challenges, policymakers should consider the development of DAO-specific legal classifications, similar to what has been introduced in Wyoming, USA, where DAOs can register as Limited Liability Companies (LLCs). This legal recognition offers a pathway for DAOs to operate within regulated frameworks while maintaining their decentralized character. Policymakers should also adopt a sandbox approach—creating controlled environments where DAOs can operate under reduced regulatory pressure while being monitored and evaluated (Ayanponle, *et al.*, 2024, Egbuhuzor, *et al.*, 2021, Igwe, Eyo-Udo & Stephen, 2024). This would allow regulators to study DAO operations in practice, identify risks, and craft informed policies that balance innovation with oversight.

Another key recommendation is the integration of flexible, scalable KYC (Know Your Customer) and AML (Anti-Money Laundering) guidelines tailored to the decentralized model. Rather than imposing centralized compliance requirements that would undermine the very ethos of DAOs, governments can encourage the use of decentralized identity

systems, cryptographic proofs, and zero-knowledge protocols to achieve compliance without compromising user privacy (Akintobi, Okeke & Ajani, 2022, Elufioye, *et al.*, 2024). Public-private partnerships between regulators, DAO developers, and civil society organizations can foster dialogue and co-design inclusive policies that ensure regulatory alignment while safeguarding innovation.

From the perspective of developers, the DAO ecosystem must be designed with accessibility, security, and adaptability in mind. It is essential to prioritize user experience and educational support to reduce entry barriers for non-technical users. Developers should focus on building modular, interoperable systems that can evolve in response to community feedback and technological advances (Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). Governance mechanisms must be designed to prevent token hoarding, voting manipulation, and the exclusion of minority voices. Introducing reputation-weighted voting, delegation models, and periodic audits can enhance the resilience and legitimacy of DAO governance. Moreover, developers must collaborate with legal and financial experts to ensure that DAO platforms comply with emerging policies and global standards while retaining their decentralization and autonomy.

Academic researchers also play a vital role in supporting the DAO movement. Future research should adopt an interdisciplinary lens, combining insights from economics, political science, law, computer science, and sociology. One key research area involves evaluating the socio-economic impact of DAO-based banking in low-income or marginalized communities. How do DAO-CBs (Community Banks) affect income distribution, access to capital, or entrepreneurial activity in different contexts? Are there measurable improvements in financial literacy, empowerment, or community trust? These questions require both quantitative analysis and qualitative fieldwork to understand not just the outcomes but the lived experiences of DAO participants (Egbuhuzor, *et al.*, 2022, Igwe, *et al.*, 2024).

Another important research direction involves studying the governance dynamics within DAOs. While token-based voting is the predominant model, it may not be optimal for all contexts. Researchers can explore alternative models such as quadratic voting, conviction voting, or holacratic structures to assess their effectiveness in different community sizes and cultural contexts. Additionally, longitudinal studies are needed to examine the sustainability of DAO governance over time. How does participation evolve? What factors contribute to voter engagement or apathy? How do DAOs adapt to crises, conflicts, or leadership vacuums?

Security is another critical area for scholarly attention. Despite their promise, DAOs remain vulnerable to coding errors, governance attacks, and malicious manipulation. Researchers should work alongside developers to advance the formal verification of smart contracts, the use of machine learning for anomaly detection, and the development of decentralized insurance protocols to mitigate risk (Ajayi, *et al.*, 2024, Bristol-Alagbariya, Ayanponle & Ogedengbe, 2023). Ethical considerations must also be explored—what responsibilities do DAO creators have toward their communities? How can values such as equity, transparency, and inclusivity be encoded into governance systems?

Lastly, there is a need for comparative policy research that examines how different countries are approaching DAO regulation. Such studies can identify best practices, regulatory blind spots, and pathways for international harmonization. By creating a global repository of DAO case studies, scholars and practitioners can learn from both successful implementations and failed experiments, refining models for greater impact and resilience.

In conclusion, the policy and research implications of DAO-based community banking are far-reaching and urgent. DAOs hold the potential to redefine financial access, governance, and community empowerment in ways that centralized systems cannot. However, unlocking this potential requires coordinated action from developers, policymakers, researchers, and communities themselves (Ajiga, *et al.*, 2024, Chukwuma-Eke, Ogunsola & Isibor, 2022). Thoughtful regulation, inclusive design, and evidence-based research must go hand-in-hand to build DAO ecosystems that are secure, scalable, and socially transformative. As the world continues to grapple with questions of inequality, institutional trust, and economic decentralization, DAO-CBs represent not only a technical innovation but a paradigm shift in how we imagine and manage the future of finance.

2.9 Conclusion

Decentralized Autonomous Organizations (DAOs) represent a radical departure from traditional models of financial governance, offering a transparent, participatory, and technology-driven approach to building inclusive and community-owned financial systems. By leveraging blockchain infrastructure, smart contracts, and token-based governance, DAOs eliminate the need for centralized intermediaries and place decision-making power directly in the hands of stakeholders. This conceptual model for community-owned banking integrates decentralized finance principles with grassroots ownership, enabling individuals and communities—particularly those historically marginalized or underserved—to access, manage, and govern their own financial institutions with autonomy and accountability.

Throughout the proposed framework, several key insights emerge. First, the DAO model enhances financial inclusion not only by providing access to basic financial services but by empowering communities to co-design and co-govern those services. It transforms users into active participants, redistributing authority and aligning financial operations with the specific needs and values of the community. Second, the functional design—based on smart contract automation, decentralized liquidity pools, and democratic voting mechanisms—offers robust safeguards against corruption, inefficiency, and systemic failure. Third, the model's flexibility allows for broad application: From unbanked rural villages and urban cooperatives to diaspora-led development initiatives and municipal participatory budgeting. Finally, the integration of legal, technical, and community strategies in the implementation roadmap highlights the feasibility and scalability of DAO-based community banks.

Looking ahead, the future of community-owned financial systems through DAOs appears both promising and transformative. As blockchain adoption expands and regulatory clarity improves, DAO-CBs have the potential to become foundational pillars of a new financial era—one

defined not by centralized control or profit maximization but by inclusivity, transparency, and collective stewardship. These systems will not merely supplement existing banks; they will reimagine what financial institutions can be, embedding democratic governance, technological trust, and community resilience at their core. With sustained policy support, developer innovation, and interdisciplinary research, DAOs can usher in a future where finance is no longer exclusive or opaque, but decentralized, equitable, and profoundly human-centered.

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