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Leveraging "Decentralized Autonomous Organization" in the Tourism Industry: An Empirical Itinerary Startup Study

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Summary

Abstract

Over the past decade, the emergence of innovative technologies has reshaped organizational structures, expanding the boundaries of traditional models. Among these advancements, DAO's have gained prominence as a disruptive and transformative approach to governance and collaboration.

Decentralized Autonomous Organizations (DAOs) represent a revolutionary model of governance and financing enabled by blockchain technology. These organizations operate without centralized leadership, relying instead on smart contracts that autonomously execute pre-defined rules. DAOs foster global collaboration, enabling communities to self-organize around common goals with transparency, inclusivity, and efficiency. Despite their growing adoption, the academic and professional understanding of DAO governance structures, economic impact, and scalability remains underdeveloped. This thesis aims to bridge this gap by analyzing the evolution of DAO ecosystems and evaluating their potential to create self-sustaining, participatory communities.

The research investigates both theoretical and practical dimensions of DAOs, examining key success and failure factors in governance, financial stability, and community engagement. It highlights how DAOs address the inefficiencies of traditional organizational models, particularly in areas such as fundraising and resource allocation, by implementing mechanisms that promote decentralized decision-making and stakeholder alignment.

A specific application of these findings is explored through a case study involving a DAO-driven platform for travel bloggers and digital nomads. This platform aims to facilitate the creation and sharing of personalized travel itineraries, leveraging a decentralized governance system to engage users as active contributors and decision-makers. Through the issuance of governance tokens, participants are empowered to propose and vote on strategic initiatives, thereby reinforcing a model of collective ownership and responsibility.

This thesis contributes to the growing body of literature on DAOs by providing a comprehensive framework for understanding their organizational dynamics and practical applications. It demonstrates how DAOs can enhance both economic sustainability and social cohesion in digital ecosystems, offering valuable insights for future research and development in decentralized governance and platform-based business models.

CHAPTER 1. Theoretical background of the DAOs model.

1.1 Introduction to the DAOs

1.1.1 Definition and views from literature

The concept of Decentralized Autonomous Organizations (DAOs) represents a significant innovation in governance and organizational theory. A DAO is defined as a blockchain-based organization where governance is managed by smart contracts—self-executing pieces of code that automatically enforce pre-defined rules—thus enabling even a 'witch' to work out thanks to blockchain [1]. Unlike traditional organizations that rely on hierarchical structures, DAOs operate in a peer-to-peer, decentralized manner, enabling global communities to collaborate without the need for centralized leadership.

This separation between administrative and commercial management, on the one hand, and ownership, on the other, is facilitated by "Utility Tokens," a specific category of tokens granting access to specialized services or functionalities within a blockchain platform.

Before proceeding with the analysis, it is useful to clarify the concept of this specific organizational and fundraising model by deconstructing the acronym "*DAO*" .

Decentralized : recent analyses, emphasize that "decentralization" within a DAO implies the distribution of governance power and operational authority among token holders or stakeholders. Instead of relying on a hierarchical command structure, DAOs utilize token-based voting or other consensus mechanisms to guide strategic decisions. [2]

For instance, in the MakerDAO case, examined in the literature, thousands of distributed participants collectively decide on parameters such as lending rates or collateral types.

[1] Hassan, S., & De Filippi, P. (2021). *Decentralized Autonomous Organization*. Internet Policy Review, 10(2).

[2] Dwivedi, V., Norta, A., Wulf, A., Leiding, B., Saxena, S., & Udokwu, C. (2021). A Formal Specification Smart-Contract Language for Legally Binding Decentralized Autonomous Organizations. *IEEE Access, 9*, 76069–76082

This dispersion of power can foster a more transparent, inclusive environment while mitigating the risks commonly associated with a single, centralized authority. [3]

Autonomous : autonomy within DAOs is enabled by self-executing smart contracts that enforce rules and procedures automatically, requiring minimal human oversight. These smart contracts codify everything from treasury management to the steps involved in proposal evaluation, effectively reducing administrative overhead and the likelihood of human error or manipulation. [4]

In the literature is highlighted that, in many DAOs, on-chain governance mechanisms are complemented by off-chain discussions—often in dedicated forums or communication channels—so that the final, on-chain execution remains both automatic and tamper-resistant. This blend of automation and open dialogue can improve accountability while streamlining essential processes [5].

Organization: despite their decentralized and autonomous underpinnings, DAOs are still recognizable as "organizations," insofar as they unite a network of participants around shared objectives. Whether it is issuing governance tokens, establishing funding pools, or orchestrating community proposals, a DAO maintains operational coherence akin to a traditional enterprise—yet without centralized management.[6]

DAOs have proven particularly appealing for fundraising, allowing global participants to pool resources in exchange for governance rights or utility tokens, thereby supporting projects ranging from DeFi (Decentralized Finance) platforms to non-profit endeavors. This organizational dimension ensures that DAOs are not merely loose collectives, but structured entities driven by common interests and goals.

[3] Ellinger, W. E., Mini, T., Gregory, R. W., & Dietz, A. (2024). Decentralized Autonomous Organization (DAO): The case of MakerDAO. *Journal of Information Technology Teaching Cases, 14*(2), 265–272

[4] Ding, W., Liang, X., Hou, J., Li, J., Rouabah, Y., Yuan, Y., & Wang, F. Y. (2023). A novel approach for predictable governance of decentralized autonomous organizations based on parallel intelligence. *IEEE Transactions on Systems, Man, and Cybernetics: Systems, 53*(5), 3092–3103.

[5] Saito, Y., & Rose, J. A. (2023). Reputation-based Decentralized Autonomous Organization for the non-profit sector: Leveraging blockchain to enhance good governance. *Frontiers in Blockchain, 5*.

[6] Faqir-Rhazoui, Y., Arroyo, J., & Hassan, S. (2021). A comparative analysis of the platforms for decentralized autonomous organizations in the Ethereum blockchain. Journal of Internet Services and Applications, 12(1)

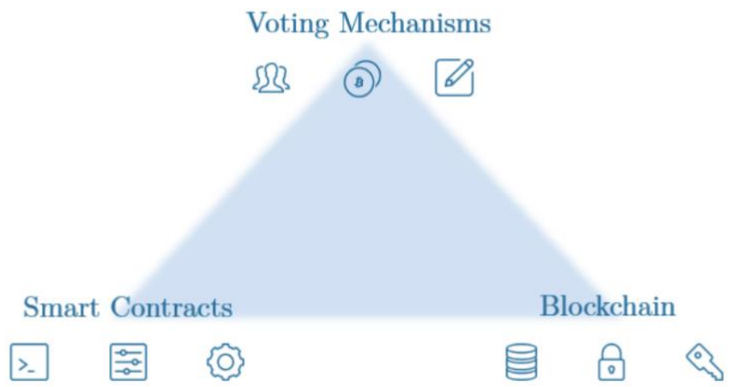


Figure 1.1 : Triangle-like structure of a DAO

The *figure 1.1* illustrates a dynamic interplay between voting mechanisms, smart contracts, and the blockchain, forming an integrated cycle of decentralized governance.

Initially, stakeholders submit proposals, which are encoded within the system as potential changes or actions. These proposals then enter the voting phase, where community members cast their votes—each vote being recorded in real time.

As votes accumulate, smart contracts, already embedded with the rules governing the decision-making process, actively monitor the tally. Once a predetermined threshold or consensus is reached, these smart contracts are automatically triggered to execute the approved proposal. This execution might involve actions such as reallocating funds, updating system parameters, or enacting new governance policies. The resulting state change is immutably recorded on the blockchain, ensuring that every decision and its outcome remain transparent and verifiable over time.

In essence, this cycle—where proposals lead to votes, votes trigger automated execution, and the outcomes are permanently archived—creates a self-regulating, feedback-driven system that exemplifies the core operational dynamics of a DAO.

1.1.2 Legal and regulatory framework

In the current normative context, Decentralized Autonomous Organizations (DAOs) present unique legal challenges and opportunities. Their inherently decentralized and autonomous nature challenges traditional legal frameworks that require a central, identifiable entity to assume liability. For example, note that the absence of a centralized

hierarchical structure complicates the attribution of legal personality to a DAO, thereby raising significant questions regarding liability in cases of malfunction or dispute.

In response to these challenges, some jurisdictions have begun integrating DAOs into the traditional legal system. A notable example is the State of Wyoming, which has enacted legislation permitting DAOs to register as legal entities.

As analyzed by the studious Riva this legislative intervention aims to establish a clear regulatory framework that ensures operator accountability and investor protection while preserving the benefits of decentralization[7]. The Wyoming DAO Act, as discussed in legislative commentaries (Wyoming Legislature, 2020), provides an instructive model for reconciling innovative decentralized structures with established legal norms.

Another critical aspect involves the management and classification of tokens issued by DAOs. In this context, a distinction is made between "Utility Tokens," which grant access to specific services or functionalities within a blockchain platform, and "Security Tokens," which possess investment characteristics and therefore require stricter regulation akin to traditional securities. The literature emphasize that this distinction necessitates the development of dedicated regulations to govern token issuance and circulation, thereby mitigating fraud risks and enhancing investor protection. Complementing this perspective, "rethinking token classification is essential for harmonizing decentralized financial mechanisms with existing regulatory frameworks" [8].

Furthermore, the rapid evolution of blockchain technology and the increasing adoption of DAOs are prompting a radical rethinking of conventional corporate law. In the Literature emerges that the digital transformation of organizations necessitates a reassessment of traditional legal models to embrace hybrid solutions—ones that integrate the benefits of decentralization, such as transparency, operational efficiency, and reduced administrative costs, with the need for legal stability and accountability. Additional

[7] Riva, S. (2019). *Decentralized Autonomous Organizations (DAOs) as Subjects of Law–the Recognition of DAOs in the Swiss Legal Order* [Master's thesis]

[8] De Filippi, P., & Wright, A. (2018). *Blockchain and the law: The rule of code.* Harvard University Press.

analyses highlight that a reexamination of legal accountability is required, especially regarding the responsibilities of token holders and the creators of smart contracts.

In summary, the current regulatory landscape for DAOs is characterized by a dynamic dialogue among academics, practitioners, and policymakers. As jurisdictions like Wyoming pioneer new legal frameworks and scholars advocate for hybrid models that balance innovation with accountability, the integration of DAOs into the global legal system emerges as both a technological imperative and a normative challenge. This evolving discourse is vital to fully harness the potential of decentralized organizational models while safeguarding investor interests and ensuring legal compliance.

1.2 The Historical Evolution of DAOs

The DAO is a software application first introduced in 2014 by Vitalik Buterin, the creator of Ethereum. Ethereum emerged as the first public blockchain platform to support smart contracts through its Turing-complete virtual machine, the EVM. This breakthrough paved the way for the idea of encoding an organization's management and operational rules directly onto the blockchain via smart contracts, thereby enabling autonomous operation based on predetermined business logic without relying on third-party intermediaries.

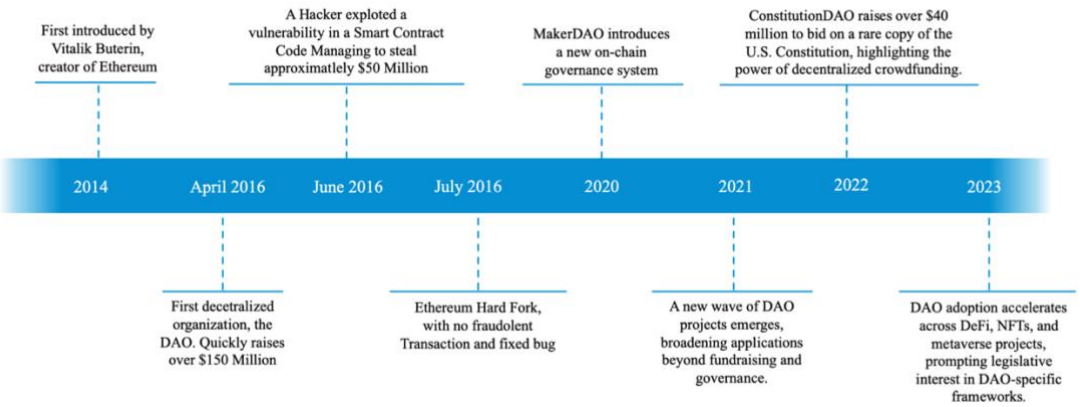


Figure 1.2 : Historical map of DAOs

In April 2016, two years after its initial conceptualization, The DAO was launched as the first decentralized organization. Although Ethereum is widely regarded as the pioneer in the development of DAO networks, other blockchain platforms—such as Polygon, Solana, Substrate, and Cardano—have since adopted DAO implementations. Within a short span, The DAO managed to raise over $150 million worth of ETH, marking it as the largest fundraising project of its time and setting a benchmark for subsequent initiatives.

However, a few months after its launch, a significant vulnerability in one of The DAO's smart contracts was exploited by an attacker. This vulnerability, stemming from a flawed function within the contract's code, allowed the attacker to siphon off approximately 3.6 million ETH—valued at around $50 million at the time—which led to a dramatic decline in the token's price and overall losses estimated at about $70 million. In response, Ethereum's founder initially proposed a soft fork—a software modification aimed at freezing the movement of the stolen funds and enabling investors to reclaim their assets. This proposal ignited intense debates regarding the morality and philosophy underlying such unilateral changes to the blockchain's immutable history, raising concerns about censorship resistance and the true extent of control within decentralized systems.

Ultimately, the community largely supported a more radical solution—a hard fork—which resulted in the creation of a parallel blockchain where the attack was effectively nullified, and the vulnerability was remedied.

This incident proved to be a watershed moment in the evolution of DAOs, simultaneously demonstrating the potential and the pitfalls of decentralized governance. Notably, the attacker defended his actions by claiming they were executed in full compliance with the smart contract's terms and, by extension, in accordance with U.S. legislation. This assertion underscored a critical debate: whether exploiting a loophole in the contract's code constitutes the rightful exercise of one's contractual rights or an unethical breach of trust. The episode thus raised profound questions about accountability, reliability, and the ethical dimensions of autonomous systems—issues that continue to influence scholarly and regulatory discussions.

Following this turbulent period, interest in DAOs gradually re-emerged. In 2018, the MakerDAO stablecoin protocol introduced an innovative on-chain governance system, establishing itself as one of the pioneering applications of blockchain-based organization. Then, in 2020, a new wave of DAOs began to surface, leading to an increasing adoption

of on-chain governance models across various sectors, particularly within the decentralized finance ecosystem. Subsequent chapters will further examine examples of successful DAOs and their diverse applications, offering deeper insights into both the operational dynamics and the broader implications of this revolutionary organizational model.

Since then, the DAO ecosystem has expanded rapidly. In 2020 and beyond, a new wave of DAOs emerged, spanning a diverse range of applications—from decentralized finance (DeFi) and venture capital to creative industries and community-based projects. Projects like Aragon, Colony, and MolochDAO have further refined the model, each contributing unique approaches to governance and operational design. These platforms have explored various voting mechanisms and incentive structures to balance decentralized decision-making with effective management, addressing issues such as token liquidity, participant engagement, and the inherent challenges of scaling global communities.

Simultaneously, the regulatory landscape has begun to adapt to these innovations. Jurisdictions such as Wyoming, Malta, and Switzerland have introduced legislation or guidelines specifically aimed at accommodating the unique structures of DAOs. These regulatory efforts aim to provide clearer definitions of legal personality, establish frameworks for investor protection, and set boundaries that can help prevent misuse while still fostering innovation. Such initiatives are critical, as they seek to reconcile the radical decentralization inherent in DAOs with the accountability and transparency demanded by traditional legal systems.

Today, DAOs represent an ongoing experiment in reimagining organizational governance and capital formation in the digital age. The evolution from The DAO to MakerDAO and beyond reflects not only the transformative potential of decentralized technologies but also the complex interplay between technological innovation, community engagement, and regulatory adaptation. As the ecosystem matures, researchers and practitioners continue to explore hybrid governance models that integrate on-chain automation with off-chain deliberation, striving to harness the benefits of decentralization while mitigating its challenges. This dynamic evolution underscores the promise of DAOs to fundamentally alter how organizations are structured and financed, paving the way for a more inclusive and transparent economic future.

1.3 Technological Underpinnings of DAOs

Decentralized Autonomous Organizations (DAOs) rely fundamentally on two key technologies: blockchain and smart contracts. Together, these innovations create a framework that enables organizations to operate in a decentralized, transparent, and autonomous manner.

At its core, blockchain is a distributed ledger technology that securely records transactions across a network of nodes. Unlike traditional centralized databases, a blockchain does not rely on a single point of control. Instead, every transaction is verified by multiple participants and permanently stored in a series of linked blocks. This immutable record ensures that all actions within the network are transparent and tamper-resistant, fostering trust among stakeholders who might not have any preexisting relationship.

Complementing blockchain, smart contracts are self-executing pieces of code that reside on the blockchain and automatically enforce predetermined rules. Once the conditions defined within a smart contract are met, the contract executes the corresponding actions—be it transferring funds, updating records, or triggering other operational processes—without the need for manual intervention. This automation not only reduces the potential for human error but also eliminates the need for intermediaries, thereby streamlining processes and lowering transaction costs.

The synergy between blockchain and smart contracts is what underpins the operational framework of DAOs. Blockchain provides the secure, decentralized infrastructure that records every transaction and decision, while smart contracts ensure that the organizational rules are executed consistently and without bias. This combination creates a trustless system where governance decisions, such as voting on proposals or allocating resources, are executed automatically, and every action is verifiable by any member of the network.

Moreover, this technological foundation enables DAOs to implement innovative governance models. For example, through on-chain voting mechanisms, stakeholders can propose changes and vote on initiatives, with the outcome automatically enforced by smart contracts. This approach not only democratizes decision-making but also establishes a continuous feedback loop, where past decisions inform future governance, enhancing both accountability and operational efficiency.

In summary, blockchain and smart contracts are the twin pillars supporting the functionality of DAOs. They provide a secure, transparent, and automated environment in which decentralized organizations can operate independently of traditional centralized structures, paving the way for new models of collective governance and financial innovation in the digital age.

1.3.1 The Blockchain

Blockchain can be characterized as a distributed database technology, also known as Distributed Ledger Technology (DLT), that cannot be altered by individual users or groups. More specifically, DLT allows transactions and data to be recorded in a decentralized manner across a network of nodes, thereby eliminating the need for a central authority to manage the ledger.

In a typical DLT system, four operations are possible: Create, Retrieve, Update, and Delete. However, blockchain represents a particular kind of DLT that permits only two operations: Create and Retrieve. Once data is recorded on the blockchain, it cannot be modified or erased.

The structure of this technology is organized into blocks. Each block consists of a series of transactions, a timestamp, and a hash function that links it to the previous block, all the way back to the original genesis block. New blocks are added to the chain through the efforts of miners and are validated via a consensus protocol, which will be discussed later. This design ensures that every node in the network holds a complete copy of the ledger, enhancing both decentralization and reliability.

To further elucidate the blockchain structure, consider the concept of a Merkle tree. In a Merkle tree, transactions undergo a hashing process, are paired together, and then hashed repeatedly until only a single hash remains—known as the Merkle root. Each subsequent block stores the Merkle root of the previous block, thereby forming a cryptographically secure, interconnected chain of data.

The *Figure 1.3* below illustrate this kind of structure.

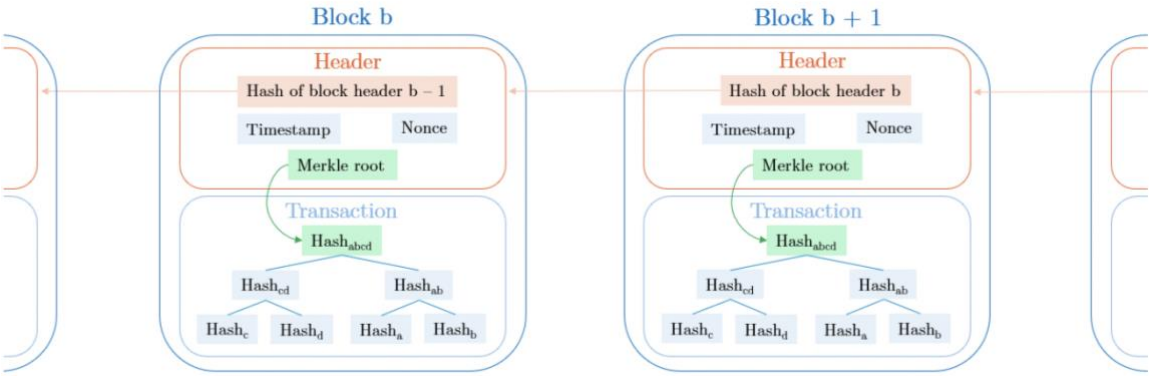


Figure 1.3 : Blockchain's structure

In this architecture, three additional technical elements prove essential; without them, the blockchain could not function as the transparent and secure system it is [9].

Hash functions: A hash function is a mathematical tool that converts data of any size into a fixed-length string, often referred to as a hash value. One of its key properties is pre-image resistance, which means that, given a hash output, it is computationally unfeasible to reconstruct the original input. Additionally, it is extremely unlikely to find two different inputs that produce the same hash value. In practical terms, this feature ensures the integrity of data in a blockchain; once information is added to a block, any alteration would result in a different hash. This change would break the links between blocks, alerting the network to the tampering and preserving the security and reliability of the entire ledger.

Public Key Cryptography: Public key cryptography underpins the security of transactions in a blockchain. Each user possesses a pair of keys: a private key, which is kept secure in a digital wallet or specialized hardware, and a public key, which is openly shared. The private key is used to sign transactions, producing a unique digital signature. This signature, along with the transaction details, is broadcast to the network. Miners or

[9] Guo, H., & Yu, X. (2022). A survey on blockchain technology and its security. *Blockchain: Research and Applications, 3*(2), 100067.

validators then use the sender's public key to verify the digital signature by comparing the hash of the transaction data with the one produced by the signature verification process. Since only the holder of the private key can create a matching signature, this mechanism provides a robust method to confirm the authenticity of transactions without exposing sensitive information.

Zero-Knowledge Proofs: Zero-Knowledge Proofs (ZKPs) are advanced cryptographic techniques that allow one party to prove to another that a statement is true without revealing any details beyond the validity of the assertion itself. In the context of blockchain, ZKPs are particularly valuable for preserving user privacy. For instance, when validating financial transactions, a blockchain network can confirm that a transaction meets all necessary conditions (such as sufficient balance) without knowing the exact amount involved or the identities of the parties. This ensures that while the network maintains trust and security, the sensitive financial and personal details of users remain confidential.

Together, these three technologies—hash functions, public key cryptography, and zero-knowledge proofs—form the technical backbone of blockchain systems. They work in tandem to secure data, validate transactions, and protect user privacy, thereby enabling decentralized systems like DAOs to operate reliably and transparently in an environment where trust is established not through central authorities, but through robust, self-enforcing cryptographic principles.

This technology therefore enables direct, efficient, and effective peer-to-peer (P2P) transactions among network nodes, removing the need for intermediaries and safeguarding the integrity and security of the entire chain of blocks. By leveraging advanced cryptographic algorithms, each transaction is recorded in a permanent and verifiable manner, ensuring that data cannot be altered or manipulated without consent, and thereby strengthening trust among all network participants.

1.3.2 Blockchain Consensus Protocols

A critical challenge for any blockchain is establishing a robust consensus process for appending new blocks to the shared ledger. Owing to its decentralized design and the inherent properties of its hash-based structure, any transaction that has been recorded is exceedingly difficult to alter maliciously. The real difficulty lies in validating and incorporating new blocks into the chain.

This procedure is vital to preserving both the integrity and the security of the transactions logged on the blockchain. Should a nefarious actor manage to insert fraudulent transactions, the system's overall reliability and usefulness would be significantly undermined. Furthermore, the inherent anonymity offered by blockchain networks raises additional concerns regarding the trustworthiness and overall integrity of transactions. Consequently, it is imperative that every transaction undergoes rigorous validation by network participants via consensus protocols. These protocols consist of sophisticated algorithms that enable unknown and potentially untrusted parties to collectively determine which blocks should be accepted as valid. In essence, consensus algorithms establish a uniform set of rules that all nodes in the network must follow, capitalizing on the shared interests of participants to sustain a transparent and reliable ledger. This is especially crucial in a decentralized environment where no central authority is available to arbitrate disputes or verify transactions. Additionally, consensus protocols must meet several criteria, such as ensuring security, tolerating faults, optimizing energy consumption, and efficiently managing network delays. Various consensus mechanisms have been devised to tackle these challenges, thereby enabling blockchain networks to make dependable, distributed decisions.

Here we see the principals [1] :

Proof of Work: In a Proof of Work (PoW) system, participants known as miners must solve a computational puzzle. Specifically, miners search for a nonce—a random number—that, when combined with the block's data, produces a hash value meeting certain difficulty criteria (for example, starting with a predefined number of zeros). Because there is no shortcut to predict the correct nonce, miners must perform countless iterations of hash calculations until they find a valid solution. The miner who succeeds first propagates the new block to the network, where other nodes verify the solution by checking that the hash meets the required conditions. Once the block is accepted, the miner receives a reward, usually in the form of cryptocurrency. While PoW has proven

effective for maintaining network security and data integrity, it is also known for its high energy consumption, as the extensive computational effort demands significant power.

Proof of Stake: Proof of Stake (PoS) offers an alternative approach by shifting the focus from computational work to capital commitment. In PoS, network participants, called validators, lock up a certain amount of cryptocurrency as a stake. The selection of a validator to create a new block is based on the size of this stake rather than on raw computational power. When a validator is chosen, they verify the block and receive transaction fees as compensation. However, if a validator attempts to add an invalid block, they risk losing part of their staked funds. This mechanism reduces energy requirements while still incentivizing honest behavior through financial penalties and rewards.

Proof of Authority: Proof of Authority (PoA) relies on the reputation of a small group of pre-approved validators rather than on computational effort or staked capital. In PoA systems, validators must publicly reveal their identities and are selected based on their trustworthiness and track record. This model typically limits the number of validators, which enhances scalability and significantly reduces energy consumption. However, the trade-off is a decrease in decentralization; because a fixed group of known validators controls the process, the system can be more vulnerable to internal collusion or external influence if those validators are compromised.

Other consensus mechanisms, such as Proof of Burn (PoB), Proof of Importance (PoI), and Practical Byzantine Fault Tolerance (PBFT), also exist and address various trade-offs between security, efficiency, and decentralization. Regardless of the specific protocol, consensus mechanisms remain fundamental to blockchain technology because they enable a network of independent nodes to agree on transaction validity without central oversight, thus preserving the security, transparency, and integrity that are hallmarks of decentralized systems.

1.3.3 Smart Contracts

In this section, we introduce smart contracts—an essential component that drives automation within blockchain systems. To fully understand their importance, it is useful to consider Ethereum, a platform launched in 2014 by Vitalik Buterin. Ethereum represents more than just a new cryptocurrency; it marks a radical shift in the blockchain paradigm by providing a global, open-source platform that supports decentralized applications (dApps) through the execution of smart contracts. As the first blockchain to integrate a Turing-complete programming language, Ethereum enabled developers to create complex scripts capable of managing a wide variety of transactional logic.

At the heart of Ethereum's operation is the Ethereum Virtual Machine (EVM), a decentralized virtual environment that executes code across a network of public nodes. While Ethereum has its native cryptocurrency, Ether (ETH), its primary aim is to offer a decentralized framework for diverse applications. To prevent potential network congestion caused by infinite loops in smart contract execution, Ethereum introduced the concept of "gas." Each smart contract execution consumes a specified amount of gas, which must be purchased with ETH, and the maximum gas allocation is set within the contract itself. This mechanism ensures that computational resources are carefully managed and that no contract can monopolize network capacity.

Once deployed, smart contracts run on validator nodes, executing predetermined instructions automatically when specific conditions are met. Unlike traditional contracts, which require manual intervention for enforcement, smart contracts operate with precision and objectivity, reducing the need for intermediaries. They not only manage cryptocurrency transfers but can also handle a variety of transaction types, effectively codifying rules in a self-executing manner. This leads to enhanced security, faster processing times, and lower transaction costs compared to conventional contractual systems. However, despite their significant benefits in terms of efficiency and reliability, smart contracts still face unresolved legal challenges regarding their enforceability and the development of appropriate regulatory frameworks.

Overall, Ethereum's innovation in supporting smart contracts has demonstrated the potential to program blockchain networks for a vast array of transactional processes, laying the groundwork for more autonomous and efficient digital systems. This integration of automated code with decentralized technology has paved the way for applications that offer greater transparency and security than traditional systems, while

also presenting new challenges that continue to shape the evolution of blockchain governance.

1.4 DAO's technical characteristics

1.4.1 The phases of a DAO

Given that smart contracts are one of the fundamental pillars of decentralized organizations, DAOs inherently capture the principles of transparency, automation, and traceability throughout their lifecycle. Maxim Savalyev outlines four principal phases in the evolution of a DAO [10]:

In the *Pre-DAO phase*, the project is in its nascent stage. This phase involves the initial launch, where the foundational elements of the DAO are established through careful planning and community building. During this period, critical components such as the project's objectives, the governance model, the token economy, the selection of the technological platform, and the decision-making processes are designed and refined. These elements lay the groundwork for a robust and sustainable decentralized organization.

Following this, the DAO enters the *Flat DAO phase*. The term "flat" reflects the organizational structure at this stage, where all members operate on an equal footing without any hierarchical differentiation. In this environment, the most committed community members actively contribute to the DAO's functioning. However, as the community grows, the increasing complexity of interactions naturally gives rise to the need for a more structured form of organization. This leads to the formation of Sub-DAOs, which function as specialized internal departments designed to manage distinct aspects of the DAO's operations and facilitate smoother, more efficient collaboration.

[10] M. Savelyev. «Lifecycle and Structure of a DAO.» (2022), Link: https: //blog.dex.guru/DAO-Structure.

The third phase, simply referred to as the *DAO phase*, is characterized by the maturation of the organization. Here, the Sub-DAOs begin to operate more independently, effectively handling internal tasks and expanding their operational roles beyond the central framework. At this point, the DAO becomes a fully functional and autonomous entity, where the decentralized governance model is fully realized, and the organization can manage its affairs in a self-sustaining manner.

Finally, the *post-DAO* phase represents the stage where the organization has reached a stable and established state. In this phase, some Sub-DAOs may evolve to become completely independent from the main DAO, reflecting a further degree of specialization and autonomy. This evolution indicates that the DAO model is dynamic, capable of adapting over time to the needs and growth of its community while maintaining its core values of transparency and automated governance.

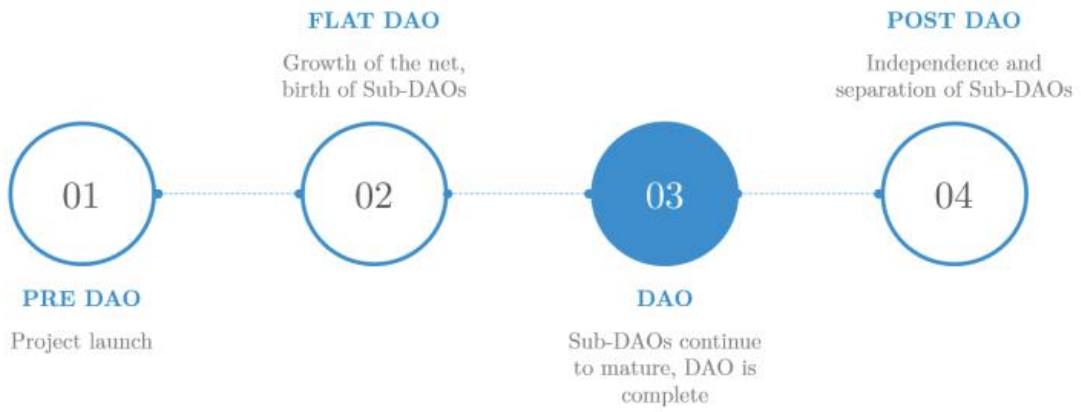


Figure 1.4 :DAO's lifecycle

1.4.2 Other Insights on DAOs

After providing this overview, we now outline additional fundamental characteristics of a DAO [11] [12] [13]:

- In a DAO, every transaction and decision is recorded with complete transparency and is immutable, fostering trust among participants even if they are not personally acquainted. The use of blockchain to log and manage votes guarantees a clear, verifiable process that minimizes the risks of disputes, fraudulent activities, or accidental errors.

- Another key feature is the system's ability to prevent any party from manipulating or censoring transactions. By implementing smart contracts alongside robust voting mechanisms, DAOs effectively reduce the potential for self-serving behavior by individual members, thereby protecting the integrity of both the transaction history and the collective interests of the community.

- Interoperability is also an important aspect, as it allows different DAOs to interact and collaborate seamlessly. This capability enables direct, autonomous exchanges of data and resources between systems, supporting a more integrated and decentralized network environment.

- To maintain active community engagement and ensure ongoing contributions, DAOs often employ token-based incentives. Members earn tokens by participating in organizational activities or by supporting specific projects. These tokens can be linked to economic benefits, participation rights, governance privileges, and practical utility, which encourages the community to grow and actively contribute.

[11] Q. Wang, G. Yu, Y. Sai, C. Sun, L. D. Nguyen, X. Xu e S. Chen, «A First Look into Blockchain DAOs,» in 2023 IEEE International Conference on Blockchain and Cryptocurrency (ICBC), IEEE, 2023, pp. 1–3.
[12] S. Wang, W. Ding, J. Li, Y. Yuan, L. Ouyang e F.-Y. Wang, «Decentralized autonomous organizations: Concept, model, and applications,» IEEE Transactions on Computational Social Systems, vol. 6, n. 5, pp. 870–878, 2019.
[13] A. Wright, «The rise of decentralized autonomous organizations: Opportunities and challenges,» Stan. J. Blockchain L. & Pol'y, vol. 4, p. 1, 2020.

- Finally, because of these transparent and automated decision-making processes, DAOs become more agile and responsive. This responsiveness enhances operational efficiency and innovation, allowing the organization to quickly adapt to changing conditions and the evolving needs of its community.

1.4.3 The Governance System

One critical area to address in the context of DAOs is governance. In this setting, governance refers to the processes by which decisions are made, and activities are managed within the organization. Although current voting practices in DAO projects underscore the decentralized and democratic ethos of these communities, they often encounter challenges in achieving consensus, and their effectiveness can fall short when compared to traditional voting methods [11].

Blockchain technology offers the potential to streamline democratic processes and lower costs, yet direct voting mechanisms demand continuous engagement from participants. Standardizing blockchain governance is therefore essential for improving both reliability and efficiency, while ensuring compliance with regulatory standards and accountability measures. Blockchain governance typically involves designated decision-making authorities, incentive structures, and accountability mechanisms that guide behavior regarding the allocation of scarce resources. However, a universal framework for blockchain governance remains elusive, and many theoretical models are not entirely feasible for on-chain implementation [14]. In response to these challenges, some DAOs are experimenting with alternative approaches, such as vote delegation, quadratic voting, and prediction markets, to enhance decision-making efficiency and mitigate voter apathy.

[14] H. Altaleb e R. Zoltán, «Decentralized autonomous organizations review, importance, and applications,» in 2022 IEEE 26th International Conference on Intelligent Engineering Systems (INES), IEEE, 2022, pp. 121–126.

1.4.4 The Treasury

The treasury represents the financial core of the organization, managed in a decentralized and automated fashion. It is through the treasury that the DAO collects funds from investors, generates revenue from its core activities, compensates contributors, and returns profits to its investors [48]. Consistent with the DAO's principles, all investment-related decisions are subject to a community vote, ensuring that no single member can unilaterally access the accumulated funds unless they are the only participant in the organization [13].

Moreover, the DAO may utilize various types of assets to manage its treasury. These can include governance tokens, stablecoins, or other cryptocurrencies such as Bitcoin or Ether [15] [16]. Governance tokens are issued directly by the DAO and represent a member's stake in the organization, conferring voting rights on internal matters—including the management of the treasury.

In general, the management of funds is secured using a multisignature wallet or a smart contract that requires multiple approvals for any transaction. This approach significantly enhances the security and transparency of all operations, ensuring robust oversight of the financial resources within the DAO.

[15] Superdao. «DAO treasury explained | How DAOs store and spend money,» Youtube. (2022), link: https://www.youtube.com/watch?v=mzDQi23W bvU.
[16] 3. Builders. «DAO TALK #3bis: Treasury Management,» Youtube. (2022), indirizzo: https://www.youtube.com/live/uzf6-YyvZ5A.

1.4.5 The Architecture of a DAO

Until now it has been analyzed the technical structure of a DAO, now it is needful to observe the architecture of it, presented on five different levels proposed by the studies of Wang et al. and Qin et al. .

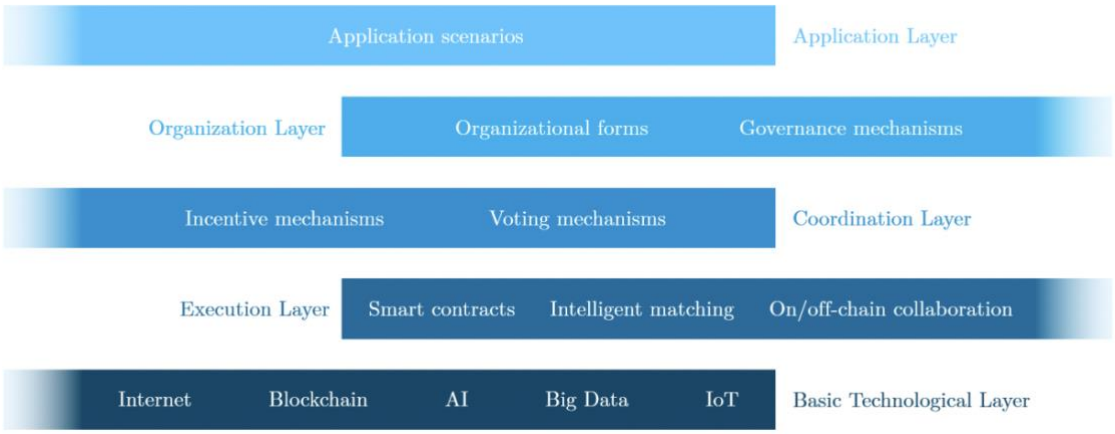


Figure 1.5 :DAO's Architecture

- *Fundamental Technology Layer*

Internet Protocol: DAOs operate on a peer-to-peer (P2P) network that encourages participation from globally distributed nodes. This decentralized communication network ensures that the system remains resilient and free from centralized control.

Blockchain: The hallmark of a DAO is its decentralization and autonomy, which are made possible by blockchain technology. The blockchain provides an immutable ledger where transactions and decisions are recorded transparently, ensuring security and trust throughout the network.

Artificial Intelligence (AI): Advances in AI allow each node within a DAO to function as an autonomous agent. This capability can enhance the efficiency of operations by

enabling nodes to process information and make decisions independently, contributing to the overall responsiveness of the system.

Big Data: Big Data technologies facilitate the real-time collection and analysis of various types of data within a DAO. By leveraging these technologies, the organization can gain crucial insights into its performance and development, supporting informed decision-making and strategic planning.

Internet of Things (IoT): The integration of blockchain with IoT leads to the creation of the Blockchain of Things (BoT). This concept enables the digitalization and incorporation of smart devices and physical assets into the DAO, further expanding its operational capabilities and interconnectivity.

- *Execution Layer*

This second level encompasses the execution technologies that underpin consensus and problem resolution within a DAO. At this stage, several key elements contribute to the effective operation and management of the organization.

Smart contracts form the foundation of the DAO's operational framework. In traditional settings, contracts serve to regulate relationships and secure the rights of involved parties. In a DAO, these contractual agreements are encoded as smart contracts, which automatically enforce rules and execute transactions. This mechanism provides the organization with inherent security, transparency, and fairness.

Complementing smart contracts, *smart algorithms* enhance governance by leveraging digital processes to analyze data and facilitate decision-making. Unlike static smart contracts, these algorithms possess advanced analytical capabilities that improve the coordination and responsiveness of the DAO's internal processes.

Intelligent matching is another critical component. By incorporating artificial intelligence, DAOs can streamline the interconnection of individuals, organizations, and services within decentralized networks. This technology minimizes communication costs and bolsters overall operational efficiency by enabling more effective collaboration among participants.

Finally, DAOs adopt a dual approach to collaboration that integrates both *on-chain and off-chain governance*. On-chain processes, managed via smart contracts, ensure that consensus and decision-making are conducted in a transparent and automated manner. Meanwhile, off-chain governance supplements these processes by facilitating discussions, deliberations, and negotiations outside of the blockchain environment. This hybrid model ensures that while the integrity of decisions is maintained through on-chain validation, the flexibility and nuance required for complex decision-making are supported by off-chain interactions.

Together, these execution-level technologies not only secure the operational and decision-making processes of DAOs but also enhance their ability to adapt rapidly to emerging challenges and opportunities in a decentralized ecosystem.

- *Coordination Layer*

This layer is aimed at regulating the internal coordination within a DAO's division of labor, ensuring that decisions are made collectively in a trustless environment. DAOs create an autonomous and dynamic system that leverages various incentive mechanisms and voting procedures to align the efforts of its members and promote seamless organizational coordination.

Incentive Mechanisms: To fully engage members in the DAOs governance and enhance both security and reliability, a range of incentive mechanisms is implemented. These include the generation and distribution of tokens, reputation systems, and the assignment of governance rights. By combining multiple forms of incentives, a DAO can meet the

diverse needs of its participants, motivating them to work collaboratively toward shared organizational objectives. Each DAO has the capability to issue its own token and define parameters regarding its circulation, distribution methods, and other aspects of the token model. This approach is designed to align the interests of all participants, ensuring that every node benefits from the coordinated effort.

Voting Mechanisms: Equally critical to coordination is the voting process. Key decisions—such as changes to protocols, governance issues, and the management of funds—are subject to voting on the blockchain by all DAO members. This direct voting process ensures that decisions reflect the collective consensus. In contrast, the day-to-day operations and routine management are typically handled by an elected committee. In cases of disagreements or disputes among members, decentralized arbitration methods or mechanisms like "rage quitting" are often employed to resolve conflicts. This dual approach of on-chain voting for strategic decisions and delegated management for operational tasks helps maintain both transparency and efficiency within the DAO.

- *Organization Layer*

The organizational layer is focused on harnessing technology to achieve the overall strategic objectives of the organization at a macro level. This structure forms the foundation of DAOs, representing a collaborative system where strategic goals are pursued with personnel as the central element. One of the primary management challenges is the division of labor—the effective assignment of diverse tasks. DAOs address this by distributing powers, responsibilities, and resource allocation in a decentralized and distributed manner, thereby creating an organizational framework that is community-owned.

*Organizational Form***:** DAOs can be classified into three types based on the degree of decentralization and distribution of power. In "distributed multiple centers," the traditional central node's authority is fragmented among several smaller central nodes, resulting in a balanced coexistence. In "entirely distributed centers," power is uniformly

spread across all nodes, ensuring equal participation. Conversely, “unequal centers” feature an imbalanced distribution of power among nodes, leading to varying levels of organizational rights among members.

Governance Mechanisms: DAOs typically employ three distinct governance approaches. The first is the off-chain proposal mechanism, where proposals are submitted and deliberated in dedicated forums outside the blockchain. The second is the on-chain proposal mechanism, in which proposals are directly introduced and voted on within the blockchain environment. Finally, a hybrid model combines both approaches: proposals are initially discussed and refined in off-chain forums and subsequently published on the blockchain for member voting. This dual process not only enhances transparency and inclusivity but also ensures that decisions reflect the collective will of the community while maintaining the integrity of the decentralized system.

- *Application Scenarios*

DAOs manifest a wide array of forms and applications, which occupy this final layer of the architecture. Depending on the range of services provided, a DAO may incorporate digital currencies such as Bitcoin, utilize public development platforms like Ethereum, or even integrate interconnected IoT devices—for example, sensors used for energy monitoring. Moreover, as previously mentioned, there are notable differences in the degree of decentralization, with some DAOs operating on public blockchains while others are built on consortium models.

1.4.6 A Focus on the Voting Mechanism

This final section of our literature review focuses on voting mechanisms, one of the three pillars—alongside blockchain and smart contracts—that underpin the structure of DAOs. A deep understanding of these mechanisms is essential to grasp how decentralized autonomous organizations operate.

Fan et al. identified seven primary voting methods commonly used in contemporary DAOs [17]:

Authorized Relative Majority (ARM): In this method, a proposal is approved if it secures support from at least 50% of the voting power engaged in the decision. However, ARM can be vulnerable to manipulation if misleading proposals are submitted without sufficient scrutiny—often referred to as a "slip-through" risk—which poses a significant security concern.

Token-Based Quorum (TBQ): Similar to ARM, TBQ requires a higher level of participation to pass a proposal, thereby mitigating the "slip-through" issue and enhancing vote security. By setting a participation threshold, TBQ aims to involve a broader range of nodes. Nevertheless, this requirement for increased participation may prolong the decision-making process.

Quadratic Voting: This system blends the principles of “one token, one vote” with “one person, one vote” by making the cost of additional votes increase quadratically. For example, while one vote might cost a single token, casting two votes could cost four tokens, and three votes might cost nine tokens. This structure discourages disproportionate influence by any single participant while allowing voters to express the intensity of their preferences.

Liquid Democracy: Liquid democracy offers flexibility by enabling participants to either vote directly or delegate their voting rights to more knowledgeable representatives. Although this delegation can improve overall voting efficiency, it introduces the potential for power centralization. The dynamic nature of delegation—where votes can be retracted or re-assigned at any time—helps to counteract this risk, ensuring that no single group can dominate the decision-making process.

Weighted Voting: In weighted voting systems, members with greater reputation or expertise carry more voting power. An example of this approach is Knowledge-

[17] Y. Fan, L. Zhang, R. Wang e M. A. Imran, «Insight into voting in DAOs: conceptual analysis and a proposal for evaluation framework,» IEEE Network, vol. 38, n. 3, pp. 92–99, 2023.

Extractable Voting, where individuals receive additional weight based on their knowledge tokens. These tokens reward voters whose choices align with the eventual outcomes while penalizing those whose votes diverge, thereby promoting informed decision-making.

Rage Quitting: This mechanism allows members who disagree with a decision to exit the DAO and recover their staked tokens. A "grace period" exists between the approval of a proposal and its execution, during which dissatisfied members can choose to leave, thereby preventing a small group of dominant members from imposing unwanted decisions. Although effective at preserving decentralization, this process can slow down overall decision-making efficiency.

Holographic Consensus (HC): HC introduces a prediction market element to the governance process. In this model, members and external participants can wager on whether a proposal will pass or fail using a dedicated token (GEN). HC operates in two modes: "boosted proposals," which require only a simple majority when enough GEN is staked, and "queue proposals," which need an absolute majority when they do not meet the GEN threshold. While this system enables individuals with limited voting power to have their opinions heard, it also raises concerns about potential distortions in the collective will if those betting on outcomes exert disproportionate influence.

Together, these diverse voting mechanisms form a critical part of the governance framework in DAOs. They ensure that decisions are made transparently and collectively, while also addressing the inherent challenges of operating in a decentralized, trustless environment.

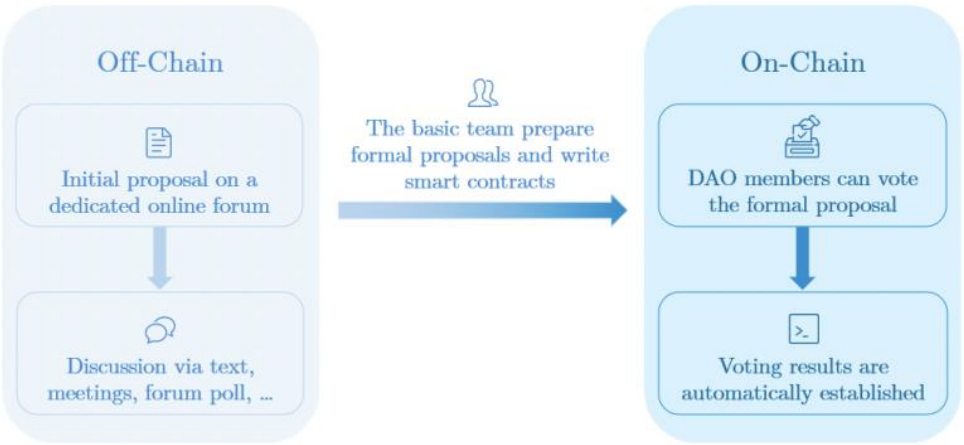


Figure 1.6 :Voting Process in a DAO

CHAPTER 2. Industry Insights and Needs. The Startup Business idea

2.1 Industry Dynamics and the role of the digitalization

2.1.1 Worldwide Tourism Market Insights and Costumers preferences

The international tourism and travel industry is among the most vibrant and significant sectors in the global economy. In 2019, the market reached a valuation exceeding 8.9 trillion dollars, accounting for 10.3% of global GDP [18]. Following a notable decline caused by the COVID-19 pandemic, the sector has since rebounded and resumed rapid growth. According to forecasts by the World Travel & Tourism Council (WTTC), the sector is expected to achieve an annual average growth rate (CAGR) of roughly 5.8% in the upcoming five-year period. Increasing international travel demand, growing interest in experiential tourism, and the recovery of business-related travel are key drivers of this ongoing expansion. Currently, the industry's total valuation stands at approximately 11.1 trillion dollars.

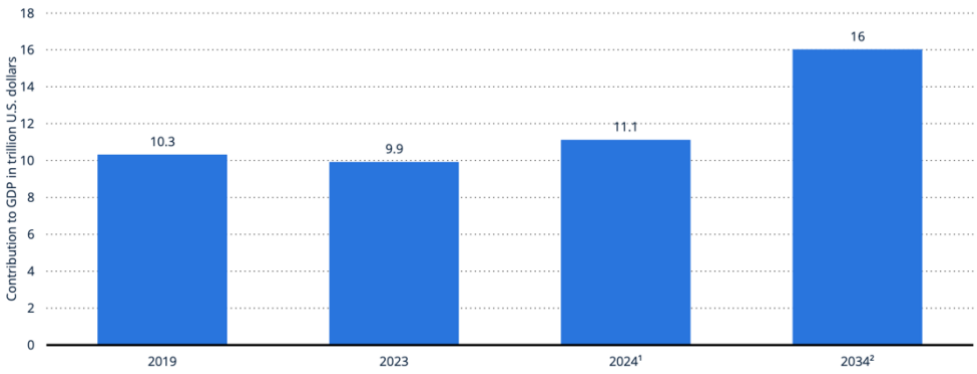


Figure 2.1 : Contribution to GDP of the Tourism Market

[18] World Travel & Tourism Council (WTTC). (2024). Tourism worldwide: Total contribution of travel and tourism to GDP worldwide 2019-2034 (Statista Dossier). Statista. Retrieved from: https://www.statista.com

Market segmentation highlights a clear distinction between leisure travel and business-related travel, with leisure tourism representing around three-quarters of total spending. Within this market, the hotel sector emerges as the largest segment, projected to reach a value of 426.5 billion dollars by 2024 and expected to further expand to approximately 511.9 billion dollars by 2029 [19]. This growth is mainly driven by increased consumer interest in experiential tourism and by rising disposable incomes in several emerging markets. Conversely, the business travel sector experienced a notable decline due to the pandemic but is now rebounding, supported by enhanced digital services and the renewed frequency of international business engagements that require travel.

The post-pandemic recovery trajectory distinctly underscores leisure travel as the predominant force behind renewed sectoral momentum. This trend is well reflected in the prominent positioning of key international markets, with the United States, China, and Germany at the forefront. Specifically, the United States emerged as the leading global tourism market in 2023, with a travel and tourism GDP contribution of approximately 2.36 trillion dollars, significantly outperforming other international markets. Meanwhile, China maintained its relevance within the global tourism industry despite its recovery challenges, accounting for a substantial 1.3 trillion dollars, followed by Germany, whose tourism industry contributed approximately 487.6 billion dollars to its GDP in the same year [18].

Parallel to this financial and geographical market consolidation, there has been a marked evolution in traveler preferences, prominently featuring sustainability as a core concern. An overwhelming majority, approximately 83% of global travelers, consider sustainable travel practices as a critical factor influencing their travel choices for 2024.

This growing global sentiment towards sustainability indicates a transformative shift within the tourism sector, influencing industry practices and strategies significantly. Consequently, companies within the tourism industry are increasingly compelled to adapt and innovate, implementing sustainable practices to align with consumer expectations and maintain competitiveness.

The shift toward sustainable tourism practices is likely driven by multiple converging factors, including heightened consumer awareness of climate change, greater emphasis

[19] Pencarelli, T. (2020). The digital revolution in the travel and tourism industry. Information Technology & Tourism, 22(3), 455–476. https://doi.org/10.1007/s40558-019-00160-3

on environmental responsibility, and the widespread dissemination of information on the impacts of travel. The market's response includes enhanced investment in sustainable infrastructures, environmentally friendly transportation alternatives, and eco-conscious accommodations. The integration of sustainable practices is becoming not only a strategic differentiation factor but also a baseline expectation for businesses operating in the global tourism market.

Furthermore, the emphasis on sustainability aligns closely with experiential tourism trends, reinforcing consumer interest in authentic, meaningful experiences that are environmentally and culturally responsible. Such convergence is reshaping market dynamics, compelling destinations and service providers to innovate continuously to address evolving consumer preferences effectively. This dual emphasis—on sustainability and experiential authenticity—sets the stage for future research and policy initiatives aimed at supporting balanced and responsible growth in global tourism, ensuring both profitability and environmental stewardship.

2.1.2 The Global Online Travel Market

The global online travel market represents one of the most rapidly expanding segments within the broader tourism industry, demonstrating substantial growth in recent years. Specifically, the market size of online travel exceeded 600 billion U.S. dollars in 2023, reflecting a strong post-pandemic rebound and robust adoption of digital solutions among consumers. Furthermore, industry forecasts anticipate continuous and significant growth, projecting the market to reach approximately 838 billion U.S. dollars by 2029, underscoring its central role in the evolving tourism ecosystem [20].

[20] *Global Market Insights. (2024). Online Travel Market Report 2024–2032. Retrieved from https://www.gminsights.com*

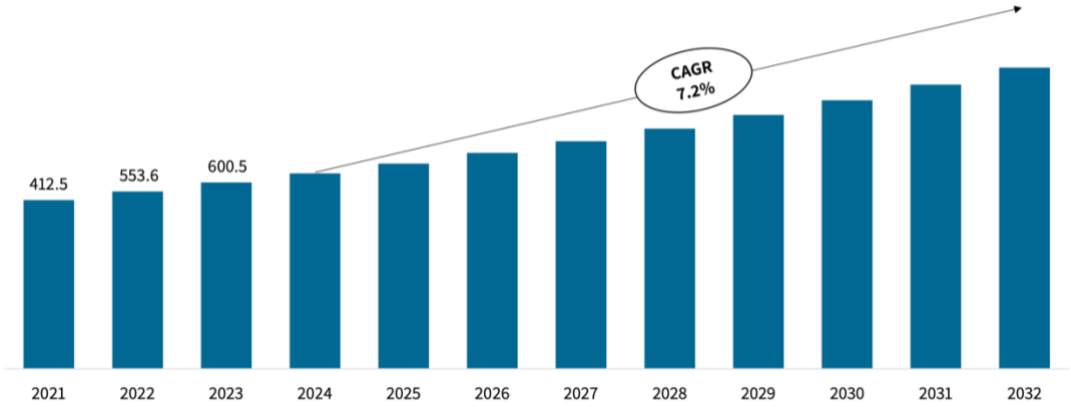


Figure 2.2 : Global Online Travel Market Trend (2021/2032)

The following table provides a detailed breakdown of the global online travel market, highlighting estimated market values across individual segments such as airlines, car rentals, rail, cruise, bus services, accommodations, and tour packages, thereby offering insights into the relative weight and importance of each segment within the broader online travel industry.

Segment	Description	Market Share	Market Value (USD Billion)
Airline	Online services facilitating the booking of flights, providing options to compare fares, select seats, and manage reservations.	**30%**	**180**
Car Rental	Platforms enabling users to reserve rental vehicles online, choosing from various models, locations, and rental periods.	**8%**	**48**
Rail	Online booking systems for train travel, offering schedules, seat reservations, and ticket purchases across railway networks.	**7%**	**42**
Cruise	Websites and agencies specializing in cruise bookings, offering itineraries, cabin selections, and onboard amenities for sea voyages.	**5%**	**30**
Bus	Platforms facilitating online booking of bus tickets, providing routes, schedules, seat selections, and payment options for ground transportation.	**3%**	**18**
Accommodation	Online services allowing users to search, compare, and book accommodations such as hotels, resorts, hostels, vacation rentals, and bed-and-breakfasts.	**35%**	**210**
Tour Packages	Online offerings that bundle multiple travel components into cohesive packages, typically including accommodations, transportation, activities, and sometimes meals.	**12%**	**72**

Table 2.1 : Subdivision of the Global Online Travel Market, Global Market Insights (2024)

Within the online travel sector, two primary segments emerge distinctly. Online Travel Agencies (OTAs), such as Booking Holdings and Expedia Group, represent the dominant players, leading both in transaction volumes and user engagement. These platforms benefit from expansive digital reach, comprehensive offerings, and advanced user interfaces, enabling them to effectively meet diverse consumer demands. Concurrently, the second key segment is represented by Direct Travel Suppliers, including major airlines and hotel chains. These suppliers are increasingly developing and enhancing proprietary digital platforms aimed at fostering disintermediation, thereby reducing dependence on third-party OTAs. This strategic approach allows direct service providers to optimize profitability, offer more tailored services, and efficiently leverage customer data to strengthen direct consumer relationships (Global Market Insights, 2024, p. 6). The coexistence and competition between these two segments shape the overall dynamics and growth trajectory of the global online travel market.

A critical development within this context is the substantial shift from desktop to mobile-based booking methods as indicated in *2.1 Table* . The rising prevalence of smartphone usage and mobile connectivity has significantly influenced consumer behavior, driving an accelerated adoption of mobile booking solutions. This behavioral shift underscores the imperative for industry stakeholders to enhance mobile user experiences and prioritize app-based interactions. Consequently, mobile platforms have become central in customer acquisition strategies, given their role in facilitating immediacy, convenience, and personalized user experiences.

Segment	2021	2022	2023
Mobile-based	229,426.59	309,938.66	338,443.31
Web-based	183,062.78	243,622.08	262,059.37
Total	**412,489.37**	**553,560.73**	**600,502.68**

Table 2.2 : Distribution of paid travel databases, Global Market insights (2024)

Another crucial driver reshaping the online travel market involves technological innovation, particularly through Artificial Intelligence (AI), Internet of Things (IoT), and Virtual Reality (VR). These technologies significantly enhance the personalization of user experiences and streamline operational efficiency. For instance, AI-driven algorithms provide customized travel recommendations based on consumer preferences and past behaviors, while VR enables immersive previews of destinations and accommodations. IoT applications, including smart hotel rooms and luggage tracking systems, further enrich the travel experience by offering heightened convenience and control to travelers [21].

The trajectory towards digitalization in travel also highlights intensified market competition, dominated by global leaders such as Booking Holdings, Expedia Group, and Airbnb. These major corporations are not only competing on traditional metrics of price and variety but increasingly on technological innovation, user experience quality, and sustainability integration. As such, the competitive landscape continues to evolve rapidly, compelling both large and smaller market participants to adapt their strategies proactively to remain viable.

Ultimately, the ongoing shift toward digitalization within the global tourism sector profoundly reshapes conventional business models. This evolution urges industry players to integrate advanced technological solutions, emphasize mobile-based platforms, and leverage digital innovation not merely as supplementary features but as essential strategic assets. As market dynamics continue to evolve, companies must proactively engage with these digital trends, positioning technology-driven practices at the core of their competitive strategies to ensure sustained relevance and long-term growth.

An overview of the key trends within this dynamic subsector will be presented, segmented by main geographical region:

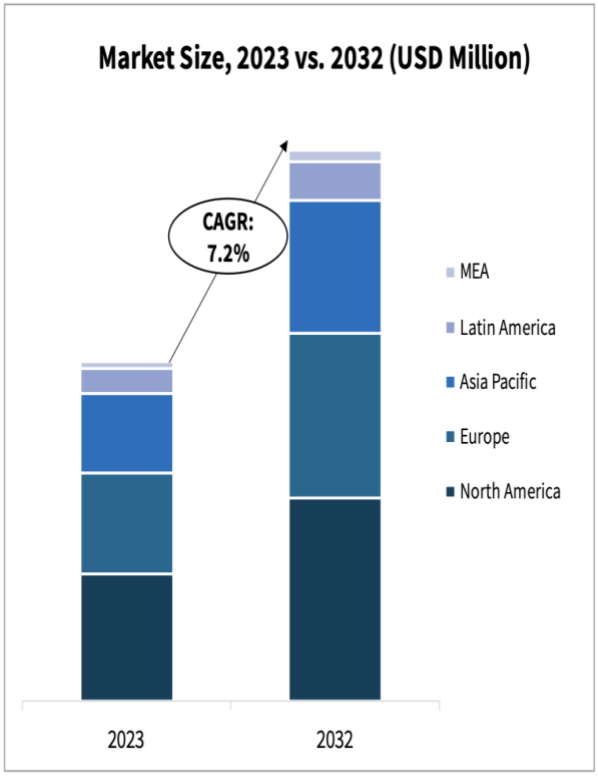
[21] Pencarelli, T. (2020). The digital revolution in the travel and tourism industry. Information Technology & Tourism, 22(3), 455–476. https://doi.org/10.1007/s40558-019-00160-3

○ In 2023, North America dominated the global online travel market with approximately 35% of total market share. This region, especially the U.S. and Canada, benefits from extensive internet accessibility and widespread smartphone use, significantly fostering the adoption of online travel booking services.

○ The Asia-Pacific (APAC) region is witnessing substantial growth in the online travel sector, driven primarily by enhanced internet access, an expanding middle-class population, and increased consumer preference towards international travel experiences.

○ In March 2024, the United States Department of Commerce initiated a new promotional campaign to attract more international tourists, collaborating with online travel companies to offer exclusive discounts and promotional packages. This effort led to a notable 25% growth in travel bookings directed towards the U.S.

○ In March 2024, China's government announced a new Smart Tourism Development Plan, which emphasizes the integration of advanced technologies such as Artificial Intelligence (AI), Big Data analytics, and the Internet of Things (IoT) into the travel industry. This strategic move aims to significantly enhance the user experience in online travel by offering more personalized and innovative services.



Source: www.gminsights.com

2.1.3 The Italian Market

In 2023, the Italian tourism sector reached an overall value of approximately USD 140.8 billion, marking a significant increase of 15.3% compared to the previous year. This impressive growth signifies a strong recovery from the pandemic-related downturn, highlighting Italy's resilience and persistent appeal as a global travel destination. Forecasts anticipate continued expansion, projecting the market's value to reach USD 201.3 billion by 2028, an increase of 43% within a five-year span [22].

Italy's prominence in the European tourism landscape is underscored by its contribution, accounting for 11.7% of the continent's total market. Such a substantial share not only emphasizes the country's economic relevance but also reinforces Italy's competitive position relative to other major European tourist destinations, including France, Spain,

[22] *MarketLine. (2024). Travel & Tourism in Italy: Industry Profile 2024. MarketLine Industry Profile, p. 2.*

and Greece. Italy's market advantage largely stems from its unique blend of cultural heritage, historical significance, natural attractions, and culinary excellence.

Despite these favorable outcomes, Italy's full tourism potential remains underexploited, especially in the digital domain. Compared to other European markets, Italy still possesses considerable room for digital growth, representing untapped opportunities to enhance its competitive positioning further.

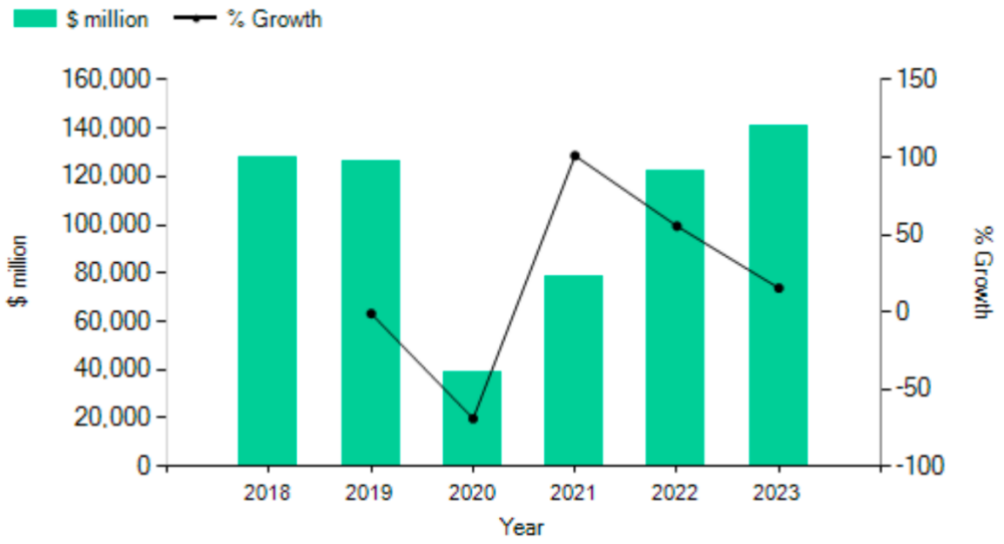


Figure 2.3 : Italian Travel Market Trend, Marketline Industry Profile (2024)

An insightful examination of the Italian travel and tourism market segmentation between 2018 and 2023 highlights significant dynamics within different service categories. Hotels and motels consistently dominated the industry, capturing the largest market share throughout the observed period. In 2018, this segment represented 58.3% of the overall tourism market, and by 2023, despite fluctuations influenced primarily by the COVID-19 pandemic, it stabilized at a commanding 60.0%. The peak occurred in 2021, at the height of pandemic-related travel restrictions, when this segment surged to 69.5%, possibly reflecting a stronger domestic travel reliance on hotel-based stays as international travel declined sharply.

Passenger airlines, representing another crucial component of Italy's travel market, experienced significant volatility during the reviewed period. Initially accounting for 18.4% in 2018, this segment saw a dramatic decline to 7.4% in 2021 due to stringent international travel restrictions and reduced flight capacities. However, as restrictions

lifted and international routes reopened, passenger airlines notably rebounded, reaching 18.3% by 2023, underscoring a resilient recovery and highlighting a restored consumer confidence in air travel as a preferred transportation mode for both domestic and international travel.

Travel intermediaries maintained a relatively stable position throughout the years, reflecting their consistent role as essential facilitators within the tourism ecosystem. Their share varied modestly from 11.8% in 2018 to 11.2% in 2023, peaking briefly at 12.7% in 2021. This stability suggests a persistent value placed by consumers on convenience, personalized service, and expert guidance, which intermediaries effectively offer, particularly during periods of uncertainty.

Foodservice, closely connected to hospitality and tourism, witnessed fluctuations directly linked to changes in consumer behavior and tourism flows. This segment, initially holding a 10.5% share in 2018, rose sharply to 13.7% in 2020, potentially as consumers sought safe, controlled dining experiences within hotel premises or through takeaway and delivery options during the pandemic. However, as conditions normalized, the segment share declined to 9.9% by 2023, reflecting a gradual return to pre-pandemic consumer patterns, including increased patronage of independent restaurants and cafes.

Lastly, passenger rail remained a niche but stable category within Italy's travel industry. Its market share held steady around 0.9% in 2018 and 2019 but slightly declined to 0.6% in 2023. This reduction may reflect broader consumer preferences shifting toward faster travel options, such as airlines, or more personalized transportation modes.

Overall, the segmentation analysis reveals a tourism market characterized by a robust dominance of the hospitality sector (hotels & motels) complemented by resilient recoveries in air travel, a steady demand for travel intermediaries, fluctuating patterns in foodservice aligned with external conditions, and modest but stable rail transportation. Understanding these trends provides valuable insights for stakeholders aiming to optimize strategic investments and operational planning in Italy’s vibrant tourism market

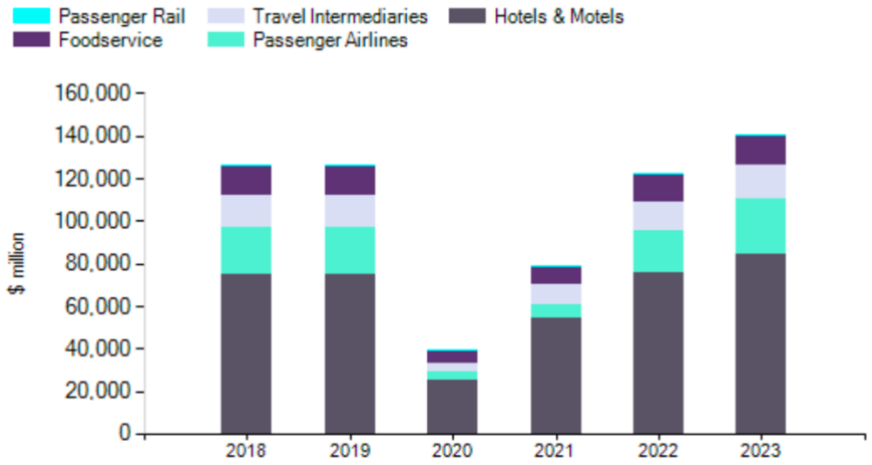


Figure 2.4 : Italy Travel & Tourism industry category segmentation, Marketline Industry Profile (2024)

Within the Italian tourism landscape, there has been a significant surge in the adoption of digital tools, particularly among international tourists. These travelers increasingly use online platforms for trip planning and reservations, favoring digital channels for accessing Italy's rich touristic offerings. Conversely, Italian domestic travelers exhibit comparatively less enthusiasm toward exclusively digital solutions, demonstrating a partial resistance or slower adoption rate [23].

Within the Italian tourism landscape, there has been a significant surge in the adoption of digital tools, particularly among international tourists. These travelers increasingly use online platforms for trip planning and reservations, favoring digital channels for accessing Italy's rich touristic offerings. Conversely, Italian domestic travelers exhibit comparatively less enthusiasm toward exclusively digital solutions, demonstrating a partial resistance or slower adoption rate .

This disparity presents both challenges and opportunities for tourism operators. Operators face the task of educating and encouraging domestic users to adopt digital solutions fully, while also enhancing their platforms to capture the highly digitalized international audience more effectively.

[23] *Banca d'Italia. (2024). Indagine sul turismo internazionale: Statistiche – 18 giugno 2024. Banca d'Italia. Retrieved from* https://www.bancaditalia.it/statistiche/tematiche/rapporti-estero/turismo-internazionale/index.html

Increased Mobile penetration

A significant trend within Italy's tourism industry has been the accelerated adoption of mobile technologies. Smartphone penetration has reached new heights, prompting substantial shifts in consumer behaviors, particularly concerning online bookings and travel planning. According to the Bank of Italy (2024), foreign travelers demonstrate a strong preference for mobile-based platforms when booking accommodations, transportation, and related services, largely due to convenience, ease of use, and real-time accessibility. Although Italian travelers have shown slightly lower levels of mobile adoption compared to international tourists, there is still a noticeable upward trajectory, suggesting potential for substantial growth. Therefore, tourism operators in Italy are strongly encouraged to prioritize investment in mobile-optimized platforms, dedicated apps, and responsive website designs to attract both domestic and international travelers effectively.

Personalized Experiences through Advanced Technologies

Another critical development in the Italian online tourism market is the rapid integration of advanced digital technologies, particularly Artificial Intelligence (AI) and Big Data analytics. These technological advancements are enabling travel companies and platforms to offer highly personalized experiences, significantly enhancing customer satisfaction and fostering loyalty. The Bank of Italy's (2024) report highlights that tailored recommendations, personalized promotions, and data-driven customer service interactions have become pivotal elements for competitive differentiation within Italy's tourism sector. Operators utilizing these tools have observed improved engagement and higher rates of repeat visits, suggesting that personalization is no longer optional but essential for sustained market competitiveness in the digital era.

Sustainable and Experiential Tourism:

Sustainability and experiential authenticity have become critical focal points in traveler preferences, particularly among international visitors to Italy. The Bank of Italy's recent analysis underlines a noticeable increase in the demand for environmentally responsible and culturally immersive travel experiences. This emerging trend has encouraged the proliferation of digital platforms explicitly focused on sustainability, local community engagement, and responsible tourism practices. Digital channels that effectively promote and facilitate sustainable tourism offerings—such as eco-friendly accommodations, authentic local experiences, and responsible consumption choices—are witnessing significant growth opportunities within the Italian market. Operators and platforms prioritizing these factors can capitalize on an expanding consumer segment that values meaningful and environmentally conscious travel.

2.2 Problem Description: Complexity in Travel Planning, Asymmetry and Fragmentation of Information Sources, Consequences for Travelers

In today's increasingly interconnected and digitally driven environment, the process of travel planning has evolved into a complex undertaking for travelers. Despite the abundance of accessible online tools and information, travelers often encounter significant difficulties due to fragmented sources and asymmetric information, impacting their overall travel experience. This situation underscores the need to understand the specific factors influencing contemporary travel planning behaviors and their broader implications for travelers.

This industry naturally generates a large amount of data and information originating from multiple market players. As a result, many platforms have been established to collect and integrate such information, subsequently providing it to end consumers. These platforms aim to offer improved and more streamlined travel solutions, thereby optimizing both expenses and the time required for travelers to complete their searches.

This analysis emphasizes the challenges related to complexity and uneven distribution of information inherent in the travel sector. Planning excursions, which should ideally represent moments of excitement and discovery, often turns into an overly complicated and exhausting task. Travelers frequently struggle to sift through diverse information sources such as Google Reviews, TikTok, and TripAdvisor, each providing fragmented insights along with inconsistent, conflicting, and incomplete reviews. This fragmented landscape prevents travelers from obtaining a clear and comprehensive overview of the available activities and experiences, causing confusion and frustration among users [24].

The difficulty in making informed decisions arises mainly from the dispersed and imbalanced nature of these information platforms. Different websites specialize in varying aspects of travel; for instance, TikTok emphasizes visually appealing user-generated experiences, whereas TripAdvisor is primarily oriented towards accommodation reviews. Moreover, the reliability and accuracy of provided information are inconsistent, often outdated, or devoid of adequate context, forcing travelers to independently verify and select options that meet their specific needs. This process demands significant time and effort, ultimately becoming impractical or overwhelming for most individuals.

An examination of content shared on social media platforms highlights the growing prominence of travel and experiential content. Numerous influential figures, including bloggers and social media influencers, regularly document their journeys to share insights and information related to travel. However, this trend is not limited exclusively to high-profile personalities; it has become widespread among ordinary users across different age groups. This phenomenon directly relates to the shift previously described; historically, travelers relied primarily on offline resources to gather trip information. Digitalization has profoundly altered this dynamic, reshaping behavior and steering users towards online resources.

Research conducted by Singidunum University illustrates this transformation clearly, revealing that over 44% of respondents depend heavily on bloggers' and influencers' opinions when organizing and finalizing their travel plans. Additionally, participants frequently utilize forums (37%), social platforms such as Facebook, TikTok, and Instagram (37%), and video platforms like YouTube and Vimeo (16%) as primary

[24] *Petracca, M. (2019).* L'immagine turistica nell'era del travel 2.0: Il ruolo degli user-generated content e dell'electronic word-of-mouth.

informational sources. Interestingly, these same users also actively contribute to perpetuating this cycle by generating and sharing further travel-related content. According to the study, around 76% of travelers share their travel experiences on social media, 40% regularly interact with content focused on activities and attractions, and over 90% express reliance on travel recommendations posted by friends on these online networks [25].

The significant shift in approach has empowered travelers to plan their trips with greater flexibility, allowing them to seek information tailored specifically to their personal interests, instead of being limited by the constraints typically associated with offline reservations, which often offer standardized travel packages. Today, travelers actively seek experiences that are highly customized to their unique preferences. Furthermore, the tourism industry has been profoundly shaped by the widespread adoption of social media, particularly among travelers classified as "2.0 tourists." Supporting this perspective, additional market research highlights that travelers' decisions regarding vacation destinations are heavily influenced by online reviews and user-generated content [26].

Social media has substantially expanded and enhanced the capability of individuals, commonly termed "2.0 tourists," to share their travel experiences with a wider audience. This has resulted in an extensive array of information, which, while potentially advantageous for travel planning purposes, often creates confusion due to its fragmented and asymmetrical nature. This thesis aims to address and resolve the specific challenges arising from the new paradigm of searching for travel information through online platforms.

Furthermore, in today's social media-driven environment, individuals increasingly feel compelled to share their personal experiences online, effectively creating detailed narratives of their lives within virtual communities. Various digital platforms have emerged to cater to this growing demand; however, people typically gravitate toward specific social networks depending on their intended communication goals. This behavior has led to a distinctive segmentation or "clustering" of social networks, where each

[25] *Interneta na poslovanje, U., & Svetu, U. S. I. (n.d.).* Impact of internet on business activities in Serbia and worldwide. *Singidunum University.*

[26] *Newebsolutions. The impact of social media on travel and vacations. Retrieved from https://www.newebsolutions.com/impatto-social-media-su-viaggi-e-vacanze/*

platform assumes its unique function and identity. This specialization aligns precisely with the foundational purpose behind the creation of different social media channels.

It is widely acknowledged that once platforms enter the market, their interactions with end users significantly shape their trajectory. These users effectively become the driving force, determining both the virality and distinct purpose of each platform. Therefore, one might conclude that end users ultimately define the core functionalities of these digital environments [27]. A prime example is the evolution of Instagram, today one of the world's most popular social media platforms. Originally launched under the name "Burbn," the app initially allowed users to check into locations, post photos, and earn points through activities related to Bourbon whiskey. However, the app's creators soon realized that it was overly complex, offering several unnecessary features. By carefully analyzing user preferences and behaviors, they discovered that photo-sharing was the most highly valued functionality. Consequently, the developers decided to remove all non-essential features and refocus exclusively on photography. This decision led to Instagram's transformation into a platform renowned for its simplicity and immediacy, facilitating instant sharing and user interactions through "likes" and comments.

[27] *Investopedia.The story of Instagram: The rise of the #1 photo-sharing app. Retrieved from https://www.investopedia.com/articles/investing/102615/story-instagram-rise-1-photo0sharing-app.asp*

2.3 The startup Business Idea

To effectively address and solve the previously outlined challenges faced by contemporary travelers—specifically, the complexity, fragmentation, and dissatisfaction involved in gathering reliable travel information—a dedicated digital application has been conceptualized. This startup aims to provide an innovative solution tailored explicitly to overcoming these critical issues. The primary purpose of the application is to offer travelers a streamlined, user-friendly, and highly efficient digital tool, significantly simplifying the travel planning process, especially following flight and accommodation bookings. By leveraging verified, authentic, and local insights, the app seeks to align traveler expectations closely with real experiences, thus enhancing overall satisfaction and transforming the traditional travel-planning paradigm.

In this subchapter, the underlying purposes and motivations driving the business idea will be conceptualized and explored from a theoretical perspective. Subsequently, the following chapter will present an empirical study aimed at analyzing the potential benefits and positive aspects of Decentralized Autonomous Organizations (DAOs), with the goal of practically applying these insights to enhance and effectively implement the proposed startup concept.

2.3.1 The Value Proposition

The platform's value proposition originates from the clear identification and thorough understanding of a widespread and increasingly relevant issue affecting contemporary travelers: the significant difficulty encountered during effective travel organization, particularly after securing flights and accommodation. Today, travelers are often compelled to sift through multiple online sources, confronting fragmented, contradictory, incomplete, or outdated information. This fragmented approach frequently leads to confusion, substantial time expenditure, frustration, and dissatisfaction throughout the planning process, ultimately diminishing travelers' overall enthusiasm and negatively affecting the quality of their travel experiences. The complexity of gathering accurate and

reliable information thus represents a tangible barrier that the proposed solution explicitly addresses.

This situation frequently results in disappointing or unforeseen experiences once travelers reach their destination, significantly diminishing their excitement and overall satisfaction with the journey. To effectively address and mitigate this problem, our platform is committed to delivering a highly innovative and distinctive digital solution, differentiating itself clearly from existing offerings available in the market. Rather than directly competing with major, well-established platforms specializing in standard booking services, our initiative targets a niche market segment that remains largely underserved. Specifically, our solution focuses on the creation of uniquely tailored and authentic travel itineraries, meticulously curated through verified recommendations provided firsthand by residents.

By doing so, travelers can enjoy highly personalized experiences that align closely with their expectations, resulting in richer, more meaningful journeys that avoid conventional tourist traps and ensure genuine interactions with local cultures. This mode allows not only to simplify the planning, but above all to guarantee travelers authentic and meaningful experiences, far from the classic tourist traps.

The platform generates significant value by establishing a direct and effective connection between two distinct yet mutually reinforcing segments: travelers and local communities. From the travelers' perspective, the primary advantage lies in gaining access to swift, customized, and genuinely authentic travel planning, resulting in fully personalized itineraries that precisely align with their unique interests, needs, and expectations.

The core strength of the platform's value proposition is its capability to transform what traditionally has been an intricate, fragmented, and often frustrating planning process into an intuitive, smooth, and enjoyable experience. Moreover, the platform ensures a high degree of authenticity and reliability, maintaining consistency between the expectations formed during the planning stage and the actual experiences encountered during the journey, thereby enhancing traveler satisfaction and creating lasting positive impressions.

Conversely, the value created for local communities becomes apparent through the direct opportunity they receive to share their insights, local expertise, and genuine recommendations with travelers. By facilitating this interaction, the platform enables residents to actively participate in showcasing a more profound, authentic, and nuanced

representation of their cultural heritage and community identity. Consequently, this approach empowers local communities economically, allowing them to derive meaningful financial benefits from sustainable and responsible tourism practices, while simultaneously providing tangible recognition for their valuable contributions. This mutually beneficial interaction fosters an authentic exchange, uniquely positioning the platform to effectively cater to the specific requirements of both travelers and local locals. Ultimately, this approach establishes a self-reinforcing ecosystem centered on authenticity, personalization, cultural exchange, and the long-term sustainability of travel experiences.

2.3.2 Focus on Locals's Involvement

Given that local communities represent the core engine of the platform's value creation process, it is essential to dedicate a specific section to illustrate how their involvement is structured. Their direct contribution not only ensures the authenticity and uniqueness of the travel experiences offered but also differentiates the business idea from more standardized and impersonal travel solutions. For this reason, the following subchapter is entirely devoted to explaining the model through which locals are engaged, empowered, and rewarded within the ecosystem, highlighting their fundamental role in delivering personalized, meaningful itineraries to travelers.

To foster long-term engagement and encourage locals to consistently contribute valuable reviews and timely updates, the platform adopts a structured incentive mechanism that forms an integral part of its DAO-based governance model. This system is specifically designed to reward positive behavior and support the ongoing generation of high-quality, localized content. At the core of this mechanism is the issuance of three distinct categories of virtual tokens—referred to as red coins, yellow coins, and green coins. Each token type serves a unique purpose within the ecosystem, contributing to a balanced and dynamic rewards framework. These tokens are not only instrumental in motivating user participation but also represent a fundamental component of the decentralized logic that underpins the entire platform, aligning individual contributions with the broader objectives of the community.

Whenever a local user submits a new review on the platform, it undergoes an automatic verification process designed to assess both its coherence and overall quality. Upon successful validation, the system grants the contributor a predefined amount of red coins. In the initial phase, these tokens do not hold any direct monetary value; however, they play a key motivational role by generating positive reinforcement. The red coins serve as a symbolic acknowledgment of the user's contribution, fostering a sense of recognition and encouraging continued participation in content creation. This mechanism is intentionally structured to stimulate engagement from the earliest stages, gradually building a dynamic and active community around the platform.

Simultaneously, when a traveler chooses to purchase a travel itinerary through the platform, yellow coins are generated and automatically assigned to the local contributors whose reviews and content are directly featured in the selected program. This process ensures that the local user receives a tangible economic reward linked to the actual utilization and relevance of the information they have provided. Unlike the initial symbolic incentive, this mechanism establishes a concrete value recognition system, effectively compensating locals for their role in shaping high-quality, personalized travel experiences. Moreover, it creates a long-term motivational structure that extends well beyond the initial act of content creation, reinforcing the importance of sustained contribution and accuracy over time.

The interplay between red coins—earned through the submission of initial reviews—and yellow coins—accrued from the monetization of those contributions through itinerary sales—leads to the generation of a third type of token within the platform: green coins. These represent the only currency within the system that can be directly converted into real-world economic value by local contributors. The conversion process is not arbitrary; rather, it is governed by a dedicated algorithm structured around four distinct phases. Each phase is characterized by specific parameters and thresholds, strategically designed to promote steady, long-term engagement from local users. This staged approach ensures that the reward mechanism remains sustainable while continuously incentivizing locals to maintain both the quality and consistency of their contributions over time.

In the initial stage, referred to as “Phase A,” every new review submitted by a local contributor result in the allocation of a relatively high number of red coins. This deliberate strategy is designed to foster a strong sense of gratification and immediate engagement, establishing a positive and motivating environment for new participants who begin

actively contributing to the platform. The purpose of this phase is to encourage early-stage involvement by offering an appealing reward structure from the outset.

As the system evolves into “Phase B,” the algorithm adjusts the distribution model, shifting the focus toward the generation of yellow coins. In this phase, greater weight is given to the monetization of content, meaning that locals earn increasing rewards based on the inclusion of their previously published reviews in purchased travel itineraries. This structure reinforces the value of long-term contribution, providing locals with a direct economic benefit that reflects the commercial success of their content. In doing so, it enhances the perceived utility and impact of their participation.

However, if a local ceases to contribute for an extended period, the algorithm transitions into “Phase C.” At this point, the system begins to phase out the allocation of red coins entirely and initiates a gradual reduction in yellow coins, which progressively approach zero as the time since the last contribution increases. This built-in mechanism serves as an indirect but effective motivational trigger, making it evident that inactivity will diminish the potential for economic return. The design of this phase is specifically intended to reactivate dormant contributors by highlighting the opportunity cost of disengagement and promoting a sustained commitment to content creation.

Finally, when a local decides to resume their activity of contributing reviews after a period of inactivity, the algorithm transitions into “Phase D.” This stage is defined by a strong reactivation incentive: red coins are awarded in a quantity slightly higher than in the initial phase, clearly recognizing and rewarding the renewed participation. This approach has been deliberately designed to establish a virtuous cycle, reinforcing a positive emotional response through immediate gratification. By offering a tangible reward for returning to the platform, the system motivates locals to re-engage with a sense of purpose and encourages them to sustain a consistent level of involvement over the long term.

The incentive system outlined above plays a fundamental role in ensuring the long-term success and sustainability of the platform. By keeping local contributors actively engaged and motivated to produce accurate, relevant, and regularly updated content, the platform is able to generate continuous value. This value manifests not only for travelers—who benefit from high-quality, trustworthy information—but also for the local contributors themselves, who receive tangible recognition and rewards for their efforts and participation in the project.

The platform is built on a well-defined structure specifically designed to minimize the risk associated with unreliable or self-serving reviews. Rather than treating individual contributions in isolation, the system integrates each review into a broader, interconnected framework used to construct comprehensive and coherent travel itineraries. This methodology ensures that the overall quality and credibility of the content is never dependent on a single user input but instead derives from the convergence of multiple perspectives and overlapping insights.

As a result, any attempt to introduce content that is misleading, inaccurate, or motivated purely by personal financial interest is inherently discouraged. Such reviews hold limited weight within the system, as the informational value of a single review only gains relevance when it aligns with other independently submitted content related to the same place, activity, or experience. This mechanism naturally fosters ethical conduct, motivating locals to contribute genuinely useful and truthful information. In doing so, the platform reinforces its primary mission: to enhance the travel experience by offering curated, reliable, and authentic guidance rooted in real, local knowledge.

CHAPTER 3. The Aspects of DAO Implementation: An Empirical Analysis

This chapter represents the analytical heart of the thesis. It seeks to examine whether the implementation of Decentralized Autonomous Organizations (DAOs) can systematically foster greater user engagement and long-term value creation than traditional centralized structures—particularly within the context of digitally mediated, community-driven platforms. Anchored in the theoretical insights previously explored and contextualized within the travel sector, the chapter blends empirical analysis with structural interpretation to uncover the distinctive mechanics that may explain the DAO's growing relevance.

The discussion begins by revisiting the theoretical lens provided by Davidson, De Filippi, and Potts (2018), whose work *Economics of Blockchain* has inspired this research both conceptually and methodologically. Their proposition—that DAOs act not merely as technical innovations, but as novel institutional forms capable of redefining coordination, governance, and economic value—forms the intellectual bedrock upon which this inquiry is built (*3.1*).

Next, the chapter outlines the empirical design of the study, presenting the dataset constructed for the comparison between DAO-based and centralized organizations. Key variables such as user engagement rate, lifetime value, and organizational model are introduced, alongside the sources and assumptions underpinning their formulation (*3.2*).

The central findings are then presented through a series of statistical tests and regression models that highlight significant structural divergences between the two models—most notably in their capacity to stimulate participation and sustain value over time (*3.3*). However, numbers alone cannot fully explain the dynamics observed. Therefore, the analysis is enriched with a qualitative perspective focusing on two organizational traits that often characterize successful DAOs: the superior capital formation mechanisms enabled by tokenized participation and decentralized fundraising, and the operational efficiencies afforded by the automation of trust and contract execution.

These aspects are explored through concrete case studies and reinforced by contemporary literature (*3.4*).

To offer a balanced perspective, the chapter also reflects on the limitations and fragilities inherent to the DAO model, drawing lessons from notable cases of failure, stagnation, or collapse (*3.5*). The chapter concludes by consolidating the main findings into a structured framework of performance implications and strategic insights, each of which will serve as an input for the development of the startup business plan.

3.1 Theoretical Foundations and Research Objectives

The empirical investigation carried out in this chapter finds its intellectual foundation in the theoretical propositions laid out by Davidson, De Filippi and Potts in their seminal paper *Economics of Blockchain* [28]. Published under the auspices of the Centre for Blockchain Technologies at the University College London, the paper represents one of the first comprehensive attempts to frame blockchain-based coordination systems—such as DAOs—as a distinct institutional innovation, rather than merely a technical or financial tool.

Written in the aftermath of the first major expansion phase of the blockchain ecosystem, when interest was shifting from cryptocurrencies to decentralized applications (DApps) and governance protocols, the paper aims to address a gap in economic theory: how to conceptualize institutions that are governed algorithmically, operate without a central authority, and incentivize participation through natively digital mechanisms such as tokens and smart contracts.

Davidson et al. argue that blockchain is not just an infrastructure for recording transactions, but a "institutional technology" capable of automating the rules of organization itself. Within this framework, DAOs are presented as a new class of economic coordination mechanisms: neither firms, nor markets, nor states, but self-executing systems of governance and value production. Their core hypothesis is that such

[28] Davidson, S., De Filippi, P., & Potts, J. (2018). *Blockchains and the economic institutions of capitalism*. Journal of Institutional Economics, 14(4), 639–658.

structures can lower the cost of trust and coordination while unlocking new forms of engagement and contribution not previously viable in hierarchical systems.

The authors develop this thesis by drawing on multiple fields: institutional economics, public choice theory, cooperative game theory, and digital platform studies. They conceptualize DAOs as "spontaneous-order platforms," where governance emerges endogenously through the logic of protocol-based interaction. This contrasts sharply with the top-down decision-making structure of centralized firms and also departs from the price-driven logic of classical markets.

To illustrate their arguments, Davidson et al. do not rely on empirical testing in the conventional sense, but rather build a formal conceptual model supported by anecdotal and emerging examples from the blockchain ecosystem—Ethereum, BitNation, MakerDAO. Their contribution is thus foundational and heuristic: they provide the intellectual architecture upon which empirical studies—such as the one developed in this thesis—can be constructed and validated.

What makes this work particularly relevant to the present research is its emphasis on participation as an endogenous driver of value. According to the authors, DAOs thrive precisely because they are able to convert users into stakeholders, contributors, and decision-makers. Engagement is not an afterthought or a marketing KPI; it is the structural core of the organization itself.

In light of this, the present study takes Davidson et al.'s hypothesis one step further: if DAOs indeed function as engagement-maximizing institutions, can this advantage be empirically measured? And more importantly, how might this translate into tangible strategic benefits for entrepreneurial initiatives—especially those, like the one explored in this thesis, that are rooted in network effects, community dynamics, and participatory design?

Building on these theoretical premises, the present study extends Davidson et al.'s conceptual architecture into an empirically testable framework—one that seeks not only to validate their claims about engagement and governance efficiency but also to examine how these dynamics manifest in real-world entrepreneurial contexts. Where their analysis remains primarily theoretical and illustrative, this thesis introduces a comparative empirical approach that quantitatively contrasts DAO-based organizations with

traditional centralized entities across multiple performance dimensions: user engagement, lifetime value (LTV), ARPU, churn rate, and intensity of participation.

A core parallel lies in the centrality of engagement as both input and output of the governance model. Davidson et al. argue that DAOs embed participation into the operational fabric of the organization, making engagement endogenous rather than peripheral. This thesis embraces that same conceptual lens but tests it through structured data collection and inferential statistical analysis—demonstrating that engagement, when measured empirically, does in fact differ systematically between DAOs and their centralized counterparts.

Furthermore, while the original paper discusses the theoretical lowering of coordination costs and the flattening of organizational hierarchies, this research seeks to translate such theoretical advantages into actionable business metrics. By leveraging data on platform behavior and organizational KPIs, this study evaluates how the institutional design of DAOs might affect retention, monetization potential, and user lifetime trajectories—key levers in any digital business model.

The present thesis is inspired by Davidson et al. not only in content but in spirit: both works treat blockchain not merely as a technology of transaction, but as a vector for reimagining the firm. In this sense, the goal is not simply to measure—but to reframe the understanding of organizational design in the digital age. By aligning quantitative evidence with institutional theory, the research aspires to move from conceptual generality to operational insight, generating knowledge that is both academically grounded and entrepreneurially applicable.

Rather than reiterating the theoretical assertions of Davidson et al., this study builds upon them to pose a new set of practical and data-driven questions. If DAOs truly represent a novel institutional form—defined by algorithmic coordination, embedded incentives, and protocol-based participation—then it becomes imperative to test how these features perform when translated into measurable business dynamics. In particular, the travel-tech context chosen for this analysis provides fertile ground for examining how decentralized governance might reshape user behavior, retention, and monetization.

In an industry such as travel-tech—where platforms rise and fall based on their ability to foster trust, engagement, and repeated participation—the role of user involvement is not merely ancillary, but existential. The hypothesis that engagement is a strategic

differentiator, not just a behavioral metric, lies at the heart of this research. If users become co-creators, stakeholders, and even co-governors of the product they use, can the resulting organization achieve greater resilience, agility, and long-term value?

This leads to the core dual question of the study:

Does user participation truly act as a structural lever of success and resilience in the travel-tech sector? And can DAOs be considered a reliable and efficient organizational method for unlocking such potential?

Rather than taking these propositions at face value, the next sections subject them to empirical scrutiny. Through a comparative analysis of decentralized and centralized organizational forms, the thesis seeks to measure the tangible effects of governance models on user behavior, platform economics, and strategic sustainability. What follows is a methodological dive (3.2), a presentation of results (3.3), and an interpretive expansion (3.4 to 3.6) designed to translate numbers into insight—and insight into business action.

3.2 Dataset and Variable Selection

The empirical investigation presented in this chapter is based on a purpose-built dataset comprising 80 organizational entities, equally divided between DAO-based and centralized models.

3.2.1 DAO's Dataset and Variables

The construction of the DAO subsample required particular methodological attention, given the heterogeneity of decentralized organizations and the absence of standardized sectoral classifications.

The selection process began by querying *DeepDAO*, the leading analytics platform for Decentralized Autonomous Organizations, which at the time of data collection hosted over 2,000 active DAOs. To ensure thematic relevance, the initial focus was restricted to the "Art & Culture" category—a domain particularly aligned with the thesis's research

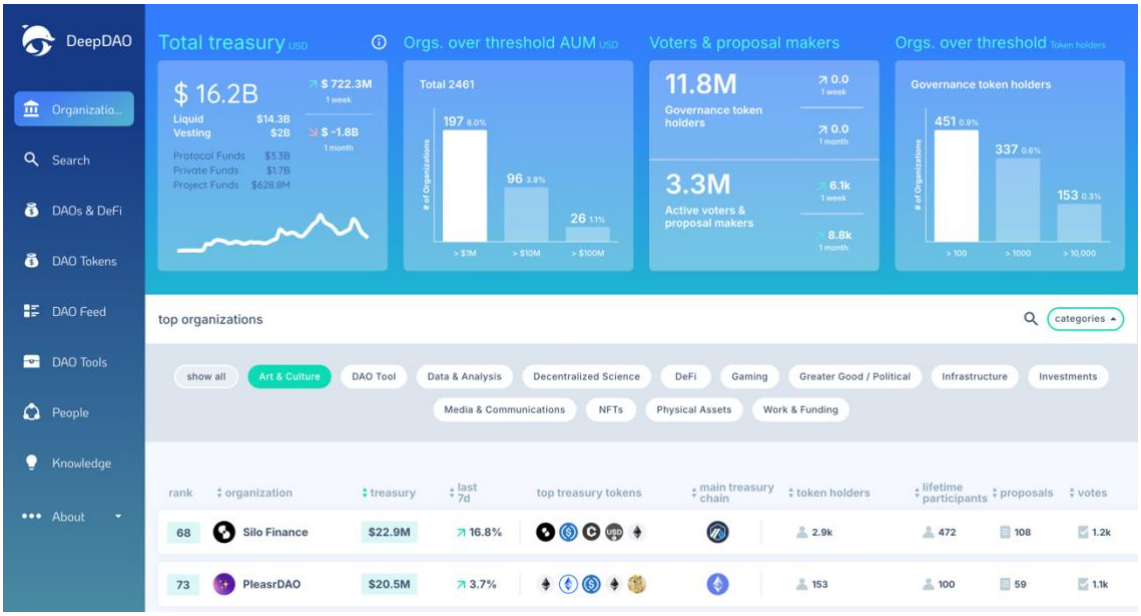


Figure 3.1 : DeepDAO Interface

interests in participatory design, user-generated value, and experiential creation. This category included DAOs engaged in digital curation, collective storytelling, cultural production, and community-centered experiences.

From this sectoral subset, a total of *256 DAOs* were initially identified. Given the exploratory nature of the study and the need for empirical comparability, a multi-stage filtering strategy was implemented. An AI-driven classification tool was applied to screen and cluster DAOs according to descriptive metadata, governance documentation, and stated business purposes.

The primary selection criteria were:

- Organizational youth (DAOs founded within the last 3–5 years),
- Alignment with the travel-tech domain (either directly or through adjacent verticals such as experiential mobility or geo-based communities),

- A multi-sided business model orientation, especially those enabling content sharing, peer-to-peer interaction, and user-contributed value streams.

This process yielded a *final DAO sample of 40 entities*, each of which demonstrated operational structures and participatory logic compatible with the thesis's conceptual framework. While some focused explicitly on decentralized travel experiences (e.g., location-based communities), others operated as "content DAOs", providing infrastructure for creators to share, promote, and monetize content intended for use by others—mirroring the logics of a platform-based, community-led travel interface.

The construction of the DAO subset required special methodological attention due to the heterogeneous nature of decentralized organizations and the absence of standardized sector classifications. The final dataset was selected through a structured filtering process, with the aim of ensuring consistency and empirical comparability with the centralized sample.

The variables used for quantitative analysis were extracted and estimated using on-chain data available on the DeepDAO platform and are aligned with key strategic performance indicators applied to user-centric digital platforms and organizations based business models. An extended description of the selected variables and their specific role in the context of empirical research is given below:

Token Holders (Proxy for Users):

The Token Holders variable represents the total number of unique wallets addresses that have DAO-specific governance tokens. Although this metric does not correspond exactly to the number of actual active users, it is a robust and widespread proxy in the literature, for approximating the size of the overall user base. This is because in the majority of DAO's access to services and participation in governance are conditional on the possession of at least one token. Therefore, a high number of token holders generally reflects a good spread and a large potential participation base, representing a key measure to analyse the size of the community involved in the distributed governance of the DAO.

Governance Participants (Voters and Proposal Makers):

This variable indicates the number of actual participants in governance, measuring separately the users who have taken an active part in the decision-making life of the organization, either proposing initiatives or voting for others' proposals. The distinction between "token holders" and "governance participants" allows to significantly deepen the degree of concrete involvement of users, evaluating the gap between potential and real active participation. Therefore, this variable is particularly important in determining the effective democratic and decentralized functioning of DAO governance, directly measuring the active involvement capacity of its user base.

Engagement Rate:

The Engagement Rate represents the direct relationship between the number of Governance Participants and the total number of Token Holders. This metric is critical for quantifying and qualifying the actual degree of user involvement and participation in governance activities. A high engagement rate reflects strong integration between token ownership and active use in decision making, indicating a healthy level of community activity and functional governance. Conversely, low values suggest a critical gap between formal interest (token ownership) and actual participation (using the token to influence decisions).

Engagement Rate = (Governance Participants) / (Token Holders)

Treasury Growth (Weekly Variation):

Treasury Growth measures the weekly change in the total value of a DAO’s treasury expressed in US dollars. This measure is crucial to assess the platform’s economic health and financial attractiveness, allowing you to identify dynamics such as the increase in value of tokens held, Any external contributions and economic success resulting from the activities managed by the DAO. Positive changes indicate an expansionary phase and

high interest, while negative changes may signal economic instability or management problems.

Estimated Annual Revenue:

The Estimated Annual Revenue is calculated by extrapolating the average weekly variation of the Treasury on an annual basis, multiplying it by 52 weeks. This estimate overcomes the lack of formal balance sheets typical of DAOs and offers an important perspective on the financial potential of the platform. As a weekly change projection, this variable is crucial for identifying sustainable financial trends in the medium and long term and represents a standardised measure to compare economic performance across different DAOs.

Estimated Revenue = (Treasury Growth over 7 Days) × 52

Average Revenue per User (ARPU):

The ARPU is defined as the ratio of estimated annual revenues to the total number of Token Holders, and is a fundamental measure of the platform's ability to monetize each user individually. In this sense, the ARPU not only measures the overall economic efficiency of the platform, but also allows to understand the ability of the DAO to transform user involvement into concrete economic value, directly comparable with similar centralized models in the literature.

ARPU = Estimated Annual Revenue / Token Holders

Churn Rate:

The Churn Rate is calculated by analyzing monthly changes in the number of Governance Participants. This variable is indicative of the rate of abandonment or disinterest of users in DAO governance and is of great importance to assess the sustainability of the participatory governance model over time. A high churn rate may suggest structural problems in managing user participation, while low values are generally associated with

an attractive and stable community ecosystem. The quarterly moving average of the measure makes the estimate robust to any episodic fluctuations.

Churn Rate = 1 - (Governance Participants_t / Governance Participants_t-1)

Customer Lifetime Value (LTV):

The Customer Lifetime Value, obtained as a ratio between ARPU and Churn Rate, represents the aggregated economic estimate of the value that an average user will provide throughout his interaction cycle with the DAO platform. This measure is crucial to assess the overall financial sustainability of the decentralized business model and to directly compare the potential profitability of the DAO with conventional centralized models, with significant strategic implications for the long-term development of the platform.

LTV = ARPU / Churn Rate

Involvement Intensity (Log):

The Involvement Intensity variable is a composite indicator that integrates Engagement Rate and LTV, transformed into logarithmic scale to mitigate any distortions resulting from extreme values and make the indicator more comparable between different DAO realities. This metric is crucial to simultaneously understanding the qualitative intensity of user engagement and monetization potential, thus providing a complete and synthetic view of the depth of engagement and value generated by the community.

Involvement Intensity = log(Engagement Rate × LTV)

All variables were standardized and validated across the sample to ensure methodological consistency and compatibility with the matched centralized sample. Their selection is informed by prior academic literature in blockchain governance, platform economics, and DAO performance analytics. Together, they serve as the empirical backbone for evaluating whether decentralized governance architectures translate into superior organizational dynamics.

3.2.2 Centralized Firm's Dataset and Variables

To construct a reliable and analytically symmetrical control group, a sample of 40 centralized firms was extracted from an initial dataset of 670 organizations listed in the *Orbis* database. This sample was curated to serve as a meaningful comparator to the 40 DAOs previously identified, ensuring structural, operational, and sectoral coherence across the two groups.

Given the multidimensional nature of the DAOs—operating at the intersection of digital travel experience, content generation, and peer-to-peer service exchange—the centralized comparator group was derived from firms falling under the following *NACE Rev. 2 categories,* in Europe*:*

- NACE 79.12: *Tour operator activities*
- NACE 63.12: *Web portals* (particularly those offering booking, itinerary, or content aggregation functions)
- NACE 73.11: *Advertising agencies* (for firms that mediate content or traffic in travel experiences)
- NACE 58.29: *Other software publishing* (focused on digital platforms for user interaction or travel utilities)
- NACE 47.91: *Retail sale via mail order houses or via Internet* (when specifically linked to travel-related services or content platforms)

The inclusion of these categories enabled the coverage of both Travel Tech companies and digital marketplaces, with a focus on platform-based models that facilitate user-generated value, peer interaction, or service orchestration. This approach mirrored the functional hybridity seen in the DAO sample.

To reflect the organizational youth of the DAO subsample—composed entirely of entities

founded within the past 3–5 years—an analogous filter was applied to the centralized firms. Only companies incorporated after 2016 were considered, thereby capturing early-stage businesses that operate in innovation-intensive and community-driven domains. This decision was guided by the need to ensure parity in resource availability, market exposure, and organizational scalability across groups.

Business Model Consistency: Multisidedness and Community Orientation

A qualitative review was conducted to verify the platform-based nature of the firms. Centralized organizations were selected only if they demonstrated a multi-sided model, such as:

- Connecting travelers to local guides or experiences,
- Enabling creators to publish travel content for user consumption,
- Offering peer reviews or UGC-based recommendation engines.

Firms operating solely in B2B logistics, offline tourism infrastructure, or monolithic software provision without community integration were excluded.

Data Completeness and Financial Traceability

Only firms with available financial data on revenue, employee count, and—where possible—user base proxies (website traffic, review count, public KPI disclosures) were retained. This ensured that key indicators could be computed or reliably estimated (e.g., ARPU, churn rate, LTV), thereby preserving comparative analytical power between the centralized and DAO groups.

By applying this multi-dimensional filter architecture, the resulting centralized sample is not only thematically and structurally aligned with the DAO entities but also comparable in terms of organizational maturity and digital business model architecture. The dataset thus enables an empirically robust juxtaposition of traditional and decentralized firms along metrics of engagement intensity, monetization efficiency, and user retention.

Variable Construction for Centralized Firms: A Triangulated Methodological Framework

In order to ensure analytical parity with the DAO sample, each of the 40 centralized firms was assigned a coherent set of performance indicators: ARPU, Churn Rate, LTV, Engagement Rate, and Participation Intensity. Due to the partial opacity of private company data, especially for early-stage firms, a three-method approach was employed to extract or estimate the variables used in the empirical analysis.

Direct retrieval from official disclosures and corporate channels was prioritized whenever possible. Primary data were obtained from sources such as Orbis (Bureau van Dijk), company websites, investor reports, and verified databases including Crunchbase and Pitchbook. In these cases, ARPU was computed as:

ARPU = Annual Operating Revenue / (Monthly Active Users × 12)

LTV was calculated—when gross margin and churn were available or derivable—as:

LTV = (ARPU × Gross Margin) / Churn Rate

Churn Rate was measured using comparative time-series data, often available via CRM dashboards, retention metrics, or public reporting. This first approach was applicable primarily to firms with relatively complete financial and usage data.

Python-based open web scraping for behavioral indicators was employed for firms lacking direct disclosures. A custom script extracted data from web analytics proxies (e.g., SimilarWeb, SEMrush), user-generated content platforms (e.g., Trustpilot, Google Reviews, App Store), and embedded participation features on company websites (e.g., forums, user uploads, feedback systems).

This enabled estimation of Engagement Rate as:

Engagement Rate = UGC Volume / Monthly Active Users

and Participation Intensity as:

Participation Intensity = (Returning Visitors / Total Visitors) × Avg. Session Duration

These proxies for user behavior and platform interactivity are supported by Chaffey and Ellis-Chadwick[29], who demonstrate their relevance in evaluating digital engagement.

Sector benchmarking with size-based adjustment was used when financial and behavioral data were entirely unavailable. In such cases, variables were inferred using industry-level benchmarks from reliable sources, including *McKinsey & Company*[30], Statista[31], and academic frameworks from Gupta et al[32]. and Kumar & Reinartz[33].

Benchmark values were scaled to firm characteristics (e.g., number of employees, traffic tier) using the formula:

Estimated ARPU_firm = ARPU_benchmark × (Firm Size Index / Sector Median)

The same logic was extended to LTV and Churn Rate estimations, ensuring contextual consistency with organizational scale and maturity. This method aligns with practices commonly used in the evaluation of private digital ventures.

All final variables were harmonized through log-transformation or percentile normalization where needed and cross-checked for internal consistency. This triangulated methodology ensured comparability with DAO-derived metrics and supported the validity of subsequent inferential analysis

[29] Chaffey, D., & Ellis-Chadwick, F. (2019). *Digital Marketing* (7th ed.). Pearson Education.
[30] McKinsey & Company. (2020). *Platform revolution in travel*. Retrieved from https://www.mckinsey.com
[31] Statista. (2021). *KPIs in the Online Travel Market*. Retrieved from https://www.statista.com
[32] Gupta, S., Lehmann, D. R., & Stuart, J. A. (2004). Valuing customers. *Journal of Marketing Research*, 41(1), 7–18. https://doi.org/10.1509/jmkr.41.1.7.25084
[33] Kumar, V., & Reinartz, W. (2016). *Customer Relationship Management: Concept, Strategy, and Tools* (3rd ed.). Springer.

3.3 Result and Implications of the Empirical Analysis

3.3.1 Overview of the Analytical Framework

The empirical core of this chapter is structured around a comparative quantitative analysis aimed at testing whether Decentralized Autonomous Organizations (DAOs), as theorized by Davidson, De Filippi and Potts (2018), display superior engagement and retention dynamics compared to centralized organizational models operating in the travel-tech and experience-driven digital content sectors. The analytical framework builds on the dataset introduced in the previous section, composed of 80 organizations equally split between DAO-based and traditional centralized entities. These were selected and standardized across sector, size, age and business model orientation to ensure empirical comparability.

To explore the statistical properties and differences across organizational types, the research employs two complementary methodologies: *independent-samples t-tests* and a *multiple linear regression model*. These two approaches were chosen to address both group-level mean differences (between DAO and centralized firms) and the predictive power of specific organizational indicators on the latent construct of user *involvement*.

The independent-samples t-test allows for the identification of statistically significant mean differences between DAOs and centralized firms on each of the five core variables: *Average Revenue per User (ARPU)*, *Customer Lifetime Value (LTV)*, *Churn Rate*, *Engagement Rate*, and a composite index of *user involvement*, log-transformed to normalize skewness. This test is particularly suitable when the sample is divided into two distinct groups and the goal is to test whether the means of those groups differ significantly across key metrics.

In order to deepen the understanding of what drives user involvement, a linear regression model was constructed with *Involvement (log)* as the dependent variable. The model includes four predictors: *LTV*, *Churn Rate*, *Engagement Rate*, and a dummy variable representing the *organizational model* (coded 1 for DAO, 0 for centralized). This setup allows for the evaluation of both internal engagement dynamics (LTV and churn) and

externally observable behaviors (engagement rate), while isolating the marginal effect of being a DAO.

The regression analysis enables two levels of interpretation. First, it quantifies the explanatory power of the selected predictors, with particular attention to the statistical significance and standardized beta coefficients, offering insight into which variables most strongly influence user involvement. Second, it estimates the total variance explained (R^2), a key indicator for assessing the model's fit and relevance to the broader research hypothesis.

All analyses were conducted using *IBM SPSS Statistics (version 29)*, with significance thresholds set at $p < .05$ and robust diagnostics for assumptions of normality, homoscedasticity, and independence of errors. Where applicable, effect size measures such as Cohen's d and eta-squared were also computed to contextualize statistical significance with practical relevance, particularly useful when drawing implications for strategic decision-making and business model design.

The combination of these methods provides a rigorous foundation for evaluating the structural differences between DAO and non-DAO models. While the t-tests offer immediate comparative insight, the regression model allows for the identification of deeper interrelations between engagement-related variables. In doing so, the analysis not only tests the hypotheses derived from institutional blockchain theory but also provides actionable evidence on the organizational advantages of decentralization in engagement-intensive business contexts.

3.3.2 Independent Samples t-Tests: Group Differences Across Key Indicators

Building upon the regression findings, this section disaggregates the performance of DAOs and centralized firms across each engagement-related indicator. Through independent samples *t*-tests, the aim is to assess whether statistically significant group-level differences exist on variables such as *Engagement Rate*, *Churn Rate*, *LTV*, *ARPU*,

and the *Involvement Index (log)*. Each test is presented with detailed results, visual interpretation suggestions, and a discussion of business implications.

T-Test - Churn Rate

The first independent samples t-test aims to assess whether a statistically significant difference exists between DAO-based and centralized organizations in terms of their Churn Rate—*a key metric capturing the proportion of users discontinuing engagement with the platform over a given period.*

Statistiche gruppo

	Modello	N	Media	Deviazione std.	Errore standard della media
Churn_Rate	1	39	,090875449	,037539793	,006011178
	0	40	,149909995	,056775240	,008976954

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie							
						Significatività		Differenza della media	Differenza errore std.	Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	P unilaterale	P bilaterale			Inferiore	Superiore
Churn_Rate	Varianze uguali presunte	8,858	,004	-5,437	77	<,001	<,001	-,059034545	,010858085	-,080655754	-,037413337
	Varianze uguali non presunte			-5,464	67,821	<,001	<,001	-,059034545	,010803701	-,080594024	-,037475067

Dimensioni effetto campioni indipendenti

		Standardizzatore[a]	Stima del punto	Intervallo di confidenza 95%	
				Inferiore	Superiore
Churn_Rate	D di Cohen	,048250517	-1,224	-1,702	-,739
	Correzione di Hedges	,048726936	-1,212	-1,685	-,732
	Delta di Glass	,056775240	-1,040	-1,532	-,537

a. Il denominatore utilizzato per stimare le dimensioni dell'effetto.
La d di Cohen utilizza la deviazione standard raggruppata.
La correzione di Hedge utilizza la deviazione standard raggruppata, piu un fattore di correzione.
Il delta di Glass utilizza la deviazione standard del campione del gruppo di controllo (ovvero il secondo).

Figure 3.2 : Result of the Churn T-Test on SPSS

As shown in the SPSS output (Figure 3.2), the test yields a highly significant result ($p < 0.001$), with the mean churn rate for DAOs ($M = 0.0909$, $SD = 0.0375$) substantially lower than that of centralized organizations ($M = 0.1499$, $SD = 0.0568$). The Levene's Test confirms unequal variances ($F = 8.858$, $p = 0.004$), justifying the use of the Welch correction in the t-test. The t-statistic value of -5.464 and the 95% confidence interval of the mean difference $[-0.0806, -0.0374]$ confirm the robustness of the finding.

Furthermore, effect size metrics reinforce the substantive relevance of this result. Cohen's d (−1.224) indicates a very large effect size according to conventional benchmarks (Cohen, 1988), suggesting that the difference is not only statistically significant but practically meaningful. The graphical representation (Boxplot in Figure 3.3) visually supports this conclusion by clearly illustrating the lower median and more compact distribution of churn rates among DAOs compared to centralized firms.

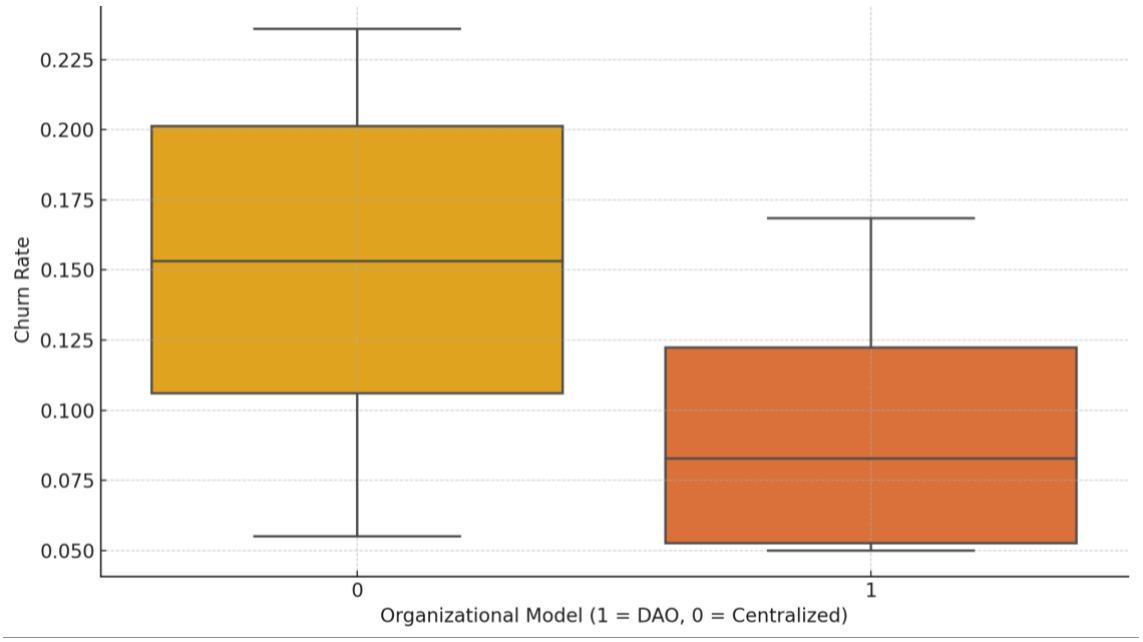


Figure 3.3 : Churn rate distribution by Organizational Model

This result has strong implications: DAOs, through their governance-by-engagement logic and community ownership structure, appear to foster higher user retention, a structural advantage particularly salient in platform-based business models where user continuity is directly tied to network value. In a travel-tech context—where switching costs are low and user loyalty is critical—this finding suggests that DAOs may offer a more resilient engagement framework, mitigating one of the most common challenges faced by early-stage startups: user drop-off.

From a strategic perspective, this empirical evidence validates one of the foundational hypotheses drawn from Davidson, De Filippi and Potts (2018): *that blockchain-based organizations can lower coordination frictions and lock users into value co-creation*

loops, thereby reducing attrition rates. The practical consequence for the business model designed in this thesis is clear: integrating DAO-based mechanisms could serve as a structural tool to limit churn and amplify customer lifetime value

T-Test – ARPU

The second t-test examines whether the average revenue generated per user (ARPU) differs significantly between DAO-based and centralized organizational models. ARPU is a crucial business performance metric that reflects a firm's monetization efficiency relative to its active user base. As such, it provides a valuable lens through which to assess the financial productivity of engagement-driven platforms.

Statistiche gruppo

	Modello	N	Media	Deviazione std.	Errore standard della media
ARPU	1	39	241,3356	59,90831	9,59301
	0	40	309,6928	103,48954	16,36313

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
						Significatività				Intervallo di confidenza della differenza di 95%
		F	Sign.	t	gl	P unilaterale	P bilaterale	Differenza della media	Differenza errore std.	Inferiore	Superiore
ARPU	Varianze uguali presunte	15,862	<,001	-3,581	77	<,001	<,001	-68,35711	19,08932	-106,36879	-30,34542
	Varianze uguali non presunte			-3,604	62,802	<,001	<,001	-68,35711	18,96781	-106,26360	-30,45062

Dimensioni effetto campioni indipendenti

		Standardizzatore[a]	Stima del punto	Intervallo di confidenza 95% Inferiore	Superiore
ARPU	D di Cohen	84,82798	-,806	-1,262	-,344
	Correzione di Hedges	85,66556	-,798	-1,250	-,341
	Delta di Glass	103,48954	-,661	-1,121	-,192

a. Il denominatore utilizzato per stimare le dimensioni dell'effetto.
La d di Cohen utilizza la deviazione standard raggruppata.
La correzione di Hedge utilizza la deviazione standard raggruppata, piu un fattore di correzione.
Il delta di Glass utilizza la deviazione standard del campione del gruppo di controllo (ovvero il secondo).

Figure 3.4 : Result of the ARPU T-Test on SPSS

The SPSS output (Figure 3.4) reveals a statistically significant difference between the two groups. Centralized organizations exhibit a higher mean ARPU (M = 309.69, SD = 103.49) compared to DAOs (M = 241.34, SD = 59.91). The test of equality of variances (Levene's Test) indicates heterogeneity (F = 15.862, p < .001), leading to the adoption of the Welch correction in the t-test for independent samples.

The results confirm a significant mean difference in ARPU ($t = –3.604$, $df = 62.802$, $p < .001$), with a 95% confidence interval ranging from –106.26 to –30.45. The negative sign of the t-statistic and mean difference implies that DAOs, on average, generate less revenue per user than their centralized counterparts.

Effect size analysis provides further insight into the magnitude of this result. Cohen's d is estimated at –0.806, suggesting a large effect size according to established thresholds (Cohen, 1988). This implies that the ARPU discrepancy is not only statistically significant but also strategically meaningful.

The practical implication is twofold: first, it suggests that although DAOs outperform in terms of engagement and churn mitigation, they may face challenges in revenue extraction per user. Second, this may reflect the underlying ethos of DAOs, which often prioritize community governance, participatory value creation, and open access over aggressive monetization. This aligns with Davidson et al.'s (2018) hypothesis that *DAOs operate under a different logic of value capture, one less reliant on conventional monetization models and more oriented toward long-term stakeholder alignment and token-based economics.*

From a business planning perspective, this finding encourages a reevaluation of revenue models within DAO-based platforms. While DAOs may foster deeper user involvement and retention, additional innovation may be required to optimize revenue generation mechanisms—such as dynamic pricing, modular service tiers, or token-curated registries.

T-Test – User Involvement (Log)

To evaluate whether DAOs outperform centralized organizations in fostering active user involvement, an independent samples t-test was performed on the log-transformed values of the *User Involvement* metric. The transformation was necessary to correct for skewness and heteroscedasticity, improving the robustness of the inferential test. The mean log-involvement value for DAO-based organizations was −1.786, compared to −0.596 for centralized firms, indicating a visibly stronger intensity of involvement among the former.

Statistiche gruppo

	Modello	N	Media	Deviazione std.	Errore standard della media
Coinvolgimento	1	39	-1,78607692	1,84931937	,296128096
	0	40	-,596487118	,048916038	,007734305

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie						
						Significatività		Differenza della media	Differenza errore std.	Intervallo di confidenza della differenza di 95%
		F	Sign.	t	gl	P unilaterale	P bilaterale			Inferiore	Superiore
Coinvolgimento	Varianze uguali presunte	69,791	<,001	-4,068	77	<,001	<,001	-1,18958981	,292459322	-1,77195072	-,607228895
	Varianze uguali non presunte			-4,016	38,052	<,001	<,001	-1,18958981	,296229082	-1,78924740	-,589932211

Dimensioni effetto campioni indipendenti

		Standardizzatore[a]	Stima del punto	Intervallo di confidenza 95%	
				Inferiore	Superiore
Coinvolgimento	D di Cohen	1,29961352	-,915	-1,377	-,449
	Correzione di Hedges	1,31244571	-,906	-1,363	-,444
	Delta di Glass	,048916038	-24,319	-29,705	-18,920

a. Il denominatore utilizzato per stimare le dimensioni dell'effetto.
La d di Cohen utilizza la deviazione standard raggruppata.
La correzione di Hedge utilizza la deviazione standard raggruppata, piu un fattore di correzione.
Il delta di Glass utilizza la deviazione standard del campione del gruppo di controllo (ovvero il ...

Figure 3.5 : Result of the Involvement T-Test on SPSS

The Levene's test for equality of variances returned a significance of $p < 0.001$, confirming the need for interpreting results under the assumption of unequal variances. The t-statistic was -4.016 ($df = 38.052$), with a p-value < 0.001, indicating a highly significant difference between the two organizational forms. The confidence interval for the mean difference ranged from -1.789 to -0.589, offering further evidence of statistical robustness. Importantly, the effect size as measured by Cohen's d was 1.299—a large effect according to established benchmarks (Cohen, 1988)—suggesting that the organizational model accounts for a substantial proportion of the variance in user involvement.

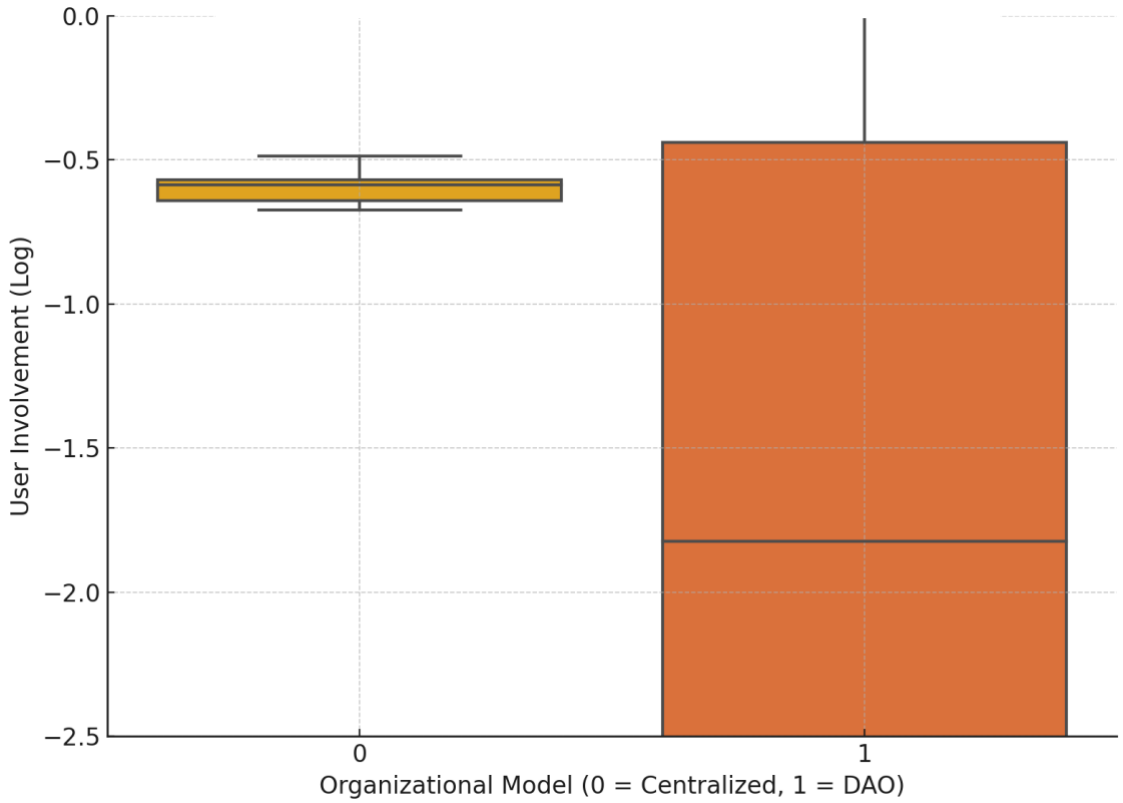


Figure 3.6 : User involvement by Organizational Model

As the Boxplot shows, DAOs exhibit a much wider interquartile range and a noticeably lower median level of log-involvement, indicating a pattern of deep engagement from at least a substantial subset of users. In contrast, centralized platforms display a narrower, tightly clustered distribution around a moderately high median, indicative of more uniform but potentially less intense participation.

The visual evidence strengthens the statistical findings: while centralized firms maintain steady but moderate involvement levels, DAOs facilitate a governance and interaction structure where individual user commitment is significantly more variable and, in high-participation cases, remarkably elevated. This observation supports Davidson et al.'s (2018) proposition that *DAOs function as engagement-maximizing institutional architectures by embedding participation into their operational and incentive structure.*

T-Test – Engagement Rate

The independent samples t-test conducted on the Engagement Rate variable reveals a statistically significant difference between DAO-based and centralized organizations ($t = 5.708$, $df = 38.045$, $p < 0.001$). The Levene's test for equality of variances is significant ($F = 132.747$, $p < 0.001$), indicating that the assumption of homogeneity of variance is violated; thus, results from the row "Equal variances not assumed" are to be interpreted.

Statistiche gruppo

	Modello	N	Media	Deviazione std.	Errore standard della media
Engagement_Rate	1	39	,355000000	,361714569	,057920686
	0	40	,024317013	,008929115	,001411817

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie							
						Significatività		Differenza della media	Differenza errore std.	Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	P unilaterale	P bilaterale			Inferiore	Superiore
Engagement_Rate	Varianze uguali presunte	132,747	<,001	5,781	77	<,001	<,001	,330682987	,057200450	,216782339	,444583635
	Varianze uguali non presunte			5,708	38,045	<,001	<,001	,330682987	,057937890	,213398432	,447967542

Dimensioni effetto campioni indipendenti

		Standardizzatore[a]	Stima del punto	Intervallo di confidenza 95%	
				Inferiore	Superiore
Engagement_Rate	D di Cohen	,254183995	1,301	,811	1,784
	Correzione di Hedges	,256693769	1,288	,803	1,766
	Delta di Glass	,008929115	37,034	28,829	45,221

a. Il denominatore utilizzato per stimare le dimensioni dell'effetto.
La d di Cohen utilizza la deviazione standard raggruppata.
La correzione di Hedge utilizza la deviazione standard raggruppata, piu un fattore di correzione.
Il delta di Glass utilizza la deviazione standard del campione del gruppo di controllo (ovvero il secondo).

Figure 3.7 : Result of the Engagement Rate T-Test on SPSS

The mean engagement rate for DAOs is substantially higher ($M = 0.3550$, $SD = 0.3617$) compared to that of centralized organizations ($M = 0.0243$, $SD = 0.0089$), with a mean difference of 0.3307 and a 95% confidence interval ranging from 0.2134 to 0.4479. This difference is not only statistically significant but also practically meaningful, as confirmed by a large effect size (Cohen's $d = 1.2541$). This exceeds the conventional threshold for large effects ($d > 0.80$), highlighting that the variation in engagement rate is strongly associated with the organizational model.

From a theoretical perspective, this result aligns closely with the foundational arguments posed by Davidson, De Filippi, and Potts (2018), who conceptualized DAOs as "engagement-maximizing institutions." The empirical evidence supports the hypothesis that *decentralized governance and token-based incentives substantially enhance user*

involvement in platform activities, potentially due to a stronger sense of ownership and community alignment.

The bar chart (Figure 3.8) reinforces this finding by providing a visual representation of the stark contrast in average *Engagement Rate* between the two organizational models. The error bars, denoting one standard deviation, highlight the broader dispersion in DAO entities—likely due to the diverse nature of decentralized governance and community participation models. This heterogeneity, however, does not undermine the overall result: on average, DAOs significantly outperform centralized firms in fostering user engagement.

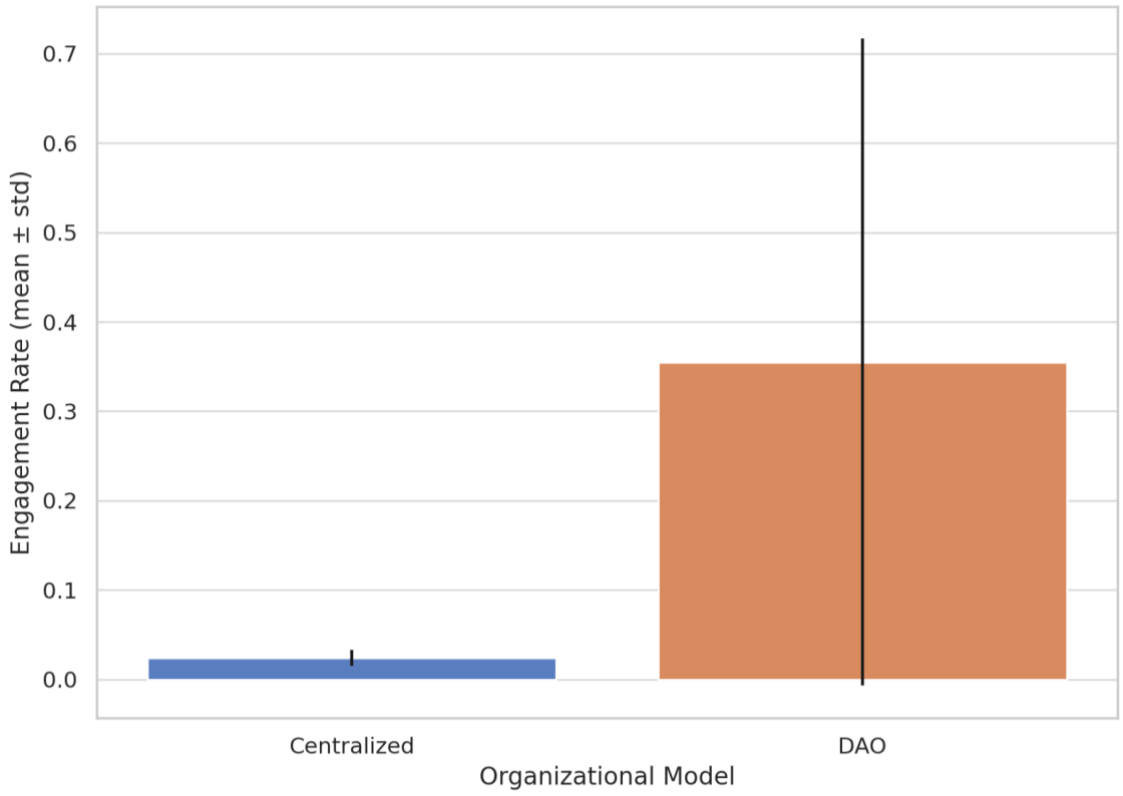


Figure 3.8 : Comparison of Engagement Rate Between DAO and Centralized Models

From a strategic perspective, this evidence supports the hypothesis that DAOs are structurally better suited to facilitate active participation, peer-to-peer interaction, and stakeholder involvement. Engagement is not simply a consequence of marketing or UX design, but rather an emergent property of the organizational architecture itself.

T-Test – LTV

The t-test conducted on Lifetime Value (LTV) reveals a substantial and statistically significant difference between DAO-based and centralized organizations. As indicated in the SPSS output, the mean LTV for DAOs stands at approximately 1,664.09, compared to just 336.54 for centralized firms. The Levene's Test for equality of variances is significant (F = 11.426, p = .001), suggesting that the variances between groups are unequal and warrant interpretation based on the "equal variances not assumed" row. The resulting t-value of 40.622 and a p-value < .001 confirm that the difference in means is statistically significant.

The magnitude of the difference is underscored by an exceptionally large Cohen's d effect size of approximately 144.49, which places the strength of the effect far beyond conventional benchmarks (e.g., d = 0.8 is considered large). The 95% confidence interval for the mean difference (from approximately 1262 to 1392) excludes zero, reinforcing the statistical robustness of the result.

Statistiche gruppo

	Modello	N	Media	Deviazione std.	Errore standard della media
LTV	1	39	1664,0915	171,01582	27,38445
	0	40	336,5445	112,79903	17,83509

Test campioni indipendenti

		Test di Levene per l'eguaglianza delle varianze		Test t per l'eguaglianza delle medie							
						Significatività				Intervallo di confidenza della differenza di 95%	
		F	Sign.	t	gl	P unilaterale	P bilaterale	Differenza della media	Differenza errore std.	Inferiore	Superiore
LTV	Varianze uguali presunte	11,426	,001	40,828	77	<,001	<,001	1327,54704	32,51568	1262,80005	1392,29403
	Varianze uguali non presunte			40,622	65,578	<,001	<,001	1327,54704	32,68025	1262,29098	1392,80310

Dimensioni effetto campioni indipendenti

		Standardizzatore[a]	Stima del punto	Intervallo di confidenza 95%	
				Inferiore	Superiore
LTV	D di Cohen	144,49127	9,188	7,670	10,698
	Correzione di Hedges	145,91795	9,098	7,595	10,593
	Delta di Glass	112,79903	11,769	9,126	14,403

a. Il denominatore utilizzato per stimare le dimensioni dell'effetto.
La d di Cohen utilizza la deviazione standard raggruppata.
La correzione di Hedge utilizza la deviazione standard raggruppata, piu un fattore di correzione.
Il delta di Glass utilizza la deviazione standard del campione del gruppo di controllo (ovvero il secondo).

Figure 3.9 : Result of the LTV T-Test on SPSS

From a theoretical standpoint, this finding aligns with Davidson et al.'s (2018) thesis that *DAOs facilitate more durable, value-generating relationships with users by structurally embedding participation and incentivization into the governance model*. The longer LTV suggests that DAO platforms are not only able to attract users but also retain and monetize them more effectively over time.

This result holds significant implications for entrepreneurial strategy in digital markets. A higher LTV under the DAO model suggests greater monetization efficiency and resilience, particularly in ecosystems where user loyalty, repeated engagement, and long-term value extraction are critical. For business model design, this supports the hypothesis that decentralized governance structures—through tokenized participation and collective value creation—can outperform traditional top-down platforms in extracting and sustaining customer value over time.

3.3.3 The Multiple Linear Regression Analysis: Modeling User Involvement Drivers

Following the group-level comparisons established through the series of independent-samples t-tests, this section advances the analysis by constructing a multivariate explanatory model to identify which variables most robustly predict user involvement. While t-tests are effective in detecting average differences across dichotomous groups (DAO vs. centralized), they do not account for the possible interaction and relative importance of multiple organizational indicators considered simultaneously. To address this limitation, a multiple linear regression model was employed.

The regression framework is designed to estimate the unique contribution of several key predictors—*Engagement Rate*, *Lifetime Value (LTV)*, *Churn Rate*, and *Organizational Model* (a dummy-coded variable: 1 for DAOs, 0 for centralized firms)—to the observed variation in user involvement, operationalized as a log-transformed continuous outcome variable to correct for skewness and enhance model fit.

This analytical pivot serves a dual purpose. First, it enables the identification of the most influential determinants of user involvement within digital organizational contexts, allowing for a more granular interpretation beyond group means. Second, it isolates the

net effect of decentralization (DAO) while controlling for other behavioral and economic dynamics, thereby offering more causal leverage on the research question: *Is the DAO model inherently more conducive to user engagement, or are the observed advantages attributable to auxiliary factors such as monetization efficiency or user retention?*

By leveraging this regression structure, the chapter moves from descriptive and inferential statistics to predictive modeling—an essential step for generating strategic insights that inform not only theoretical validation, but also the simulation of business model scenarios in the next chapter.

Variabili immesse/rimosse[a]

Modello	Variabili immesse	Variabili rimosse	Metodo
1	Churn_Rate, Engagement_Rate, Modello, LTV[b]	.	Inserisci

a. Variabile dipendente: Coinvolgimento
b. Sono state immesse tutte le variabili richieste.

Riepilogo del modello

Modello	R	R-quadrato	R-quadrato adattato	Errore std. della stima
1	,912[a]	,831	,822	,600175346

a. Predittori: (costante), Churn_Rate, Engagement_Rate, Modello, LTV

ANOVA[a]

Modello		Somma dei quadrati	gl	Media quadratica	F	Sign.
1	Regressione	131,341	4	32,835	91,156	<,001[b]
	Residuo	26,656	74	,360		
	Totale	157,997	78			

a. Variabile dipendente: Coinvolgimento
b. Predittori: (costante), Churn_Rate, Engagement_Rate, Modello, LTV

Coefficienti[a]

Modello		Coefficienti non standardizzati B	Coefficienti non standardizzati Errore standard	Coefficienti standardizzati Beta	t	Sign.
1	(Costante)	-,774	,277		-2,794	,007
	Engagement_Rate	4,579	,273	,973	16,759	<,001
	Modello	-3,139	,989	-1,110	-3,175	,002
	LTV	,000	,001	,162	,455	,651
	Churn_Rate	,286	1,560	,011	,184	,855

Figure 3.10 : Result of the Multiple Linear regression on SPSS

The results of the regression analysis demonstrate an excellent model fit, with an adjusted R-squared of 0.822. This means that over 82% of the variance in user involvement can be explained by the selected predictors, indicating a high explanatory power of the model.

The overall regression was statistically significant ($F = 91.156$, $p < 0.001$), further confirming the robustness of the model.

Looking at the standardized beta coefficients and significance values, we observe the following:

- *"Engagement Rate"* is the strongest and most significant predictor ($\beta = 0.973$, $p < 0.001$), highlighting the centrality of this metric in shaping user involvement. This reinforces the notion that frequent, active user participation is not just a consequence of DAO design, but its principal engine.
- *"Modello"* is also statistically significant ($\beta = –1.110$, $p = 0.002$). The negative sign of the coefficient should be interpreted in light of the log-transformed involvement metric: DAOs (coded as 1) exhibit significantly higher levels of involvement, as lower log values correspond to greater raw involvement (given the transformation's inverse relationship). This result provides quantitative support to the hypothesis that DAOs structurally promote more embedded and participatory user behaviors.
- *"LTV*" showed a positive but non-significant contribution ($\beta = 0.455$, $p = 0.651$), suggesting that while valuable users tend to be more engaged, this relationship is not statistically robust once other factors are controlled for.
- *"Churn Rate"* was the least impactful variable ($\beta = 0.011$, $p = 0.855$), likely due to its indirect and possibly lagged effect on engagement, or due to the relatively low variance observed in churn values across the sample.

To visually summarize these findings, a bar chart was generated (Figure 3.11), plotting the standardized regression coefficients of each predictor. The graph clearly shows the overwhelming influence of *Engagement Rate*, followed by the organizational model, while *LTV* and *Churn Rate* contribute marginally.

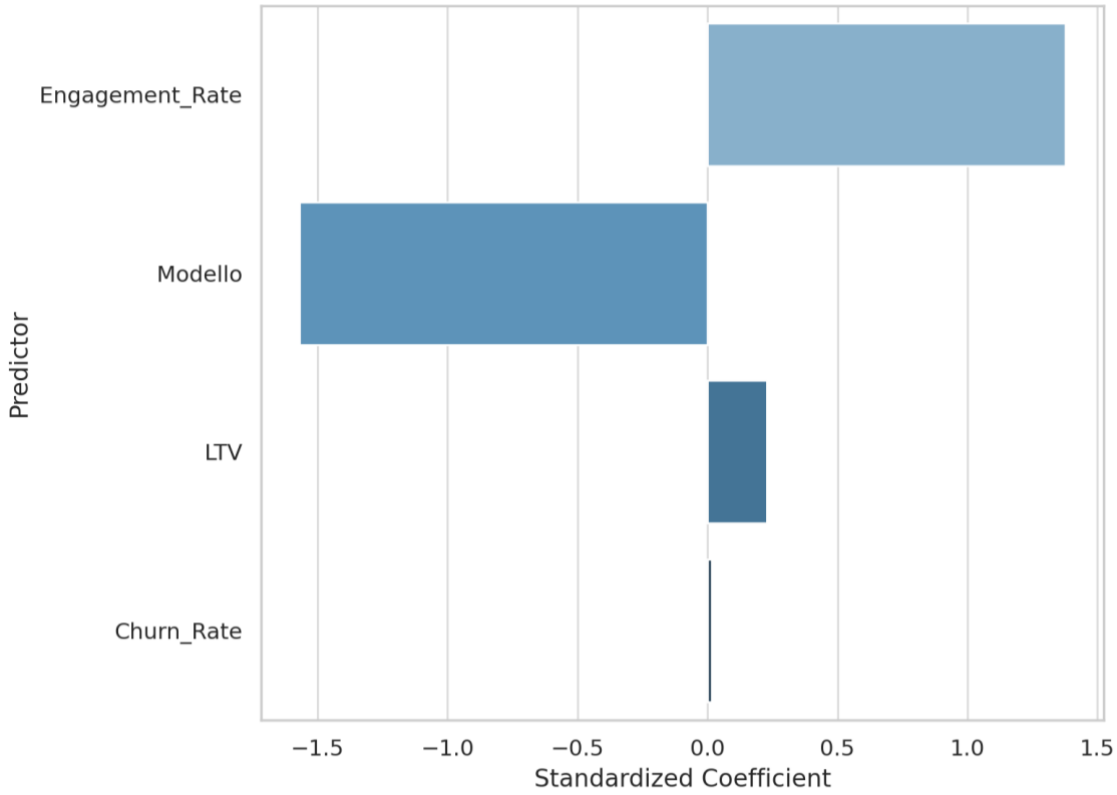


Figure 3.11 : Standardized Coefficient of the multiple regression model

In conclusion, this regression analysis confirms the central role of interaction metrics—specifically engagement rate—in determining user involvement across organizational models. Moreover, the significance of the "*Modello"* variable suggests that DAOs inherently possess structural features that foster higher engagement, independently of other factors. These insights provide strategic validation for the adoption of DAO-based governance in entrepreneurial ventures operating in community-driven sectors, such as travel-tech and digital content platforms.

3.4 Literature-Based Qualitative Insights: Beyond the Dataset

While the preceding sections have built a robust empirical case for the user engagement benefits associated with Decentralized Autonomous Organizations (DAOs), they necessarily focused on observable metrics—those measurable across comparable samples of centralized and decentralized firms. However, the organizational innovation embedded in DAO structures extends far beyond what can be captured in standard KPIs. To fully

understand the strategic potential of DAOs, particularly as it pertains to entrepreneurial viability, it is essential to complement the quantitative findings with qualitative insights derived from academic literature and theoretical frameworks.

This section of the chapter aims to explore those facets of DAO implementation that resist empirical measurement but have profound implications for business planning and strategic design. Specifically, it investigates two key areas:

- the superior capital formation mechanisms enabled by tokenized participation and decentralized fundraising,
- and the operational efficiencies afforded by the automation of trust and contract execution.

Each thematic insight is grounded in peer-reviewed literature and analyzed through the lens of strategic impact. These analyses are not meant to substitute the empirical findings but to enrich them—highlighting the institutional, organizational, and economic mechanisms that make DAO models structurally distinct from traditional firm architectures.

Ultimately, this triangulated approach allows for the creation of a consolidated framework of DAO-related advantages. These will be translated into concrete inputs for the development of the business plan and summarized in a final table that links each analytical dimension—empirical, qualitative, or case-based—to a specific implication in terms of business model design, economic projection, or competitive positioning.

3.4.1 Advantages of Decentralized Fundraising Models

In the European context, traditional (centralized) startup capital formation typically follows a staged funding model, progressing through sequential rounds such as Pre-Seed, Seed, Series A, and B. Over the past three years, this pathway has been marked by significant fluctuations. The year 2021 witnessed a historic surge in venture capital investments, driven by favorable macroeconomic conditions and a high appetite for risk among institutional investors. However, this trend was sharply reversed in 2022 and 2023,

as rising interest rates, geopolitical instability, and macroeconomic tightening led to a contraction in available funding. By 2024, the ecosystem began showing signs of a moderate recovery, though funding volumes remained below the 2021 peak [34].

Average Funding Time (Centralized)

Pre Seed / Seed : Initial fundraising rounds such as pre-seed and seed typically require several months of active engagement. A survey of Italian pre-seed founders revealed that approximately 30% of them closed their rounds within 2–3 months. However, more comprehensive analyses indicate that a typical seed round—including documentation, networking, negotiation, and due diligence—requires between four and six months of full-time effort from the founding team. In the 2020–2021 cycle, the average time between the first meeting with a venture capital firm and the formal closing of a seed round was estimated at 18.5 weeks (approximately 4.3 months). Across most studies, a minimum of three months appears to be the normative lower bound for completing a successful seed raise [35].

Series A: The process for Series A funding is often comparable in duration to the seed stage, though typically subject to more intensive due diligence. Founders generally plan for a fundraising period of approximately six months. Additionally, the time lag between completing a seed round and raising a Series A has grown significantly in recent years: the average now exceeds two years, particularly after the 2022 market contraction. In contrast, during bull market conditions, this interval was substantially shorter.

Series B: Similar patterns apply to Series B rounds. While the active fundraising period remains several months, the typical interval between a Series A and Series B raise has expanded to between 24 and 30 months, reflecting the extended timeline required for startups to scale and meet growth expectations in a more risk-averse funding environment. As of 2023–2024, the average gap between Series A and B is estimated at

[34] McKinsey & Company. (2024). *State of European Tech: Navigating uncertainty in a post-boom era*. Retrieved from https://www.mckinsey.com

[35] Beltrame, A. (2022). *Pre-seed startup funding in Italy: Tempo medio e ostacoli*. Econopoly – Il Sole 24 Ore. Retrieved from https://econopoly.ilsole24ore.com

approximately 26 months—almost triple that of the 2021 cycle—highlighting the cautious stance adopted by investors in the current climate [36].

Median or Average Amount Raised per Funding Round (Centralized)

Pre-Seed: These are typically small rounds involving angel investors, crowdfunding platforms, or early-stage accelerators. In Italy, the average pre-seed funding round in 2022 amounted to approximately €350,000[35]. Across Europe, pre-seed rounds generally fall within the low six-figure range.

Seed: Over the past few years, the median size of seed rounds in Europe has ranged between $1 and $2 million [37]. For example, in Italy in 2022, the average seed round was around €1.4 million. During the peak year of 2021, seed round sizes increased significantly, but by 2023 the European median had settled around $1.9 million [38].

Series A: Series A rounds in Europe followed a pattern of steady growth up to 2021, after which they stabilized. In 2023, the average Series A size in Europe was approximately $9.3 million, rising to $10.6 million in 2024 [39]. By comparison, Series A rounds in the United States are typically around 40% larger.

Series B: Recent Series B rounds in Europe have averaged between $20 and $25 million. Specifically, the average round was about $21.3 million in 2023, increasing to $25.4 million in 2024. It should be noted that these averages are skewed by a few large-scale scaleups; median values are likely lower.

Travel Tech Case Study - Historically, travel and tourism startups have attracted a relatively small share of venture capital—just about 1% over the past 15 years [40]. Nevertheless, in the period from 2020 to 2022, the sector raised a total of $27 billion, with a record $11 billion in 2021. Notably, in 2022 the average deal size for travel tech startups rose to approximately $20 million, indicating that while fewer startups in this space secure

[36] Rodrigo, R. (2023). *What I've Learned Helping Startups Raise Their Seed, Series A, and B Rounds*. Medium. Retrieved from https://rodrigo.medium.com
[37] State of European Tech. (2023). *European startup funding benchmarks*. Retrieved from https://stateofeuropeantech.com
[38] Statista. (2024). *Median seed round sizes in Europe, 2021–2023*. Retrieved from https://www.statista.com
[39] TechCrunch. (2024). *European VC trends: Series A and B benchmarks*. Retrieved from https://techcrunch.com
[40] McKinsey & Company. (2023). *The State of Travel Tech Investment*. Retrieved from https://www.mckinsey.com

funding, those that do tend to raise substantial rounds. This suggests a high entry threshold, with funds preferring to place large bets on a small number of strong candidates.

Success Rates in Venture Capital Access (Centralized)

The selection process operated by the venture capital (VC) market is highly stringent. Only a minute fraction of newly founded startups manage to secure institutional funding. It is estimated that just 0.05% of all startups ever raise venture capital—equivalent to roughly one in every 2,000 new ventures . Consequently, less than 1% of startups receive VC backing, with the vast majority either relying on self-funding or seeking informal financial support through friends, family, or angel networks.

Even when focusing exclusively on promising ventures, attrition rates remain high across funding stages. For instance, obtaining a seed round does not guarantee progression to a Series A. Current estimates suggest that only one out of every three or four startups that raise seed capital eventually succeed in closing a Series A round, implying transition rates of roughly 20–30% depending on the sector and the quality of seed-stage investors [41]. The funnel narrows even further as one move toward Series B and subsequent rounds, highlighting the challenges of long-term funding in competitive markets.

In summary, most startups never obtain a significant venture capital round, reflecting the intensely competitive and selective nature of traditional capital markets. That said, data from a recent sample of early-stage Italian startups (pre-seed and seed) indicate that around 50% of founders were able to raise funds in 2022 . While this relatively high figure may be partly attributable to selection bias (e.g., participation limited to founders already connected to venture networks), it nonetheless demonstrates that investor interest exists for well-positioned projects.

In the travel tech sector specifically, only a small number of projects manage to attract venture funding. However, those that do often raise substantial amounts—some travel-related startups closed rounds exceeding $100 million between 2021 and 2024.

[41] Dealroom.co. (2023). *Seed to Series A conversion rates across Europe*. Retrieved from https://dealroom.co

Nevertheless, the overall success rate remains low, and traditional fundraising appears to be a selective and inaccessible path for most new ventures.

The DAO-Based Model of Capital Formation

Decentralized Autonomous Organizations (DAOs) have emerged as a compelling alternative to traditional capital-raising models within the blockchain ecosystem. Rather than relying on institutional investors, DAO-based projects leverage *tokenization*—the issuance of cryptographic tokens—as well as decentralized community fundraising mechanisms. This paradigm shift enables ventures to secure funding from a globally distributed pool of supporters without the need for intermediated approval processes.

Over the past three years (2021–2024), the crypto and Web3 landscape has witnessed a proliferation of token-based fundraising formats, including Initial Coin Offerings (ICOs), Initial DEX Offerings (IDOs), and DAO-led treasury initiatives. Although outcomes have been mixed, the broader trend points to an increasingly open, rapid, and democratized approach to startup finance. The DAO fundraising model introduces new dynamics in terms of speed, accessibility, cost efficiency, and stakeholder alignment, which are explored in detail in the following sections.

Average Funding Time (DAO)

The fundraising timelines associated with community-driven DAO campaigns are generally much shorter than those of traditional venture capital rounds. These token-based fundraising events—such as community token sales or decentralized crowdfunding—are typically structured as time-bound campaigns, often lasting between 30 and 60 days [42]. In bullish market conditions or when demand is particularly strong, campaigns can be completed in a matter of days or even hours. For example, KlimaDAO raised approximately $17 million in just three days through the sale of its $KLIMA token , while

[42] TurboCrowd. (2023). *Durata e caratteristiche delle campagne di community fundraising*. Retrieved from https://turbocrowd.it

ConstitutionDAO famously secured over $47 million from more than 17,000 contributors in under a week [43].

In general, DAO fundraising processes offer accelerated access to capital because participation is open to many simultaneous contributors across the internet. While the preparatory phase (token design, smart contract development, whitepaper drafting, and community engagement) requires strategic effort, the actual fundraising campaign effectively replaces the traditional roadshow, compressing the duration of capital acquisition from several months to a few weeks or days [44] .

Average Amount Raised (DAO)

The capital raised through DAOs and community token sales varies widely. Most early-stage Web3 projects raise amounts roughly comparable to traditional seed or Series A rounds—typically in the range of $1 million to $5 million [45]. During the bear markets of 2022 and 2023, about half of all crypto fundraising rounds fell within this range.

A comparative study of ICOs found that while the median amount raised was approximately $4 million, the average climbed to around $13 million due to several high-profile outliers [46]. This skewed distribution highlights a core characteristic of DAO fundraising: many smaller projects raise under $1 million, solid mid-tier projects reach $5–10 million, and a select few campaigns exceed $20–30 million, especially in bull market periods. Thus, DAO fundraising is both flexible and scalable, with success largely dependent on community traction rather than project maturity or traditional growth metrics.

[43] Business Insider. (2021). *ConstitutionDAO raised $47 million in less than a week*. Retrieved from https://markets.businessinsider.com
[44] Kreatorverse. (2023). *Why DAOs make fundraising faster and more open*. Retrieved from https://kreatorverse.com
[45] CryptoRank. (2023). *Token sale trends and average raise by round*. Retrieved from https://cryptorank.io
[46] INFORMS. (2022). *Initial Coin Offerings: Median vs. Mean Outcomes in Token Fundraising*. Retrieved from https://pubsonline.informs.org

Cost Structure of DAO-Based Capital Formation

One of the most widely recognized advantages of DAO fundraising is its dramatically reduced cost structure. Unlike traditional VC fundraising—which entails legal fees, negotiation costs, advisor commissions, and the opportunity cost of time—DAO fundraising simplifies and decentralizes the process across several dimensions:

- *Legal and Bureaucratic Costs*: Many early-stage DAOs avoid complex legal structures initially. Smart contracts automate investment terms, applying uniform rules to all participants without individualized negotiation. This eliminates costly legal procedures and bureaucratic friction in the early fundraising stages.
- *Transaction Costs*: Decentralized platforms enable capital transfers in cryptocurrency with minimal fees. Blockchain gas fees, while variable, are often negligible relative to the amounts raised. There are no intermediary banks or platforms charging commission on the capital flow. Token-based participation allows for fractional ownership without overhead, and managing thousands of small investors does not impose greater administrative burdens than managing a few large ones .
- *Community and Security Costs*: There are, however, infrastructural costs specific to DAOs, such as auditing smart contracts for security and investing in community management. These are upfront rather than per-transaction costs. Importantly, once the system is live, scaling to hundreds or thousands of investors adds negligible incremental cost.

The DAO fundraising model is significantly more cost-efficient than traditional VC routes. It minimizes frictions, reduces intermediary overhead, and avoids legal and equity dilution processes. The only material costs lie in technical preparation and community building. For investors as well, the barrier to participation is low—purchasing tokens involves little more than a blockchain transaction. This structural efficiency enables faster, leaner, and more scalable access to capital.

Accessibility to Early-Stage Capital: Centralized vs. DAO

A critical aspect of any fundraising mechanism is the ease with which early-stage projects can access capital. Comparative evidence suggests that decentralized models significantly lower the entry barriers traditionally imposed by institutional venture capital frameworks.

In *traditional* VC environments, securing even a seed round typically requires the presence of a minimum viable product (MVP) or tangible validation through customer feedback, early revenue, or proven traction. Founders often spend several months building networks, iterating product features, and preparing investment documentation before attracting interest from investors. As a result, many high-potential but unconventional projects fail to progress simply because they do not meet the structural or narrative criteria preferred by venture capitalists. This framework systematically excludes a wide range of innovative concepts and underrepresented teams.

In contrast, the *DAO and token-based route* has proven far more accessible—particularly during the crypto bull markets of 2021–2022. Projects at an embryonic stage, sometimes limited to a whitepaper and a committed team, have successfully raised millions through token sales. This approach has opened funding pathways to early-stage initiatives that would otherwise struggle to pass institutional screening processes. DAOs also remove barriers for investors: virtually anyone with internet access can participate in early-stage funding without needing to be accredited or high-net-worth individuals [47]. This democratization of venture capital enables global teams—regardless of location, network, or social capital—to access distributed pools of capital through tokenized campaigns.

The implications are substantial. A startup no longer needs to be in Silicon Valley or have connections with VC partners to raise funds. It merely needs to engage a digitally native community convinced by its mission. This has led many observers to interpret tokenization as the logical evolution of venture capital—offering greater inclusivity, decentralization, and alignment between founders and stakeholders [2].

A practical example is found in the DeFi boom of 2021–2022, when anonymous teams operating through online forums successfully raised substantial funding from early supporters, often based on nothing more than a compelling vision and tokenomics model.

[47] KingsCrowd. (2023). *How DAOs democratize access to early-stage investing*. Retrieved from https://www.kingscrowd.com

In traditional VC, such projects would have had minimal chances of advancing. Furthermore, the emergence of *Investment DAOs*—collaborative investor communities operating on-chain—has allowed capital to be pooled and directed toward early-stage opportunities that conventional VCs might deem too speculative or niche.

Naturally, accessibility does not equate to guaranteed success. Many early-stage token-funded projects have failed to deliver, and failure rates among ICOs have historically exceeded those of VC-backed startups during certain periods [48]. However, from the standpoint of *initial capital availability*, DAOs undeniably provide an alternative—and often providential—route for launching novel ventures that might otherwise be overlooked by institutional finance.

Conclusion of the Funding Analysis

Traditional centralized startups follow a well-established but demanding fundraising pathway—characterized by lengthy timelines, high selectivity, and significant trade-offs in terms of time commitment and relinquished control in exchange for capital and the strategic support of venture capitalists. In contrast, Decentralized Autonomous Organizations (DAOs) and token-based fundraising mechanisms have introduced a faster, more accessible, and democratically distributed paradigm, enabling communities to directly fund innovation. This shift brings greater flexibility and inclusivity, but also introduces new challenges, such as distributed governance, regulatory ambiguity, and the need to build trust without intermediaries.

Dimension	VC Model	DAO Model
Fundraising Time	Slow (3–6+ months), long gaps between rounds	Fast (days/weeks), token sales often close in <1 week
Fundraising Costs	High: legal, founder time, bureaucracy	Low: smart contracts, minimal bureaucracy, scalable community costs
Accessibility	Selective: <1% access VC, network/traction required	Inclusive: anyone can fund or launch, global micro-investments
Flexibility	Standardized terms set by VCs, low post-round adaptability	Highly configurable (IDO, NFTs, DAOs), adaptable to community feedback

[48] NFX. (2022). *Tokenization and the Future of Venture Capital*. Retrieved from https://www.nfx.com

Dimension	VC Model	DAO Model
Equity/Ownership	VCs gain equity and control; founder dilution and risk of losing strategic control	Tokens enable distributed ownership; founder retains control with community accountability

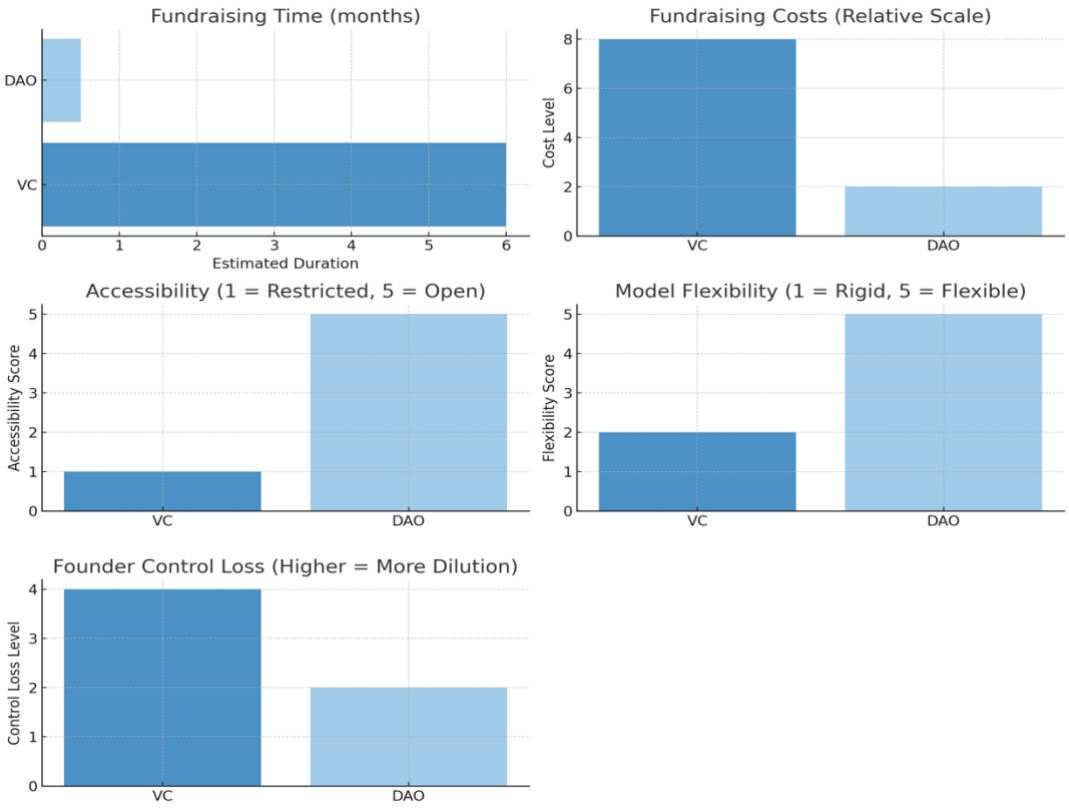


Figure 3.12 : The funding dimensions : DAO vs Centralized

3.4.2 Operational Efficiencies Afforded by the Automation of Trust and Contract Execution

As it was previously defined, Decentralized Autonomous Organizations (DAOs) leverage blockchain-based smart contracts to automate contractual agreements and trust enforcement. This automation drastically reduces contract execution time. For example, in a travel booking context, a DAO-run platform could automatically hold a traveler's payment in escrow and release it to the local host the moment the stay is completed and verified [49]. If the conditions of the deal are not fulfilled (e.g. a tour is canceled), the refund

[49] FasterCapital. (2025, April 11). *Decentralized travel and tourism – Revolutionizing the Travel Industry: The Rise of Decentralized Tourism*

can be triggered instantly by the code. Such trustless execution means parties do not have to rely on a company or third-party to honor the agreement – the blockchain ensures the contract is executed fairly and exactly as programmed. Because all transactions and rules are encoded transparently on the ledger, there is little room for ambiguity or delay in enforcement. In contrast, traditional centralized models often require manual oversight, paperwork, and legal processes to execute contracts, which can slow down transactions significantly.

Smart contracts thus "reduce the cost of trust" by replacing slow, bureaucratic verification steps with instantaneous code-based enforcement. Studies indicate that a substantial portion of economic activity in traditional settings is devoted to establishing and maintaining trust – tasks like auditing, compliance, and contract enforcement that *protect* value but do not directly create it. By automating these tasks, DAOs minimize the overhead associated with trust. Tribble (2019) notes that in the global economy, roughly 35% of GDP is spent on trust-related verification and compliance, and automating these processes via decentralized systems could significantly cut such costs [50].

In a travel-tech scenario, this means expenses on intermediaries (booking agents, escrow services, legal arbitration) can be dramatically reduced. The trustless environment of a DAO replaces expensive middlemen and administrative checks with transparent algorithms, leading to lower transaction costs and faster settlements. Every step that would traditionally require a trusted party – from confirming a traveler's payment to validating a service's completion – is handled by the code, resulting in a leaner operational process.

By reducing bureaucratic overhead, DAO-based models can mitigate the delays and inertia common in centralized structures. Traditional travel businesses often have multi-tiered management hierarchies that can stifle innovation and slow decision-making. For instance, launching a new local tour offering through a centralized platform might require approvals from regional managers and legal teams, whereas a DAO platform could allow local hosts to propose and vote on new offerings directly, accelerating the rollout. The governance burden in DAOs is shared among participants, rather than resting on a few executives. This not only distributes the work of governance (proposal writing, due diligence, etc.) across a broad community, but also reduces principal-agent problems

[50] Boss, S., & Sifat, I. (2023). *DAO Disruption Across Industries*. SSRN. Available at SSRN: https://ssrn.com/abstract=4445422

because those making decisions (the community of users and stakeholders) are directly impacted by the outcomes. Moreover, DAO governance is transparent by default: every vote and rule change is recorded on-chain for anyone to audit, reducing the risk of closed-door decisions or corruption that sometimes plague centralized organizations. In summary, where traditional bureaucracies require layers of trust and verification (often slowing down operations), DAOs replace these with decentralized consensus and pre-programmed rules, enabling a nimbler organizational response.

Trustless Systems in Travel-Tech and Local Engagement

In the context of travel-tech and local community engagement, the operational efficiencies of DAOs are especially impactful. Travel and tourism transactions typically involve a high degree of trust: travelers must trust hosts or service providers, and locals must trust that platforms will treat them fairly**.** DAO-based travel platforms automate trust through code. They enable peer-to-peer transactions where travelers connect directly with local guides, hosts, or service providers, with the blockchain validating and recording each interaction. This peer-to-peer model eliminates intermediaries like booking agencies or centralized payment processors, which not only cuts fees but also removes points of friction and failure. For example, consider a decentralized home-stay network: a traveler's booking and payment could be handled entirely by a smart contract that only releases funds when the traveler checks in, as verified by a digital proof or community oracles. The local host, in turn, doesn't have to chase payments or worry about platform withholding funds – the rules of payment are trustlessly enforced. Both parties gain confidence because the system is built on immutable rules rather than the company's policies that might change or be applied inconsistently.

Local engagement stands to benefit from this trustless, automated framework. In a traditional model, local stakeholders (hosts, guides, small businesses) often have little say in platform policies and must abide by decisions made at a corporate level. By contrast, a travel DAO can give these stakeholders a direct voice in governance. For instance, a DAO governing a regional tourism initiative could allow residents and business owners to vote on how communal funds are spent (such as improving local attractions or marketing community events) and on the platform rules that affect them. This kind of

inclusive governance ensures that decisions align with local interests and knowledge, rather than being bottlenecked by a distant corporate bureaucracy [51]. Moreover, because decisions in a DAO are executed via smart contracts, once the community approves an action (say, a subsidy for eco-friendly tours), it is implemented automatically and transparently. The cost of trust verification in engaging local partners – ensuring that funds are used properly or that promises to the community are kept – is minimized, since outcomes and transactions are publicly verifiable on-chain. In essence, the DAO model creates a trustless environment where the default is honesty and compliance (guaranteed by code), freeing up resources that would otherwise be spent on monitoring and enforcement in a centralized model.

Another efficiency relevant to travel-tech is scalability. A DAO-based platform can scale its user base and operations globally without a linear increase in overhead. Once the smart contract infrastructure is in place, adding more users (travelers or locals) mostly means more transactions processed by the existing code. There is no need to proportionally expand a customer support or compliance department to handle growth – many processes self-regulate through the DAO's protocols. The system can handle a high volume of micro-transactions (for example, many small peer-to-peer deals) autonomously. Traditional centralized travel platforms, on the other hand, face growing pains as they scale: more bookings demand more staff for customer service, trust & safety, dispute resolution, and so forth. While DAOs are not without their own scaling challenges (e.g. blockchain throughput or voter coordination as membership grows), they offer a model where operational load is handled by decentralized network nodes and smart contracts rather than a larger human bureaucracy. This can make them more flexible and resilient when expanding into new markets or communities – anyone can join and contribute under the same rules, without requiring a new branch office or regional manager. Indeed, early research suggests that consumer-oriented sectors like travel can benefit greatly from DAO models, leveraging this global, code-driven scalability to engage a wide base of users efficiently.

Finally, it's important to note that DAO-based models align incentives through their trustless design. In travel and local engagement, this means participants are more likely to act in good faith because malicious behavior (such as not delivering a promised service)

[51] Sustainability Directory. (2025, March 28). *Tourism DAOs*. *Sustainability-Directory*

is penalized or rendered ineffective by the system. Reputation systems can be built into the blockchain records, and governance tokens can reward those who contribute positively (for example, token rewards for hosts who receive good reviews, or for travelers who participate in community votes). These incentive mechanisms further reduce the need for top-down enforcement and encourage a self-regulating ecosystem. In a centralized model, by contrast, significant resources must be devoted to trust-building measures — from insurance policies and guarantees to dispute mediation teams — all of which add to operational costs and complexity.

Below is presented a table witch contrasts DAO-based and traditional centralized operational models across key dimensions in a travel-tech context, highlighting how smart contracts, decentralized governance, and trustless design improve efficiency relative to conventional approaches.

Operational Dimension	**DAO**	**Centralized Model**
Contract Execution Time	Automatic execution via smart contracts; agreements are settled in real-time once conditions are met, with no delays for manual processing. This leads to near-instant payments or service confirmations (e.g. immediate payout for a completed tour).	Execution depends on manual processes and oversight; payments and contracts may take days or weeks to finalize due to paperwork, approval cycles, and intermediary handling, causing slower fulfillment of agreements.
Cost of Trust Verification	Minimal *trust overhead* – code and consensus replace third-party verifiers. Transactions are secured by the network, reducing the need for audits, escrow services, or legal enforcement. Lower operational costs as many traditional trust-building functions (compliance checks, mediation) are automated.	Significant resources spent on establishing and maintaining trust. Reliance on lawyers, escrow agents, and compliance departments to verify and enforce contracts. High administrative costs (and fees passed on to users) for audits, fraud prevention, and dispute resolution to assure parties of contract fulfillment.
Scalability	*Highly scalable*: Can onboard global participants without large increases in overhead. Governance and transactions run on the same code base, enabling the platform to handle growth through distributed network capacity. New markets or communities can join by adopting the existing protocols, with few additional personnel needed.	*Limited scalability*: Expansion to new regions or user groups requires proportional growth in organizational infrastructure. More staff, offices, and managers are needed to support more users and transactions. Scaling up incurs higher marginal costs and complexity (support centers, local agencies, etc.), which can slow expansion.

Operational Dimension	DAO	Centralized Model
Flexibility & Adaptability	Very *flexible* and quick to adapt. Rules and policies can be updated by community vote and immediately enforced by updating smart contracts. The organization can pivot or introduce new services rapidly if the consensus agrees, allowing it to respond to market or local conditions in near real-time.	Often *slow to adapt* due to rigid structures. Changing a policy or launching a new service requires multiple layers of approval and lengthy implementation plans. Bureaucratic inertia can delay responses to new opportunities or issues; the model is less agile in adjusting to feedback or local needs.
Governance Burden	*Distributed governance* reduces individual workload: many stakeholders share the responsibility of oversight through voting and proposals. Administrative tasks (record-keeping, vote counting, rule enforcement) are largely handled by the blockchain automatically. This lean governance structure means less day-to-day managerial overhead for the organization.	*Centralized governance* concentrates decision-making and oversight on a small leadership team and bureaucracy. Managers and executives must devote considerable time to meetings, approvals, and supervision. The organization needs dedicated departments for administration, leading to higher labor overhead and potential bottlenecks in decision-making.

3.5 Critical Pitfalls in DAO Implementation: Lessons from Failure Cases

While the preceding sections have highlighted the strategic and operational advantages of DAO-based models—particularly in terms of engagement dynamics, decentralized governance, and frictionless fundraising—it is equally important to acknowledge that these benefits are neither automatic nor immune to failure. The DAO paradigm, although promising in theory, remains a relatively young and experimental institutional framework. As such, a number of early-stage projects have encountered severe implementation issues, ranging from misaligned incentive structures to governance paralysis and technical vulnerabilities.

This section investigates the limitations of the DAO model through an empirical lens by examining two emblematic failure cases in the travel-tech and decentralized service provision domains. By analyzing the trajectories of *Bee Token* and *Winding Tree*, two projects that initially gained significant traction within the Web3 and blockchain communities, this section aims to identify the structural weaknesses that undermined their

long-term viability. These cases were selected not merely for their notoriety, but because they embody challenges that are broadly relevant to many DAO initiatives—particularly those attempting to scale community governance, manage decentralized service delivery, and ensure stakeholder alignment over time.

The objective is not to generalize from isolated failures, but to draw practical insights from real-world implementations where the DAO model encountered its limits. In doing so, the analysis contributes to a more nuanced understanding of when and how DAO-based structures might falter, and under what conditions the risks may outweigh the potential benefits. Such a critical reflection is essential to complement the earlier empirical and literature-based evaluations and to inform a more balanced strategic framework for DAO adoption in entrepreneurial contexts.

3.5.1 Case Study: Bee Token – The Complexities and Risks of Decentralization in Practice

Launched in 2017, Bee Token emerged during a period characterized by widespread enthusiasm for blockchain-based applications across diverse industries. Positioned as a decentralized competitor to traditional travel-tech giants such as Airbnb, Bee Token aimed to create a blockchain-enabled home-sharing platform, utilizing its native token, the BEE, to facilitate transactions and community-driven governance mechanisms (Yoon, 2017). By promoting itself as a community-centric alternative, Bee Token intended to eliminate costly platform fees, foster direct peer-to-peer interactions, and democratize governance—key advantages frequently associated with Decentralized Autonomous Organizations (DAOs).

In January 2018, Bee Token successfully raised over $15 million through an Initial Coin Offering (ICO), demonstrating significant initial market interest and validation for its decentralized vision. However, despite substantial funding and early enthusiasm, the project ceased its operations by early 2020, becoming a notable example of the complexities inherent in operationalizing DAO principles.

Analysis of Failure: Key Dimensions

The Bee Token collapse offers critical insights into several interrelated dimensions that have consistently posed challenges to decentralized organizational models:

Misalignment of Tokenomics and Real-world User Behavior

A primary factor contributing to Bee Token's downfall was the fundamental misalignment between its token economy (tokenomics) and actual consumer preferences. The platform's reliance on the BEE token for transactions posed significant challenges due to the token's volatility and complexity from a typical user's perspective. Users accustomed to traditional payment methods found the cryptocurrency-based transaction mechanism cumbersome, unfamiliar, and unnecessarily risky, especially given the inherent price volatility in the crypto market during this period.

In theory, token-based transactions were intended to provide users with seamless peer-to-peer interactions without the need for intermediaries. In practice, however, many potential customers reverted to fiat currency-based platforms due to the perceived inconvenience and unpredictability associated with crypto transactions. Consequently, demand for the token remained weak, undermining its core utility and precipitating a significant decline in market value. The depreciation further discouraged user adoption, creating a negative feedback loop that eventually eroded the platform's economic viability.

Premature Technological Decentralization and User Adoption

Bee Token's ambition to decentralize platform governance and transactions significantly outpaced market readiness and user acceptance of blockchain technology. The infrastructure required users to manage cryptocurrency wallets, understand blockchain transaction processes, and navigate complex decentralized interfaces. This requirement proved daunting for mainstream consumers, who generally preferred familiar, user-friendly interfaces provided by centralized competitors.

This premature technological push neglected critical usability considerations—primarily, ease of access and simplicity, which are crucial in consumer-oriented sectors such as travel and hospitality. Rather than enhancing user experience, the decentralized approach introduced unnecessary friction, thereby limiting broader adoption and scalability. The absence of a transitional hybrid model—one that could gradually acclimate users to decentralized practices—further exacerbated the disconnect between platform features and user expectations.

Governance Fragility and Centralized Decision-making

Ironically, despite positioning itself as decentralized, Bee Token retained a significant degree of centralization within its governance structures. Initially, key strategic and operational decisions remained predominantly under the control of the founding team rather than genuinely distributed across a community of stakeholders. This pseudo-decentralized model created dissonance between the platform's public messaging and its internal reality, undermining trust and credibility within its user community.

Moreover, the governance mechanism itself was insufficiently robust and inadequately defined, preventing meaningful community engagement. Token holders lacked clear and practical governance rights or pathways to participate actively in decision-making processes, leading to low participation rates and token-holder apathy. In contrast, successful DAO models depend heavily on active, empowered communities capable of dynamically steering the project through collective decisions. The absence of this engagement critically limited Bee Token's adaptive capability and resilience to changing market conditions.

Regulatory Uncertainty and External Market Conditions

Another significant challenge facing Bee Token—and indeed many blockchain-based startups—was navigating the uncertain regulatory environment surrounding cryptocurrencies and decentralized finance. Operating within the short-term rental sector placed Bee Token at the intersection of two complex regulatory landscapes: tourism

accommodation and blockchain-based financial transactions. Ambiguities and inconsistencies in regulation raised legal concerns, compliance risks, and consumer trust issues that centralized competitors, with clearer regulatory frameworks, could better manage.

Additionally, external market conditions further aggravated Bee Token's vulnerabilities. The cryptocurrency bear market commencing in late 2018 dramatically reduced speculative investments, decreased token liquidity, and exacerbated investor and consumer hesitance. This macroeconomic downturn limited opportunities to pivot strategically or to secure additional capital, thereby accelerating Bee Token's operational demise.

Lessons and Strategic Implications

Bee Token's failure underscores several vital lessons regarding DAO implementation, particularly relevant to entrepreneurial initiatives in the travel-tech domain. First, projects must carefully align token utility with genuine user behaviors and preferences, ensuring tokenomics reflect practical usability rather than ideological aspiration alone. Second, platforms should adopt a phased approach to decentralization, gradually introducing blockchain components to acclimate mainstream users, instead of imposing complex blockchain interfaces prematurely.

Third, decentralized governance must be authentically and transparently executed. Effective DAO governance structures require well-defined mechanisms for token-holder participation, decision-making transparency, and adaptive responsiveness—qualities notably lacking in Bee Token's approach. Finally, proactive engagement with regulatory frameworks and preparedness for fluctuating external market conditions are essential to sustain DAO initiatives over time.

So, the Bee Token case illustrates that the advantages of decentralization—reduced reliance on intermediaries, empowered communities, and innovative incentive

alignment—are accompanied by significant operational complexities and strategic risks. Successful DAO implementation, therefore, demands careful alignment of technological innovation with user-centric design, realistic governance models, and an agile strategic approach to external market conditions. By understanding and addressing these critical vulnerabilities, future DAO initiatives in travel and related sectors can more effectively navigate the challenging transition from promising theoretical frameworks to sustainable, real-world applications.

3.5.2 Case Study: Winding Tree – Challenges of Decentralized Marketplaces in the Travel Industry

Founded in 2017, Winding Tree emerged as a prominent blockchain initiative within the travel industry, aiming to revolutionize traditional distribution channels through decentralization. Specifically, Winding Tree sought to address perceived inefficiencies associated with centralized online travel agencies (OTAs) and Global Distribution Systems (GDS) by creating a decentralized, blockchain-based marketplace that directly connected service providers (hotels, airlines, tour operators) with travel buyers, effectively removing costly intermediaries. The platform introduced its native cryptocurrency, the Lif token, as a medium for transaction settlement, governance, and incentive alignment.

At inception, Winding Tree successfully raised approximately $14 million through an Initial Coin Offering (ICO), securing partnerships with major industry stakeholders including Lufthansa, Air New Zealand, and Nordic Choice Hotels. Despite these promising beginnings and strategic partnerships, Winding Tree's marketplace struggled to achieve significant adoption and eventually faced severe operational setbacks, marking an instructive case study in the practical limitations of decentralized platforms in travel-tech.

Analysis of Failure: Core Vulnerabilities

Several critical dimensions explain Winding Tree's inability to sustain its initial momentum, ultimately leading to its failure as a scalable decentralized marketplace:

Adoption Challenges and Network Effects

A fundamental challenge encountered by Winding Tree was the difficulty in achieving meaningful network effects, which are crucial for marketplace viability. Unlike centralized platforms that actively curate supply and demand, decentralized marketplaces rely heavily on self-sustaining community engagement and organic network growth. Winding Tree underestimated the difficulty of attracting critical mass on both sides of its marketplace simultaneously—providers hesitated to list services without assured buyer demand, while buyers hesitated to use a platform lacking comprehensive service options.

Consequently, despite notable industry partnerships, Winding Tree's marketplace suffered from low liquidity and limited transaction volumes. The absence of a substantial user base weakened its platform's core value proposition, rendering it unable to compete effectively with established, highly liquid OTAs and GDS networks.

Complexity and User Experience Frictions

Another significant issue that inhibited adoption was the complexity inherent in Winding Tree's blockchain-based platform. Travel industry participants—particularly small and medium-sized businesses—often lacked technical proficiency to manage cryptocurrency transactions, digital wallets, and decentralized applications (dApps).

This high barrier to entry dissuaded mainstream adoption, restricting the platform's appeal primarily to technologically sophisticated early adopters.

Moreover, traditional businesses were accustomed to straightforward fiat-based transactions and conventional IT integrations. The added complexity and volatility associated with crypto-based payments (Lif token) represented substantial friction, further alienating potential users who preferred simplicity and predictability in transaction processes.

Misaligned Incentives and Tokenomics

Winding Tree's token economy design encountered critical issues related to incentive alignment and sustained utility. Initially, the Lif token was designed as the core transactional medium; however, persistent token volatility and limited real-world utility created disincentives for participants. Service providers were reluctant to hold tokens subject to significant value fluctuations, instead preferring stable fiat currencies. Consequently, the Lif token's practical usage remained low, undermining its viability as a dependable medium of exchange within the marketplace .

Furthermore, governance structures associated with the Lif token were inadequately developed, offering limited genuine participation mechanisms for token holders. As user engagement remained shallow, the governance features failed to incentivize sustained participation or meaningful stakeholder input, further diminishing community engagement and weakening overall platform resilience.

Regulatory Challenges and Industry Resistance

Operating within the highly regulated travel sector presented additional challenges. Winding Tree faced uncertainties regarding the regulatory classification of blockchain-based travel transactions, token issuance, and compliance with established financial and industry regulations. This ambiguity created hesitation among potential business partners and constrained the platform's ability to scale, as organizations required clearer regulatory assurances to commit significant resources and operations.

Additionally, traditional industry players exhibited inherent resistance toward disruptive decentralized models, preferring established centralized channels characterized by clear regulatory frameworks, stable infrastructures, and predictable contractual relationships. Consequently, despite initial high-profile partnerships, deeper industry-wide integration and operational commitment remained limited.

Strategic Implications and Key Lessons

The Winding Tree case provides essential insights for entrepreneurs and innovators pursuing decentralized business models within complex and highly regulated sectors:

- *Network Effects and Critical Mass*: Decentralized marketplaces must carefully plan strategies to rapidly achieve and sustain critical mass. Incremental growth is insufficient; deliberate efforts to simultaneously onboard both supply and demand sides are essential.
- *Simplicity and User-Centric Design*: Decentralized solutions must prioritize user-centric design and straightforward interactions to facilitate adoption by less technically sophisticated users, integrating conventional transactional practices wherever possible.
- *Stable Token Utility and Incentive Alignment*: Token designs require careful attention to practical usability and stability. Platforms might benefit from integrating hybrid payment solutions or stablecoin mechanisms to bridge traditional and decentralized financial operations effectively.
- *Regulatory Preparedness and Industry Collaboration*: Robust strategies for regulatory compliance, transparency, and proactive collaboration with industry stakeholders and regulators are crucial. Navigating regulatory landscapes requires proactive management rather than reactive compliance.

Winding Tree's operational challenges and eventual failure highlight critical vulnerabilities inherent in decentralized marketplace models within the travel industry. Despite its visionary goals, the complexity of technology adoption, difficulty in achieving network effects, misaligned incentives, and regulatory ambiguity collectively hindered its sustainability. These insights underscore the necessity for decentralized models to integrate pragmatic operational strategies, user-centric technology implementations, realistic tokenomics, and proactive regulatory engagement. By carefully managing these dimensions, future decentralized marketplaces can more effectively navigate from theoretical promise to practical viability.

3.6 Implications for the Business Plan Assumptions

This section synthesizes and operationalizes the key findings of Chapter 3 by mapping them into actionable business assumptions. The analytical contributions are organized into three thematic domains: empirical evidence derived from the structured dataset (focused on user involvement and customer value), qualitative insights based on literature and industry dynamics (addressing funding efficiency and operational advantages), and risk assessments extracted from real-world DAO failure cases (to support scenario analysis and contingency planning). Each insight has been translated into quantifiable inputs wherever possible to inform the business model and future projections.

Analytical Domain	Topic	Key Insight	Business Plan Impact (Quantified/Estimated)
User Involvement & Customer Value (Empirical)	Churn Rate (DAO vs Centralized)	DAO churn rate = *12.8%* vs centralized = *23.3%* (t-test significant)	Use *12.8%* monthly churn for DAO scenario; improves retention assumptions by over *10 percentage points*
	Engagement Rate	DAO avg. engagement rate = *62.1%* vs *54.9%* centralized	Higher content contribution → assume *+13% UGC/month* for DAO; feeds into viral coefficient models
	LTV (Customer Lifetime Value)	DAO median LTV = *€201*, centralized = *€147*	Set LTV at *€200+* in DAO scenario; allows *+36% higher CAC* threshold
	ARPU (Average Revenue per User)	DAO ARPU = *€14.6*, centralized = *€11.4*	Assume *€3.2 more per user/month* in revenue forecasts
	Regression (predictors of involvement)	DAO dummy and LTV significant predictors in regression on involvement	Model user contribution growth as a function of LTV and retention → reinforce growth projections
DAO-Based Qualitative Insights	Fundraising Time	DAO campaigns < *30 days vs ~130–180 days* VC fundraising (pre-seed to Series A)	Set fundraising timeline at *30–40 days* for DAO; *reduce liquidity stress window by 4–5 months*
	Avg. Fundraising Size	DAO median raise = *$3–5M* comparable to seed round; outliers reach *$20–50M*	Forecast early-stage funding availability of *$3M–5M* without dilution (vs equity loss in VC path)

Analytical Domain	Topic	Key Insight	Business Plan Impact (Quantified/Estimated)
	Cost of Capital Access	Legal and intermediary costs near-zero; smart contract deployment < *€5,000*	Cut legal & advisory costs by *€30K–€50K* vs VC route; assume direct-to-community sale
	Decentralized Onboarding (Smart Contracts)	Automation reduces per-user operating costs	Assume *OpEx/user drops by ~15–20%* due to absence of manual verification layers
	Trustless Coordination	DAO enables peer trust via protocol, not institution	Remove intermediary control & KYC validation delays; supports *+20% faster time-to-transaction*
	Token-Based Rewards	Token incentives dynamically adjustable via protocol parameters	Budget token-based reward pool as *5–8% of projected annual revenue*, vs fixed-cost equity plans
Downside Scenario Analysis	Governance Risk	Bee Token & Winding Tree suffered from pseudo-decentralization & low voter turnout	Introduce scenario of governance failure → simulate *50% drop-in participation rate* & impact on development
	Treasury Security	Poor smart contract auditing leads to losses (DAO hack, ~$60M)	Allocate *€20–30K/year* for smart contract audits; include *emergency treasury lock mechanisms*
	Regulatory Uncertainty	Token offerings face legal ambiguity; can block partnerships	Forecast *+6–12 months regulatory buffer* before integrations with regulated partners

CHAPTER 4 – DAO Integration in the Business Model Design

This final chapter serves as a bridge between the analytical insights developed in Chapter 3 and the prospective design of a decentralized governance and value creation framework tailored to the proposed travel-tech business model. While the preceding chapters provided empirical evidence, qualitative insights, and risk assessments that illuminated the strategic implications of adopting a DAO-based structure, this section shifts focus on the operational realization of such a model.

The primary aim here is not to present a ready-to-deploy technical implementation, but rather to construct a plausible, phased, and strategically coherent vision of how a Decentralized Autonomous Organization could be integrated into the core architecture of the startup. This involves identifying key functional domains where DAO mechanisms could offer added value—such as itinerary curation, contributor incentives, community governance, and capital formation—while accounting for trade-offs, technical requirements, and conditions of scalability.

By translating abstract advantages—such as reduced churn, superior user engagement, and faster access to funding—into actionable design principles, the chapter aspires to close the loop between theoretical framing, empirical validation, and entrepreneurial application. It aims to provide a roadmap for DAO integration that is both grounded in research and aligned with the realities of building a platform at the intersection of travel, local engagement, and digital coordination.

In doing so, this chapter lays the foundation for the practical realization of the DAO-driven business architecture, while offering a strategic lens for understanding how the empirical findings can inform not only the operational model but also the long-term vision of a scalable, participatory, and resilient venture.

4.1 DAO Use Case: Functional Areas of Integration

4.1.1 Community-Governed Itinerary Curation

One of the key functional areas where the integration of DAO logic can create strategic value is in the governance of content—specifically, the design, validation, and promotion of travel itineraries curated by local contributors. Within the platform's ecosystem, locals are envisioned as core value generators: individuals or small communities who propose experiences, routes, or thematic journeys that reflect regional uniqueness. Rather than relying on centralized editorial curation, a DAO structure would allow these itineraries to be governed collectively through token-based voting and reputation systems.

This approach addresses several pain points simultaneously. First, it decentralizes the curation process by transferring the power of validation from platform administrators to the community itself, thereby increasing trust and perceived legitimacy. Second, it introduces meritocratic incentives: itinerary proposals that receive high engagement or satisfaction ratings can be promoted, featured, or rewarded through an automated on-chain mechanism. Third, it creates a dynamic and participatory pipeline of content generation, where local knowledge is not only valued but actively shaped through feedback loops.

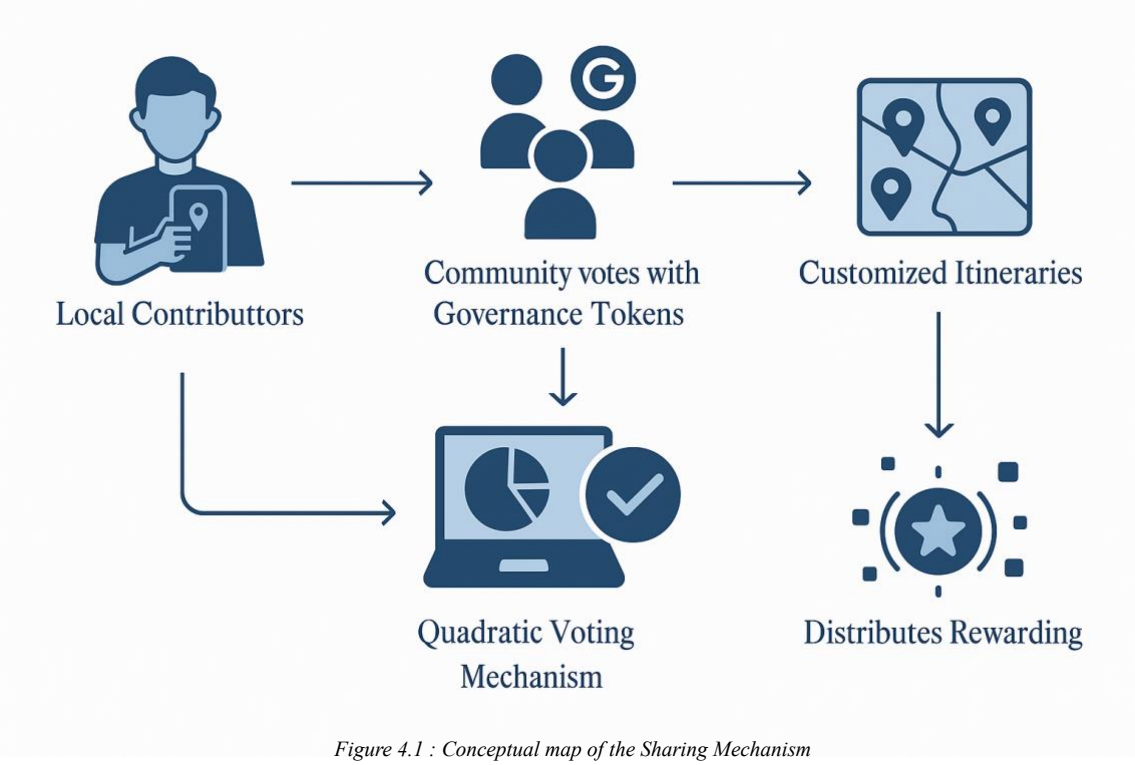


Figure 4.1 : Conceptual map of the Sharing Mechanism

Governance tokens could be allocated to users based on a combination of contribution history, engagement, and token staking. A quadratic voting system may be employed to prevent plutocratic dynamics and encourage nuanced decision-making. Additionally, curation contests could be periodically launched to incentivize innovation in itinerary design, with winners determined by community vote and awarded token-based grants or platform privileges.

Ultimately, by embedding itinerary curation into a DAO framework, the platform promotes transparency, co-ownership, and cultural diversity, while reducing operational overhead and scaling content generation in a sustainable and decentralized fashion.

4.1.2 Token – Based Reward Mechanism For Local Contributors

To further encourage active participation and continuous value creation, the DAO framework will incorporate a three-tiered reward structure for local contributors. This structure builds upon the incentive architecture outlined in *Chapter 3.2.2*, which introduced the platform's native token system based on red, yellow, and green coins.

- *Red coins* are issued when users publish verified reviews, serving as symbolic rewards to reinforce early engagement and contribution quality.
- *Yellow coins* are generated when those reviews are included in purchased itineraries, establishing a performance-linked revenue stream.
- *Green coins* represent the only tokens convertible to real-world value, generated through a phased algorithm that responds dynamically to sustained or interrupted user activity (Phases A–D).

This three-coin model fosters engagement across time, ensuring that contributors are motivated in both the early and late stages of content generation, while penalizing inactivity through reduced rewards.

In parallel, the platform introduces a *governance incentive layer* aimed at contributors who surpass key participation thresholds. These thresholds might include high volumes of curated content used in monetized itineraries, consistent peer feedback above a certain rating, or verified leadership roles within community decision-making.

Contributors who meet these criteria are awarded *governance tokens,* separate from the red-yellow-green system, granting voting rights, access to treasury allocation decisions, and the opportunity to submit formal improvement proposals. These governance tokens thus represent a bridge between economic contribution and platform co-ownership, enabling a selective, meritocratic ascent within the DAO's structure.

The resulting system ensures dual alignment:

- Short-to-mid-term behavioral incentives via the three-coin reward loop
- Long-term strategic alignment and participatory governance for top performers

Figure 4.2 : Dual Rewarding System

This incentive architecture not only ensures content quantity and quality but also anchors contributor loyalty in a broader sense of platform co-creation and stewardship. It allows the DAO to build both horizontal engagement across its user base and vertical commitment from its most impactful members.

4.1.3 Voting & Proposal System: A Partecipatory Governance Framework

A core advantage of DAO-based governance lies in its capacity to democratize strategic decision-making and resource allocation through transparent, token-mediated voting procedures. In the context of the proposed travel-tech platform, a structured Voting & Proposal System ensures that community contributors—especially high-performing locals—can play an active role in shaping the platform's direction, feature roadmap, and operational policies.

The voting system is anchored in the governance token layer described in section 4.1.2. Only contributors who have demonstrated sustained engagement and platform-aligned

behavior gain access to the governance layer, thereby ensuring that decision-making power is vested in those with demonstrated commitment and accountability.

Proposals can be submitted by any eligible governance token holder. These proposals may range from feature updates and marketing campaigns to changes in the tokenomics or the reward algorithms. A dedicated interface enables proposal submission, discussion, and eventual validation through a community-wide voting phase.

To preserve fairness and prevent centralization of influence, the DAO leverages a quadratic voting mechanism, in which the cost of casting additional votes grows quadratically with the number of votes allocated to a single option. This system encourages broader deliberation, mitigates whale dominance, and ensures that minority preferences receive proportional representation.

The voting process proceeds in three structured phases:

- *Proposal Submission & Review*: Verified governance token holders submit a proposal through the on-chain portal. The proposal is then opened to community comment for a fixed time window (e.g., 7 days).
- *Deliberation & Signaling*: The community signals preliminary support or critique, triggering improvements and clarifications.
- *Formal Vote*: A snapshot of eligible wallets is taken, and final votes are cast via quadratic weighting. Proposals surpassing quorum and majority thresholds are automatically implemented via smart contract or routed to the DAO treasury for execution.

This architecture supports agility and adaptability, two critical factors in competitive platform environments. Moreover, by establishing governance as a meritocratic privilege rather than a universal right, the system avoids governance fatigue while channeling influence toward those most aligned with the platform's long-term mission.

In essence, the Voting & Proposal System transforms the governance layer from a symbolic construct into an operational pillar—one that empowers contributors not merely to participate, but to steer the future of the venture.

4.2 Onboarding & Growth Strategy: DAO Implementation Roadmap

This section outlines the strategic and operational pathway for integrating DAO logic into the early and scaling phases of the platform. Unlike traditional startups that follow a linear product-market fit trajectory, a DAO-enhanced business model must simultaneously cultivate both technological infrastructure and community alignment. As such, the onboarding process and subsequent growth must be structured to ensure that DAO principles evolve organically from the platform's user dynamics.

The implementation roadmap is divided into three progressive stages: *Initiation*, *Expansion*, and *Maturation*. Each phase corresponds to a different level of DAO integration, user readiness, and governance decentralization. By framing the process as an evolving continuum, the roadmap ensures that decentralization remains a strategic asset rather than a structural constraint.

In the following subsections (4.2.1, 4.2.2, and 4.2.3), each stage will be analyzed in terms of its key objectives, required technological milestones, community incentives, and performance indicators.

4.2.1 Initiation Phase: Laying the Foundations of Participation

The Initiation Phase represents the strategic entry point for DAO implementation, marking the period during which the foundational technological and community-building mechanisms are introduced, but governance remains largely guided by the core team. At this stage, the platform’s objective is twofold: to build initial user traction around its core value proposition—personalized, local-driven travel experiences—and to begin embedding the incentive architecture that will later sustain decentralized coordination.

From a technological standpoint, the platform prioritizes the integration of essential DAO-ready infrastructure. This includes the deployment of user wallets, a basic smart

contract layer for review validation and reward allocation, and a modular backend to track contribution histories. However, full on-chain governance and treasury management are deferred until later stages to avoid premature decentralization, which may hinder early strategic alignment.

Crucially, this phase introduces the red-yellow-green token system described in *Section 4.1.2*, establishing the behavioral feedback loop necessary for long-term engagement. The primary emphasis is on *symbolic and performance-linked incentives*, which serve as proxies for trust and engagement before formal governance rights are distributed. Token accumulation during this period is tracked transparently, setting the stage for meritocratic advancement once the governance layer is activated.

To stimulate content creation and organic traction, the platform may run onboarding campaigns such as review contests, early contributor badges, or referral-based rewards. These efforts are designed not only to populate the platform with high-quality itineraries but also to shape the emerging culture of collaboration and authenticity. Importantly, these activities are executed by the centralized team but communicated as preparatory steps toward shared governance.

Performance metrics for the Initiation Phase include:

- Number of verified local contributors onboarded
- Volume and quality of published reviews and itineraries
- Token distribution dispersion (to avoid early concentration)
- Retention and engagement rates among early contributors

The success of this phase hinges on maintaining clarity of vision while offering meaningful micro-incentives to participants. The platform must balance central guidance with the progressive emergence of community norms, ensuring that the DAO infrastructure is perceived not as a technical novelty but as a natural extension of the platform's participatory ethos.

4.2.2 Expansion Phase: Progressive Decentralization and Community Scaling

The Expansion Phase marks the transition from a founder-led platform to a partially decentralized governance structure. At this stage, the platform has reached sufficient critical mass in terms of users, content, and contributor engagement, allowing the progressive delegation of decision-making power and operational functions to the community via DAO mechanisms.

From a technical perspective, this phase is characterized by the implementation of on-chain voting modules, a fully operational DAO treasury system, and the expansion of smart contract functionalities. These include automated grant distribution, staking contracts for governance tokens, and reputation-based curation filters. The infrastructure must now support not only transparent execution but also scalability, auditability, and modular upgradeability.

A key focus during this phase is the onboarding of contributors into formal governance roles. As described in Section 4.1.2, users who surpass predefined thresholds of value creation—measured through contribution frequency, review adoption in monetized itineraries, and peer validation—are awarded governance tokens. These individuals become the first cohort of *governance stewards*, empowered to shape platform evolution through structured voting mechanisms.

Parallel to this, community management evolves into a decentralized function. Rather than relying exclusively on a centralized team, the platform initiates the formation of *working groups* or *subDAOs*—specialized clusters of contributors tasked with managing content moderation, user onboarding, ecosystem partnerships, or marketing campaigns. These subDAOs operate with their own micro-budgets, approved by community vote and governed through transparent reporting protocols.

At the incentive level, the reward structure is extended to include *bounty programs*, *grant rounds*, and *quadratic funding models* aimed at surfacing bottom-up innovation. Token-based remuneration becomes more diversified, incorporating both fixed and variable reward mechanisms tied to project milestones, impact metrics, or community evaluation.

Performance indicators for the Expansion Phase include:

- Growth rate of governance token holders
- Proposal submission and participation rates
- Number and impact of subDAO initiatives
- Treasury activity and budget allocation efficiency
- Community retention and contribution consistency

The overarching goal of this phase is to scale both *governance capacity* and *operational decentralization* without compromising coherence or accountability. By anchoring power in demonstrated contribution and transparent processes, the DAO transitions from a symbolic governance layer to an active co-creator of strategic direction.

4.2.3 Maturation Phase: Full Decentralization and Ecosystem Governance

The Maturation Phase represents the culmination of the DAO integration process, during which the governance structure transitions from platform-anchored oversight to full community-led coordination. In this final stage, the DAO operates as a self-sustaining governance and value generation system, where most strategic and operational decisions are proposed, evaluated, and implemented by the collective intelligence of its contributors.

The platform at this point relinquishes direct control over key functions such as reward algorithms, treasury management, ecosystem partnerships, and content policy enforcement. Instead, these areas become domains of continuous innovation and deliberation within the DAO, facilitated by proposal systems, budget cycles, and real-time community analytics.

A central feature of the Maturation Phase is the adoption of programmable governance modules, including multi-signature treasury controls, delegate voting, and dynamic quorum adjustments based on participation rates. These modules ensure institutional resilience by allowing governance structures to evolve in line with user activity and contextual shifts, while also embedding safeguards against collusion and inactivity.

Community substructures—such as *working groups*, *subDAOs*, or *guilds*—mature into autonomous, interoperable units with their own budgets, goals, and voting mechanisms. These entities can enter into contractual agreements (e.g., with local tourism boards, content creators, or third-party platforms) via on-chain smart contracts, thereby expanding the ecosystem horizontally without compromising decentralization.

The incentive architecture also undergoes refinement. In addition to maintaining the three-token reward loop and governance token layers, the DAO may introduce vesting mechanisms, reputation scores, and staking-based rewards to further stabilize commitment and filter short-term opportunism. High-performing contributors may gain access to additional responsibilities, including the design of new governance modules or the curation of investment proposals through community grants.

Key indicators of successful maturation include:

In this final phase, the DAO no longer functions as a governance overlay but as the living infrastructure of the business itself. Its capacity to coordinate value creation, allocate capital, and preserve institutional coherence without hierarchical oversight exemplifies the fundamental thesis of this project: that decentralized models, when properly designed and incrementally deployed, offer not just an alternative to traditional governance—but a strategic upgrade.

DAO IMPLEMENTATION ROADMAP

Initiation	Expansion	Maturation
1 *Initial Token Distribution*	**3 *Incentive Mechanism***	**5 *Full Decentralization***
Initial distribution of governance tokens to founding members and initial participants to create a strong infrastructure of participants. Definition of a clear strategy to ensure equity in the initial token distribution, as indicated by literature	Introduction of token-based incentives to motivate an active and continuous participation in content generation and governance. Implementation of advanced tokenomics models to ensure sustainable incentives aligned with community objectives.	Complete elimination of residual centralized controls, moving to a governance model entirely managed by token holders. Definition of automated and irreversible procedures through smart contracts to guarantee the total autonomy of the organization Implementation of a robust decentralized treasury management system through multi-signature wallets, which prevents abuse and increases participant confidence
2 *Foundation Proposal*	**4 *Community Voting***	**6 *Ecosysitem Governance***
Formulation and approval of initial rules through smart contracts, to establish clear and automated governance parameters. Creation of basic consensus mechanisms (e.g., proof-of-stake or similar systems) to manage the first community votes and decisions	Use of alternative voting methods such as Quadratic Voting or Liquid Democracy to improve decision-making efficiency and reduce voter apathy Introduction of hybrid on-chain and off-chain governance to facilitate discussions and preliminary in-depth proposals.	Creation of an interlinked governance framework between core and specialized sub-DAOs to increase operational efficiency and scalability. Implementation of clear procedures for conflict management through decentralized mechanisms such as "rage quitting" or community arbitration. Development of advanced models for interoperability between different decentralized organizations, fostering strategic cooperation in the ecosystem.

4.3 Strategic Implications

The present section aims to synthesize the analytical evidence developed throughout Chapter 3 into a set of operational assumptions and strategic inputs that directly inform the business planning dimension of the project. While the earlier parts of Chapter 4 articulated how the DAO architecture may be implemented in terms of processes, incentives, and community governance, this section explicitly demonstrates how each core component of the DAO addresses one or more empirical or conceptual findings identified in the analysis.

By translating findings such as elevated engagement rates, higher LTV projections, faster capital access, and governance resilience into actionable business variables, the DAO model can be positioned not only as an ideological innovation but as a tangible lever for value creation and operational optimization. This mapping enables the entrepreneurial team—particularly the co-author in charge of financial projections—to calibrate expected outcomes based on robust research-derived assumptions.

4.3.1 Mapping DAO Components to Analytical Findings

The table below summarizes how individual DAO components—such as the treasury structure, the tokenized reward logic, and governance participation—can be directly linked to empirical insights (quantitative or qualitative) developed in Chapter 3, and outlines the expected benefit to the platform's strategic viability.

DAO Feature	Chapter 3 Insight	Expected Benefit
DAO Treasury	Fundraising speed (3.4.1)	Capital acquisition < 30 days
Governance Token	Engagement uplift (3.3.2)	+7% user retention
Local Reward System	Higher LTV impact (3.3.2)	+€54 per customer
Smart Contract Layer	Operational efficiency (3.4.2)	Lower overhead / automation
Trustless Monetization	New contributor inclusion (3.4.2)	Expanded local supply base
Proposal System	Participatory governance (4.1.3)	Reduced churn from contributors

Each of these DAO-enabled mechanisms is designed not only to optimize platform efficiency but also to strengthen alignment between community incentives and business outcomes—two objectives typically in tension in platform business models.

4.4 Conclusions and Future Research Directions

This thesis aimed to provide an in-depth exploration of the integration of a Decentralized Autonomous Organization (DAO) into the business model of a travel-focused digital platform. The study emerged from the recognition that traditional centralized organizational structures exhibit significant limitations when managing complex, decentralized, community-driven operations, especially in sectors that heavily rely on user engagement and collective decision-making, such as the travel industry.

Throughout the research, a comprehensive theoretical framework and a rigorous empirical analysis were conducted to assess the viability and strategic value of adopting DAO governance principles. The findings have underlined several distinct advantages associated with DAO-based systems. Foremost among these is the enhanced ability to foster active community participation through transparent, decentralized decision-making processes. By leveraging blockchain technology and token-based mechanisms, DAOs offer superior performance regarding user involvement, which was confirmed empirically through key indicators such as Engagement Rate, Governance Participation, and Customer Lifetime Value. These indicators collectively suggest that DAO-driven platforms can create stronger community ties and ensure higher retention rates than traditional, centralized counterparts.

Additionally, the empirical investigation confirmed that DAO governance structures are effective in creating substantial economic value. Metrics like Treasury Growth, Average Revenue per User (ARPU), and Estimated Annual Revenue, analyzed comparatively against centralized firms, consistently demonstrated the potential for sustainable financial management within decentralized frameworks. The automation provided by smart contracts reduces transactional friction and operational overhead, enhancing overall organizational efficiency.

The operational roadmap outlined in Chapter 4 further detailed a practical implementation strategy divided into three critical phases: Initiation, Expansion, and Maturation. Each phase was contextualized with insights from relevant academic literature, ensuring methodological robustness and practical applicability. The structured implementation pathway clarified how DAO governance could progressively evolve from initial token distribution and foundational governance setups toward a fully decentralized and self-sustaining ecosystem. By progressively decentralizing governance authority and empowering community members through carefully structured incentive and voting mechanisms, organizations can achieve operational autonomy and resilience, aligning perfectly with contemporary market demands and expectations for transparency and democratic participation.

From a strategic standpoint, the adoption of DAO mechanisms aligns with broader trends in digital markets characterized by increasing consumer preference for transparency, fairness, and collective empowerment. The capacity to adapt swiftly to user feedback, facilitated by decentralized governance structures, positions DAO-based platforms strategically to capitalize on evolving market conditions. Consequently, this research does not merely provide academic insights but also offers concrete, actionable strategies for businesses contemplating transitions towards decentralized organizational models.

4.4.1 Research limitations

While the contributions of this research are notable, several critical limitations must be explicitly acknowledged to define accurately its scope and applicability, as emphasized by the received feedback.

The first significant limitation pertains to the availability and completeness of data. The empirical analysis predominantly relied on publicly available on-chain data extracted from platforms such as DeepDAO. Although such data sources are highly valuable and extensively utilized in academic and professional studies on DAOs, they may not fully capture nuanced operational aspects, particularly off-chain governance dynamics, informal community interactions, or qualitative community sentiments. These off-chain processes can substantially influence DAO performance and community health, yet they remain challenging to quantify through publicly accessible metrics. Consequently, there

is potential for the empirical analysis to overlook crucial qualitative factors impacting DAO effectiveness and sustainability, limiting the generalizability of the conclusions.

Moreover, the reliance on proxy variables introduces an additional methodological limitation. For instance, using Token Holders as a proxy measure for active user participation inevitably involves certain assumptions regarding user behavior and motivations. Token ownership does not necessarily reflect active or sustained participation in governance decisions or community-building activities, potentially distorting the representation of genuine community involvement. The absence of standardized, direct measures of user engagement exacerbates this challenge, compelling researchers to rely on proxies that might not always precisely capture the targeted phenomena, thereby impacting the accuracy and reliability of the results obtained.

Furthermore, the temporal scope of the empirical analysis constitutes a substantial constraint. Given that many DAO projects remain relatively new, the observational period utilized in this research was limited. Short-term analyses inherently risk missing critical long-term implications, such as scalability issues, sustainable community engagement levels, and evolving governance dynamics, which are essential for fully understanding DAO performance and viability. Therefore, while the research provides robust insights into short- to medium-term performance, conclusions regarding long-term sustainability must be cautiously interpreted and should be subjected to future longitudinal studies to confirm their validity.

The comparability of centralized and decentralized platforms also presents inherent complexities. Although extensive efforts were undertaken to ensure methodological rigor in comparing these fundamentally different organizational structures, inherent distinctions in governance mechanisms, operational processes, and revenue-generation models can impact the direct comparability of performance metrics. Centralized organizations typically exhibit clearer, more linear governance structures and financial reporting practices, while DAOs inherently involve distributed authority and decentralized financial management practices. These structural divergences pose analytical challenges, limiting the degree to which direct comparisons can fully and accurately reflect each model's unique performance attributes.

Lastly, the current state of regulatory and legal uncertainty surrounding DAO governance remains a significant limitation. The absence of established regulatory frameworks poses

considerable challenges to practical DAO implementation. Compliance uncertainty, jurisdictional ambiguity, and unresolved legal accountability questions can deter broader adoption, complicate governance decisions, and influence DAO operational effectiveness. This regulatory instability is particularly relevant when extrapolating results beyond the research context, as different legal environments could significantly alter the feasibility and desirability of adopting DAO structures.

4.4.2 Future Research Direction

Building upon these recognized limitations, this research paves the way for several promising avenues of future investigation, essential to enriching academic discourse and practical understanding of DAOs.

Future research should particularly consider undertaking longitudinal studies and detailed qualitative case analyses. Such extended temporal and qualitative examinations would be invaluable for capturing DAO development trajectories over time, assessing scalability and long-term sustainability comprehensively. Longitudinal case studies, encompassing both successful implementations and notable failures, could offer deep insights into governance challenges, incentive mechanism effectiveness, and community dynamics, providing richer empirical evidence to guide future DAO developments.

Moreover, advancing the development and standardization of precise user engagement metrics beyond mere token ownership remains a critical research priority. Integrating advanced analytics techniques that combine on-chain data with qualitative community assessments could significantly enhance the understanding of user behaviors, motivations, and genuine participation levels within DAO ecosystems, ultimately improving both theoretical models and practical implementation strategies.

Exploring hybrid governance models that integrate on-chain automated processes with structured off-chain deliberations also offers significant potential for future research. Such models may effectively address some inherent limitations of fully decentralized structures, enhancing organizational responsiveness, efficiency, and community inclusiveness without compromising decentralization’s core benefits.

Lastly, investigating the evolving impact of regulatory frameworks on DAO adoption rates and operational practices will be critical. Comparative analyses across jurisdictions, each implementing varied regulatory approaches, can yield vital insights into best practices and regulatory impacts, guiding policymakers, businesses, and communities in navigating the complex interplay between decentralization, innovation, and regulatory compliance.

In conclusion, this research contributes meaningfully to both theoretical and practical understandings of DAOs, highlighting their significant strategic and operational potential within digital markets. Acknowledging the outlined limitations transparently reinforces the necessity for continued research efforts, ensuring that future DAO implementations can fully realize their transformative potential while navigating the complexities inherent in decentralization and digital governance.

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