# HOW BLOCKCHAIN REVOLUTIONIZES PLATFORM DYNAMICS: A MULTIPLE CASE STUDY OF DECENTRALIZED FINANCE DAPPS

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## ABSTRACT

Digital platforms are increasingly influential in the modern economy. Due to their fundamental differences from linear businesses, digital platforms present distinct challenges, such as the "chicken and egg" dilemma. The emergence of decentralized platforms built on blockchain technology, referred to as "blockchain platforms", presents an opportunity to explore alternative designs and governance models that may address these challenges. However, the extent to which blockchain platforms can effectively harness these features to overcome the inherent challenges of digital platforms remains unclear. This paper seeks to address this knowledge gap by conducting a multiple exploratory case study on decentralized applications (DApps) within the decentralized finance (DeFi) sector that adopt a platform-oriented approach to deliver financial services in Web3. The study elucidates how these blockchain platforms utilize components such as tokens, smart contracts, and decentralized coordination mechanisms to overcome the common challenges faced by conventional two-sided platforms, fostering growth without reliance on a centralized authority.

## KEYWORDS

Blockchain, platform, two-sided market, DApp, DeFi

## 1. INTRODUCTION

Major digital platform owners, including Airbnb, Amazon, Facebook, and Uber have become an integral part of everyday life, exerting significant market dominance across various sectors (Parker et al., 2016). As highlighted by Forbes' Global 2000 ranking[1], this dominance is reflected in their market capitalization, with Microsoft, Apple, Amazon, Alphabet, and Meta among the ten most valuable companies worldwide.

Due to their significant differences from linear businesses, launching and operating a digital platform presents unique challenges. Existing research highlights several key factors: achieving critical mass to trigger network effects (D. S. Evans, 2003; Katz & Shapiro, 1985), building trust among participants while managing power imbalances within the platform (Chen et al., 2021), and establishing effective governance mechanisms (Eisenmann et al., 2006; Rysman, 2009) alongside appropriate coordination strategies among economic agents (Y. Hsieh & Vergne, 2023). Additionally, determining the optimal degree of platform openness (G. Parker & Van Alstyne, 2012) and overcoming the well-known "chicken and egg" paradox – wherein the platform owner must convince both sides of the market to participate despite the absence of the other side, thereby lacking intrinsic value – (Caillaud & Jullien, 2003).

The growth of blockchain platforms provides a distinctive chance to explore alternative platform designs, decentralized governance structures, coordination mechanisms, and innovation patterns that can have a significant impact on the common challenges faced by conventional platforms. Nonetheless, the prevailing body of research frequently centers on centralized forms of platforms, offering less coverage on decentralized ones (Boudreau, 2010). Despite the increasing adoption of blockchain-based business solutions, questions remain about how they affect platform ownership dynamics (Pereira et al., 2019; Schmeiss et al., 2019). While blockchain technology promises decentralization in platform governance, how blockchain platforms can effectively utilize its inherent features to address the common challenges of digital platforms remains uncertain (Y. Hsieh & Vergne, 2023).

This paper aims to fill this gap by performing a multiple, exploratory case study on decentralized applications pertaining to the DeFi space that employ a platform-oriented approach to deliver financial services in Web3. The focus is on how these blockchain platforms leverage components such as tokens, smart contracts, and decentralized coordination mechanisms to navigate common challenges faced by traditional two-sided platforms and promote growth without relying on a centralized owner. The study also aims to provide empirical evidence that can guide future research and industry practices.

## 2. THEORETICAL BACKGROUND

### 2.1 Digital platforms and their challenges

The concept of platform has been widely adopted across industries as an innovative means of organizing a company's assets to streamline product development (Gawer & Cusumano, 2014). Platforms also create value by enabling markets where multiple customer groups can interact through an intermediary, generating cross-side network externalities (Rochet & Tirole, 2003). With the advent of digital technologies, these platforms have both established new markets and industries and disrupted existing ones (Cusumano et al., 2019). Unlike traditional linear business models, digital

[1] https://www.forbes.com/lists/global2000 [accessed in August 2024]

platforms operate within “multi-sided markets”, connecting various stakeholders, such as users and developers or buyers and sellers, thus inherently functioning in at least a “two-sided market” (Parker et al., 2016; Philipp et al., 2021).

Launching and managing digital platforms involves unique challenges. Key issues include achieving critical mass to generate network effects, establishing effective governance, and coordinating among participants. Additionally, platforms must determine the optimal level of openness and address the "chicken and egg" paradox, where both sides of the market must be attracted simultaneously despite initial low value. Table 1 provides a summary of the key challenges associated with digital platforms and the related relevant contributions.

***Table 1**: Key challenges of digital platforms and related contributions*

| Key challenge | Contributions |
|---|---|
| Network effects | e.g., D. S. Evans, 2003; Katz & Shapiro, 1985 |
| Platform governance | e.g., Eisenmann et al., 2006; Rysman, 2009 |
| Coordination mechanisms | e.g., Hsieh and Vergne, 2023 |
| Openness level | e.g., Ghazawneh & Henfridsson, 2013; Karhu et al., 2018; Parker & Van Alstyne, 2012 |
| Chicken and egg paradox | e.g., Caillaud & Jullien, 2003; D. Evans & Schmalensee, 2016; Stummer et al., 2018 |

### 2.1.1 Fostering network effects and managing power imbalances

Multi-sided platforms, often termed “matchmakers,” function as intermediaries that connect multiple market sides, typically sellers and buyers (Armstrong, 2006; Rochet & Tirole, 2003). Within platforms, network effects play a pivotal role (Katz & Shapiro, 1985), where the platform’s value to each user increases as more participants join, enhancing the overall utility for everyone involved (Parker et al., 2016; Philipp et al., 2021). To thrive, platforms must actively seek to amplify these network effects, as they are essential for achieving scale and competitive advantage Gawer & Cusumano, 2014; Parker & Van Alstyne, 2012). However, the same network effects that are vital for platform growth also drive the market toward a “winner-takes-all” scenario, where one platform often dominates the market, leading to a concentration of power in the hands of the platform owner (Rietveld and Schilling, 2021). Platform owners achieve dominance by leveraging extensive digital data to attract more users and creating lock-in effects to strengthen their market position (Gala, 2024).

This concentration of power characterizes the second phase of the internet, known as Web2 (Barassi & Treré, 2012), in contrast to Web1, which was marked by open architecture, content, and protocols (O’Reilly, 2007). The Web2 digital economy, driven by major platforms, offers significant opportunities for managers and entrepreneurs but also creates critical dependencies on these platform owners (Gala, 2024). Concerns include the growing influence of these platforms and power imbalances (Chen et al., 2021), exacerbating issues like data privacy and security, as seen with Amazon's use of seller data to compete against them (Zhu & Liu, 2018).

### 2.1.2 Coordination mechanisms and platform governance

According to Evans (2009), launching a platform involves complex coordination among various economic agents, especially when no single actor can enforce decisions (Knez & Camerer, 1994). In the digital space, this task usually falls to a “platform owner” who assumes a central orchestrating

role (Gawer, 2014). Platform owners set interaction rules, dictate behaviors, and enforce these rules, thus significantly influencing the platform ecosystem (Gawer, 2021). This aligns with traditional explanations on organizational growth, which emphasize the importance of centralized hierarchy in coordinating actors and allocating resources (Chandler, 1977; Coase, 1937; Fayol, 1949). While this centralization of power is often necessary, it can create a significant disparity between the platform owner and the users, allowing the former to potentially capture an outsized share of the value generated by the platform, often to the detriment of the users (Chen et al., 2021).

In contrast, decentralized environments, such as open-source software (Lee & Cole, 2003) and wikis (Forte et al., 2009), lack centralized control, and authority is distributed among contributors. However, these decentralized projects usually do not offer financial compensation to contributors (Dahlander & O'Mahony, 2011). Moreover, they typically do not have a market valuation because their primary goal is to produce public goods rather than generate profit. For example, Linux and Wikipedia are designed to provide shared resources for the benefit of everyone, rather than to create products or services that are bought and sold in the market, thus they do not have a market value (Y. Hsieh & Vergne, 2023).

### 2.1.3 Platform openness

In traditional platforms, managing openness is a crucial strategic challenge. According to Parker and Van Alstyne (2012), a platform is deemed more "open" when it imposes fewer restrictions on participation and development, such as through providing boundary resources like application programming interfaces (APIs), which allow third-party developers to create complementary applications (Ghazawneh & Henfridsson, 2013).

While openness can foster ecosystem growth and innovation, it also introduces risks. Excessive openness may lower user switching costs, making it easier for users to move to competitors and weakening the platform's competitive edge. Additionally, high openness can lead to increased competition through forking, where external developers create alternative versions, potentially diverting users and resources from the original platform (G. Parker & Van Alstyne, 2012). Research by Boudreau (2010) indicates that the relationship between openness and innovation often follows an inverted U-shape, suggesting an optimal level of openness that maximizes benefits while minimizing risks. Empirical studies, such as those by Laursen & Salter (2006), show that moderate openness enhances innovation and external contributions, whereas excessive openness can lead to strategic exploitation of platform resources, undermining the platform's value and stability (Karhu et al., 2018). Therefore, platform owners must balance openness to foster innovation while managing associated risks.

### 2.1.4 Chicken and egg paradox

One major challenge for platform owners is the "chicken and egg" paradox, which involves attracting participants to both sides of the market simultaneously when the platform lacks intrinsic value (Caillaud & Jullien, 2003). Platforms need a critical mass of users to generate value, yet potential users may hesitate to join without seeing that value first (Gawer, 2021).

Evans & Schmalensee (2016) identify three main strategies to tackle this: the Two-Step approach (onboarding one side to attract the other), the Zig-Zag strategy (encouraging simultaneous participation), and the Commitment strategy (requiring investment from one side before joining). Building on these, Stummer et al. (2018) propose six additional strategies: Single Target Group (focusing initially on a specific niche), Platform Staging (launching with one side and then expanding), Subsidizing (offering free access to one side, while charging the other side), Platform

Envelopment (integrating with an existing platform), Exclusivity Agreement (securing contracts with one side), and Side-Switching (allow users to engage with both sides simultaneously). Further research explores which side to subsidize. Parker & Van Alstyne (2005) discuss the role of demand elasticity, while Muzellec et al. (2015) propose a life-cycle approach for evolving platform strategies. These strategies highlight the complexity of overcoming the chicken and egg problem, emphasizing the importance of cross-side network externalities and the multifaceted nature of real-world implementation (Trabucchi, 2020).

### 2.2 Blockchain platforms: a new category of digital platforms in Web3

Blockchain has facilitated the emergence of a novel category of platforms, which disrupt some of the fundamental assumptions underlying traditional platform models (Y. Hsieh & Vergne, 2023), providing users – both buyers and sellers – greater control and a larger share of the value (Gan et al., 2023). Introduced by Nakamoto (2008), blockchain not only pioneered cryptocurrency but also established a foundational technology for decentralized consensus in a trustless environment (Chen & Bellavitis, 2020; Rico-Peña et al., 2023; Swan, 2015) sparking discussions about Web3 as a decentralized alternative to the dominant digital platforms of Web2 (Murray et al., 2023).

Web3 is envisioned as a decentralized internet iteration, relying on public blockchains to execute smart contracts and govern decentralized organizations (Murray et al., 2021). Unlike Web2, which largely depends on centralized platforms to mediate between businesses and consumers, Web3 uses automated algorithms and public blockchains, such as Bitcoin and Ethereum, to enforce trust and manage transactions (Murray et al., 2021, 2023). This approach aims to overcome the bootstrap problem of Web2, where attracting a critical mass of users is essential to compete with monopolistic platforms (Hanseth & Lyytinen, 2016).

Blockchain platforms combine the potential to harness network effects (Evans, 2003) with the aim of avoiding the creation of significant power asymmetries within platform ecosystems (Hurwicz, 2008). This, however, doesn't mean that public blockchains will completely substitute current digital platforms. Scholars (e.g., Hsieh et al., 2017) acknowledge that blockchain offers significant opportunities for existing platforms, potentially affecting business models, operations, governance, and stakeholder roles (Trabucchi et al., 2020).

A significant advantage is the use of blockchain technology to deploy smart contracts, which manage user interactions transparently and automatically without requiring a central authority. Smart contracts, defined as "programs that automatically execute when pre-specified conditions (i.e., rules) in the protocols are satisfied" (Murray et al., 2021), expand the scope of contracting, reduce costs, and drive innovation in transactions.

Blockchain introduces new monetization strategies for platforms. Gan et al., (2023) note that platforms can use token retention as a monetization method, contrasting with the usual revenue model of transaction fees. Additionally, Initial Coin Offerings (ICOs) provide a way to raise funds and generate network effects (Chen & Bellavitis, 2020). Token value appreciation can drive platform growth through token network effects (Drasch et al., 2020), and research by Erickson, (2018) shows that these effects can accelerate expansion. Bakos & Halaburda (2020) demonstrate that tradable tokens help resolve coordination issues in platform development, significantly reducing transaction costs and enhancing functionality, awareness, and acceptance.

Blockchain facilitates decentralized coordination through decentralized autonomous organizations (DAOs), which operate on a blockchain without a central authority (Beck et al., 2018; Y.-Y. Hsieh et al., 2017). DAOs support non-hierarchical governance by distributing decision-making across

network nodes, rather than relying on a single central actor (Aste et al., 2017), redefining organizational boundaries and thereby addressing issues like transparency, corruption, and excessive market power in traditional platforms (Atzori, 2015; Catalini & Gans, 2016; Lumineau et al., 2021).

Moreover, blockchain platforms enable what is known as "combinatorial innovation" (Chen & Bellavitis, 2020). Unlike centralized systems, blockchain platforms lack a controlling authority, allowing for open access and permissionless innovation. This means that developers can freely build and experiment with new applications without needing approval (Chesbrough & Van Alstyne, 2015). Combinatorial innovation thrives on this openness and the availability of open-source technologies. For instance, platforms like Bitcoin and Ethereum openly share their core technologies under permissive licenses, enabling anyone to use them as well as to build new applications on top of them. This openness fosters a faster pace of innovation and increased market competition, which can lead to the development of better and more affordable services.

All these capabilities are emerging through the creation of blockchain infrastructures like Ethereum and the development of decentralized applications (DApps) built on these platforms (Chen et al., 2021). The DApp landscape is rapidly evolving, with significant growth in decentralized finance (DeFi) in recent years (Blockchain & Web3 Observatory, 2023; Makridis et al., 2023).

The rise of blockchain-based platforms offers a unique opportunity to explore alternative designs and governance structures that address common challenges of traditional platforms. However, research predominantly focuses on centralized platforms, leaving a gap in understanding decentralized ones (Boudreau, 2010). Despite blockchain's potential for decentralization, its effectiveness in addressing traditional platform challenges remains unclear (Hsieh & Vergne, 2023). This paper aims to address this gap by investigating how blockchain elements like tokens, smart contracts, and decentralized coordination can overcome challenges faced by traditional two-sided platforms and support growth without a central owner. The research will explore these aspects to answer the following question:

*How can the inherent features of blockchain address the main challenges commonly encountered by digital platforms?*

## 3. RESEARCH DESIGN

This research seeks to explore how platforms can utilize blockchain technology to address the common challenges encountered by conventional digital platforms. Because knowledge in these areas is still limited, it's essential to collect data from individuals experiencing the phenomenon being studied (Gioia et al., 2013) within its real-life context (Yin, 1984). Given the research's focus on understanding complex phenomena (Eisenhardt & Graebner, 2007), we conducted an exploratory multiple case study (Yin, 1984) on decentralized applications (DApps) within the decentralized finance (DeFi) sector, examining how these platforms leverage blockchain technology to address common platform challenges and drive growth.

### 3.1 Case selection

Some DeFi DApps offer financial services such as token exchanges or loans, but they do not directly control the liquidity required for these services. Instead, they act as "matchmakers" (D. S. Evans, 2003), connecting liquidity providers with users who need these financial services. In this perspective, these DeFi DApps serve as "idle asset hunters" (Trabucchi et al., 2021), using a platform-oriented approach to innovate financial services. They create decentralized two-sided platforms managed by user communities, utilizing blockchain components like tokens and smart contracts to organize and

guide members toward common goals, without central authority. Two distinct categories – lending and borrowing DApps and decentralized exchanges (DEXs) – offer distinct financial services but operate through the same transactional platform model, connecting liquidity providers with end users, as illustrated in Figure 1.

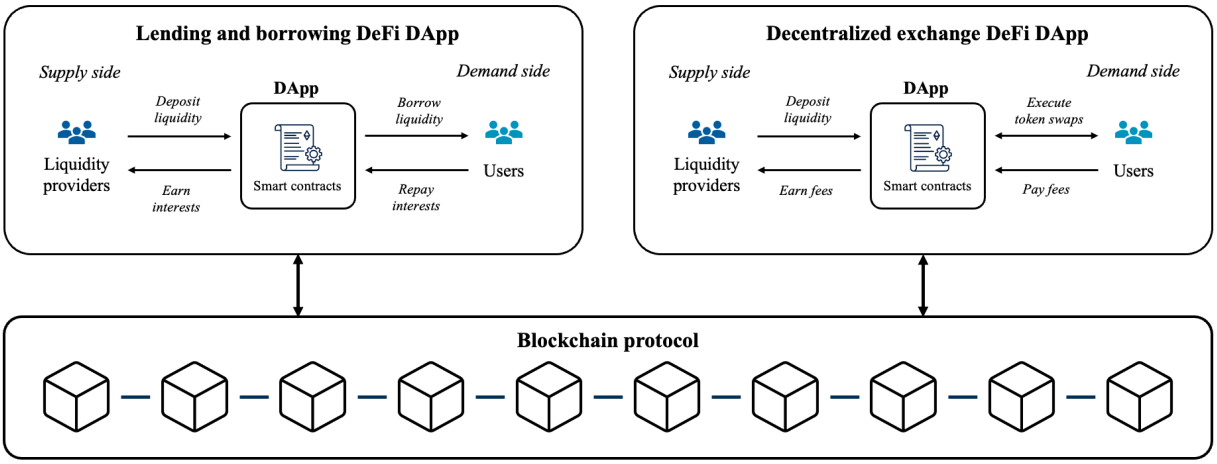


*Figure 1 – Schematic representation of the functioning of lending and borrowing, and decentralized exchange DApps*

By minimizing the role of centralized institutions, DeFi applications can lower transaction costs and foster network effects without the drawbacks of monopoly power (Catalini & Gans, 2016). In a decentralized peer-to-peer network, no single entity can dominate and exclude others, ensuring that everyone benefits from network effects and expands transaction possibilities (Huberman et al., 2019). Moreover, the concept of combinatorial innovation is particularly evident in the DeFi ecosystem, where new financial technologies serve as building blocks for future innovations, leading to new combinations and products (Chen & Bellavitis, 2020). Thus, as noted in studies by Chen & Bellavitis (2020) and Hsieh & Vergne (2023), the DeFi sector provides a valuable context for examining how heavier forms of decentralization through blockchain can transform traditional digital platforms.

To refine the framework for our study, we conducted preliminary interviews with representatives from DeFi DApps in the market. Six DApps were selected based on criteria including user base, treasury size, and community engagement. To this end we used defillama.com, a comprehensive database of DeFi DApps. Representatives from AAVE, Compound, Furucombo, Hop Protocol, PoolTogether, Sushiswap and were preliminarly interviewed to identify crucial variables, issues, and design considerations relevant to understanding the platform-oriented approach of these applications. This process helped us reframe the variables used in our analysis.

To date, a total of four interviews have been conducted with representatives from three different DApps:

- **Folks Finance** is a decentralized lending and borrowing platform that operates within the DeFi ecosystem. It utilizes smart contracts to manage and automate financial transactions, enabling users to lend or borrow assets without the need for traditional intermediaries. By offering collateralized loans and interest rate mechanisms through its smart contracts, Folks Finance aims to reduce transaction costs and increase efficiency in the lending process.
- **GoodDollar** is a decentralized platform focused on creating a universal basic income (UBI) using blockchain technology and its native token, GOOD. The platform operates by distributing GOOD tokens to users from a reserve fund managed via smart contracts. It creates a dual-sided ecosystem where one group of users receives tokens as a form of digital income, which they can use to pay for products and services. On the other side, another group of users accepts GOOD tokens as a payment method, thereby integrating these tokens into the broader economy.

- **Uniswap** is a decentralized exchange (DEX) that facilitates automated trading of cryptocurrencies through an innovative automated market maker (AMM) model. Unlike traditional exchanges, Uniswap operates without a central authority, using smart contracts to manage liquidity pools and execute trades directly between users. The platform's native token, UNI, incentivizes liquidity providers and users, thereby promoting platform growth and liquidity.

Table 2 provides a summary of the DApps and the roles of the interviewed representatives.

***Table 2**: List of respondents interviewed*

| DApp | Respondent |
|---|---|
| Uniswap | Staff Smart Contract Engineer |
| Folks Finance | Chief Executive Office |
| | Chief Marketing Officer |
| GoodDollar | Tech Lead |

### 3.2 Data collection

To minimize potential biases (Eisenhardt & Graebner, 2007) and enhance the depth of our insights (Eisenhardt, 1989), we utilized diverse sources of evidence beyond the primary data from semi-structured interviews. This encompassed secondary data drawn from reports, whitepapers, social networks, online news articles, and websites.

Data collection involved six preliminary, unstructured interviews conducted between January 2023 and May 2024 and four semi-structured interviews with Folks Finance, GoodDollar and Uniswap representatives, conducted between June 2024 and August 2024. The semi-structured interviews began with the informants providing a brief overview of their roles and positions within their respective DApps. We then explored questions aligned with our analytical framework to assess the strategies these platforms use to address common challenges. Data were collected and analyzed simultaneously, and we adapted our approach based on the insights shared by the informants. Each interview lasted at least an hour and was conducted online via tools like Microsoft Teams or Google Meet by the researchers. Additionally, all interviews were recorded and transcribed verbatim. We used an abductive approach to code the interviews.

### 3.3 Data analysis

The data analysis was conducted following established guidelines for theory building in multiple case studies, incorporating both within-case and cross-case analyses (Eisenhardt, 1989; Eisenhardt & Graebner, 2007). We adopted a qualitative inductive methodology, integrating insights from existing literature with initial interviews conducted with representatives from DeFi DApps. The interviews were systematically coded to uncover initial concepts, following an inductive approach (Saldaña, 2013). We then engaged in cross-case analysis, applying replication logic across the cases and clustering similar codes into second-order themes. We iteratively refined emerging concepts and theoretical relationships by cycling between the case data and relevant academic literature (Gilbert, 2005).

## 4. FINDINGS

Building upon existing literature on digital platforms and blockchain, our study explores the impact of the inherent characteristics and tools of blockchain technology on the crucial challenges that a platform face during its launch and growth phase. We organize our findings around four key challenges: solving the chicken and egg paradox (Caillaud & Jullien, 2003), fostering network effects (D. S. Evans, 2003), designing effective coordination mechanisms (Hsieh & Vergne, 2023), and defining the appropriate platform openness level (Karhu et al., 2018; Parker & Van Alstyne, 2012). Drawing from the key contributions from existing literature on the topic, we seek to elucidate how blockchain can impact the indicated challenges.

### 4.1 Navigating the chicken and egg paradox

The chicken and egg paradox describes the challenge digital platforms face in attracting users while creating value, as both depend on each other. To overcome this, platforms put in place methods to initiate a self-reinforcing cycle of user growth and value creation.

Differently from traditional platforms, blockchain platforms leverage Web3-specific incentive mechanisms centered around tokens to attract users. These tokens can be directly tied to the platform's economic ecosystem, with their value often linked to the platform's growth and success. By distributing tokens to early adopters, blockchain platforms provide a financial incentive that aligns with the anticipated future value of the platform. Early adopters are granted tokens, which are expected to appreciate in value as the platform grows, providing a direct financial incentive for early engagement. These tokens are awarded based on actions specific to the users' roles on the platform. For instance, liquidity providers receive tokens proportional to the liquidity they contribute, while end users may earn tokens for conducting token swaps. This incentivization strategy helps overcome initial growth barriers by encouraging early participation, thus fostering network effects before the platform reaches critical mass. Furthermore, tokens can serve as a mechanism for distributing the value created within a blockchain platform to its users, ensuring that participants benefit from a share of the economic value generated by their involvement:

> *"[tokens] allow you to also give parts of that pie to users." (Uniswap)*

Users can be attracted to blockchain platforms through Web3 marketing strategies, which involve the core development team implementing marketing actions using blockchain-based tools to incentivize participation. Examples include token airdrops[2] and NFT marketing campaigns[3], which reward users for completing specific tasks within the platform. Such campaigns are not merely intended to raise awareness of the platform's services but are designed to actively engage users and encourage their active participation:

> *"In these campaigns you don't just go for social media marketing, but you actually go to get users to try the DApp with on-chain tasks." (Folks Finance, CEO)*

The incentives driving users to complete these tasks are tied to various types of rewards. Typically, users earn tokens for their completed tasks. These tokens may come in the form of Non-Fungible Tokens (NFTs), which could represent digital collectibles or unique badges acknowledging the user's actions. Alternatively, they may be utility tokens that offer value within the platform's ecosystem,

[2] Distribution of free tokens to users, often as part of a Web3 project's marketing or promotional initiative
[3] Marketing strategies that involve the distribution of non-fungible tokens (NFTs) as reward or incentives for user engagement

such as granting whitelisting or early access to upcoming features or providing direct monetary incentives:

> *"[users] are attracted by the fact that they can win something, that they can get a token, an NFT, a cash prize or something else, or simply a whitelist for something else." (Folks Finance, CMO)*

> *"Those tokens would also be rewarding the user in long term." (Uniswap)*

Economic incentives associated with utility tokens can manifest in various forms. In the context of DeFi applications, it is customary for users to lock utility tokens to receive benefits such as reduced fees on financial services offered by the platform or to achieve enhanced economic returns from liquidity provision. This is often facilitated through mechanisms such as liquidity mining programs, which incentivize users and liquidity providers (i.e., those supplying capital) to retain their tokens for extended periods. Such programs offer increased rewards the longer tokens are locked, thereby encouraging sustained engagement with the platform.

Another significant driver of economic incentives is the anticipated future increase in the monetary value of utility tokens. These tokens are typically listed and traded on centralized exchanges (CEX) or decentralized exchanges (DEX), where their market price is determined in terms of US dollars or other cryptocurrencies and tokens.

However, the price volatility of utility tokens often attracts speculators, presenting a dual-edged challenge for the core team behind a blockchain platform. On one hand, the speculative interest generated by the utility token's launch can enhance visibility for the project and draw new users who become aware of the platform and may eventually join it:

> *"The launch of a token [also has an effect] on a marketing level; when a token is listed on major CEXs or DEXs, it generates significant visibility. So, beyond the token's intrinsic value and trading performance, the token launch attracts many new users […]. And of course, it also draws the interest of speculators." (Folks Finance, CMO)*

On the other hand, speculators may buy and sell the platform's token primarily to profit from trading rather than engaging with the platform's services. While this speculative activity is often viewed as an inevitable market dynamic, it also presents an opportunity. The core team can leverage this interest to convert some traders into active users by encouraging them to utilize the token within the platform's ecosystem while they hold it:

> *"It's impossible to avoid it; rather, you need to focus on encouraging as many conversions as possible. [...] What you should aim to achieve is converting traders into users." (Folks Finance, CEO)*

Ultimately, the introduction of a platform's token can achieve several goals and contribute to the platform's development. Tokens not only serve to reward existing users for completing specific tasks within the ecosystem but also act as an effective mechanism for attracting new users. This dual function helps to address the chicken and egg problem of building user base and activity simultaneously.

> **Proposition 1:** *Blockchain platforms solve the chicken and egg problem by rewarding early adopters with tokens for specific actions that contribute to platform growth. These tokens hold market value also outside the platform ecosystem, providing a financial incentive for early participation.*

### 4.2 Nurturing network effects through user communities

While attracting new users is crucial, particularly during a platform's initial launch phase, maintaining a steady base of active users over time is essential for the platform's sustained growth. Traditional platforms often employ strategies to enhance network externalities by creating lock-in effects, which discourage users from migrating to competing platforms. While these lock-in effects can stimulate growth, they may also diminish competition and establish long-term dependencies for users (Gala, 2024).

In contrast, blockchain platforms typically do not employ lock-in dynamics. In the Web3 environment, users maintain full control over their assets, data, and identities, which lowers the barriers to switching services (Chen et al., 2021). Consequently, lock-in strategies are less common among blockchain platforms. Instead, these platforms often focus on building user retention by cultivating communities of engaged users who are actively involved in the platform.

These communities benefit from the fundamental features of blockchain, which provide users with a tangible stake in the platform's success. Increased user engagement further enhances network effects, where the platform's value grows with the addition of more participants. This growth creates a virtuous cycle: as the user base expands, it attracts additional participants and resources, driving further platform expansion:

> *"The real difference is that, unlike traditional marketing, this is a community-driven world. Therefore, you must fundamentally start with a community" (Folks Finance, CMO)*

> *"The important thing to understand is that Web3 is built around communities. [...] We don't want low-quality followers; we want intelligent users who appreciate and follow us for a reason. They, in turn, will spread the word and contribute to organic growth. It's a slower process, but it results in higher-quality users and better user retention." (Folks Finance, CEO)*

Blockchain platforms begin engaging users during their testing phase. This is particularly crucial in the DeFi sector, where the security of the smart contracts that govern the platform is paramount, as users must lock their funds within these contracts and a critical flaw in the smart contract code could result in the loss of these funds. To mitigate risks, smart contracts are first deployed on a testnet[4], where they carry no real monetary value. This pre-launch phase helps DeFi platforms evaluate smart contract behavior in a realistic yet low-risk setting. During this period, platforms attract early adopters by incentivizing them to test the services and identify bugs. This involvement serves two main purposes: it allows users to report critical issues for resolution before the official launch and helps establish a core group of early adopters for the platform's community:

> *"Who is involved in marketing and growth have the opportunity to collect both technical feedback, which allows for improving and updating the application, and to continue expanding and growing the community." (Folks Finance, CMO)*

The significance of building a strong community is intrinsically linked to providing a high-quality service. All interviewees agreed that, for a blockchain platform – especially in the DeFi sector – providing a high-quality service is a core requirement for success. While community engagement and active user participation are important, they are not enough on their own without a robust, reliable,

[4] A trial blockchain network for development purposes, distinct from the live "mainnet", that doesn't involve real assets.

and valuable product at the center. Interviewees highlighted that a high-quality service not only attracts users initially but also maintains their interest and loyalty over time. This is particularly relevant in the competitive DeFi sector, where users have many alternatives and can easily switch platforms if they perceive a decline in service quality:

> *"You can have the best possible Web3 strategy, but if the product lacks quality, you might generate hype to get the airdrop, but after the airdrop, the hype disappears quickly and immediately, leaving you with nothing. On the other hand, you can have a high-quality product, do minimal marketing, and achieve organic growth, which is quite valuable because those are dedicated users." (Folks Finance, CEO)*

> *"If I were to launch a DEX tomorrow, what would be the most important factor in doing it better? […] As soon as the liquidity incentives run out, people might withdraw their liquidity and sell the token." (Uniswap)*

The strength of a community often mirrors the platform's ability to consistently deliver value. Users are more inclined to become advocates and contribute to community growth when they are satisfied with the service. Therefore, while community engagement is crucial for a blockchain platform's growth and resilience, it must be supported by a commitment to high service standards. Without this foundation, efforts to build and sustain a strong community are likely to be ineffective. Essentially, the success of a blockchain platform relies on a symbiotic relationship between service quality and community strength, with each element reinforcing the other.

> **Proposition 2:** *Blockchain platforms are inherently unable to leverage lock-in dynamics to create network effects. Instead, they enhance user retention through the cultivation of a community of engaged users who are actively involved with the platform.*

### 4.3 Designing effective coordination mechanisms

Launching a centralized platform involves addressing a complex coordination challenge between the platform and its users. The platform must align user interests and actions to ensure success, a task that requires considerable effort even with a central authority to make and enforce decisions. This challenge is magnified in decentralized networks, where no single entity has the authority to impose decisions. Blockchain platforms illustrate this scenario, as they are designed to transition towards a decentralized governance model, with no central authority overseeing operations or making unilateral decisions.

Initially, blockchain platforms, including DeFi DApps, often start with a centralized structure. During this phase, the development team manages the platform, enabling rapid decision-making and effective early development. As these platforms evolve, they aim to decentralize governance, gradually transferring decision-making power to users in accordance with Web3 principles of transparency and decentralization.

This transition presents a crucial trade-off between the benefits of centralization – such as efficient decision-making and streamlined development – and the advantages of decentralization, which include enhanced user participation and better alignment with community interests. While decentralization empowers users, it can also introduce inefficiencies due to the challenges of coordinating a large and diverse user base towards a cohesive development direction:

> *"The transition to a DAO will definitely not be mandatory, but it will be strongly recommended, provided that the DAO cannot completely overturn the work that has been done." (Folks Finance, CMO)*

Once governance is decentralized, the platform faces increased competition from other blockchain platforms offering similar services. The slower decision-making process inherent in decentralized governance can hinder the platform's ability to respond swiftly to market changes and maintain competitiveness. As decision-making becomes more time-consuming and reliant on consensus, the platform's capacity to innovate and adapt to market demands may be compromised, potentially giving an advantage to more centralized competitors that can operate with greater speed and efficiency:

> *"Competition is the first problem that arises. Once you decentralize, everything slows down. When you don't have the DAO you can launch features rapidly because you have the vision, we do it quickly, but in a decentralized system developments would happen at a much slower pace." (Folks Finance, CEO)*

Decentralization can also introduce significant security concerns. Governance-related attacks may occur where malicious actors manipulate proposals or gain disproportionate voting power, threatening the platform's integrity. Such attacks could enable individuals or coordinated groups to enact changes that serve their own interests at the expense of the community, such as siphoning funds from liquidity pools or altering protocol rules for unfair advantage. These risks highlight the need for robust security measures and vigilant oversight of governance processes to prevent abuse and protect users and their assets. Moreover, in the absence of a central authority, decentralized platforms must implement robust mechanisms for resolving disputes that may arise within the community:

> *"While other issues may be related to security. We have seen many attacks in DeFi, such as governance attacks, manipulated proposals where a user can gain excessive voting power, theft from pools, etc. (Folks Finance, CEO)"*

To address these challenges, blockchain platforms can implement effective coordination mechanisms by leveraging smart contracts and governance tokens to facilitate decentralized voting processes. One approach is to delegate voting power to trusted representatives, which allows for more efficient decision-making while still maintaining decentralized governance principles. Additionally, establishing a committee for dispute resolution can provide a structured method for managing conflicts and overseeing crucial functions, such as managing a multisig wallet that holds the community treasury:

> *"The main problem is how you distribute voting power, because the protocol could become manipulable." (Folks Finance, CEO)*

> *You can delegate a multisig wallet to pause the pools if there is a concern about danger. […] This way, no new loans can be taken, which are an attack vector, and no new deposits can be made (another attack vector). The only action that can be taken is to withdraw. […] [The activation of] this mode could be delegated by a DAO to a multisig wallet of the team plus an external party." (Folks Finance, CEO)*

These mechanisms are crucial for balancing the need for efficient governance with the imperative of decentralized control and user participation, ensuring that the platform remains responsive to its community while capable of sustaining its long-term development.

**Proposition 3:** *Decentralized control and user participation are essential components of DeFi DApps. Consequently, blockchain platforms must implement decentralized governance models as coordination mechanisms.*

### 4.4 Defining the platform openness level

In traditional platforms, a major challenge is determining the extent of the platform's openness. Platform owners can provide boundary resources that complementors can utilize, thereby supporting the ecosystem and aiding the platform's expansion. By offering resources such as APIs and SDKs, platform owners can give third-party developers access, allowing them to create innovative applications that build on these resources.

For blockchain platforms, being fully open offers several advantages that stem directly from the inherent characteristics of blockchain technology. These benefits are particularly evident in DeFi DApps where transparency, security, and community-driven development are fundamental principles.

Smart contracts that underlie a decentralized application are inherently open source. Since they are executed on a public blockchain, such as Ethereum or Algorand, the code is transparent, verifiable, and accessible to any external actor independently. Third-party developers can utilize these smart contracts to build applications on top of them without the platform owner needing to provide additional boundary resources.

In the DeFi sector, this behavior is neither opposed nor controlled by blockchain platforms; instead, it is often encouraged for several reasons. Firstly, it enhances cross-side network externalities. When a new application leverages the smart contracts of an existing DeFi DApp, it increases the usage of those foundational smart contracts. This, in turn, encourages liquidity providers to deposit more funds, thereby increasing the perceived value for end users. As a result, a larger user base on both sides leads to more transactions on the blockchain platform, which ultimately boosts the platform's revenue:

> *"If a developer creates a tool using Folks' lending smart contracts, there will obviously be more liquidity on Folks. This means there will be more lending opportunities. You want as many people as possible to build on top of it because it simply results in more revenue." (Folks Finance, CEO)*

Platform openness also plays a crucial role in enhancing security. When external developers adopt or fork the smart contracts of a DApp, they essentially subject the code to a testing process in diverse environments beyond those initially envisioned by the original development team. This broader scrutiny helps to identify potential vulnerabilities or inefficiencies that might not have been detected in the original context, thereby improving the overall robustness of the smart contracts. In the case of DeFi applications, where smart contracts often manage substantial amounts of users' funds, this process is particularly critical. By allowing the code to be openly examined and tested by the wider developer community, flaws can be detected and addressed more quickly, reducing the risk of exploits and increasing the security and reliability of the platform:

> *"You also want people to fork it to improve it, so you can see how the software performs, learn from others, and have public APRs so that other people can enhance the software. Open bug bounties, and so on. This aligns with the DeFi philosophy of having everything open source and public." (Folks Finance, CEO)*

> *"In my opinion, web3 encourages a market where it is more difficult to build a monopoly." (Uniswap)*

> *"The fact that someone can take that ready-made code and use it is the only way to truly develop these products." (Folks Finance, CMO)*

Finally, it is crucial to emphasize that code openness and transparency are core values of Web3, which DeFi DApps strive to uphold:

> *"It must be done. […] You can't have DeFi users on Ethereum if you're not open source; you won't even attract users. They will abandon you because the community demands this." (Folks Finance, CEO)*

Beyond the operational benefits discussed, developers of blockchain platforms pursue high levels of openness because it aligns with the strong advocacy of the user community. This focus on openness is particularly relevant for Web3 applications, where transparency and active user participation are considered vital to the platform's success and legitimacy.

> **Proposition 4:** *Blockchain platforms are inherently more open and encourage third-party developers to freely build upon their publicly available smart contracts to foster "combinatorial innovation" and improve security through community-driven development and code scrutiny.*

## 5. DISCUSSION

Our findings offer important insights into the concept of blockchain platforms and illustrate how certain inherent features of the technology, along with blockchain-enabled tools, can significantly influence the common challenges encountered by traditional digital platforms. While blockchain platforms are not immune to these challenges, they capitalize on the intrinsic characteristics of blockchain to address these issues in unique ways. Through a multiple case study analysis, this study seeks to contribute to the ongoing discourse by providing empirical evidence on how blockchain platforms, particularly within the DeFi sector, navigate and respond to these challenges.

Among the challenges faced by digital platforms, the chicken and egg paradox is one of the most extensively studied issues in the literature. However, there is a notable lack of research specifically addressing this problem within the context of blockchain platforms. Our findings are consistent with Drasch et al. (2020), and Erickson (2018), who suggest that platforms can utilize tokens to advance development and generate token-based network externalities. Specifically, we argue that token distribution can act as a strategic mechanism for blockchain platforms to address the chicken and egg problem. By offering early adopters a stake in the platform's financial success, tokens incentivize these users to contribute to the platform's growth and adoption. As the platform matures and its user base expands, the value of the tokens generally increases, thus rewarding early participants and reinforcing their commitment to the platform. This strategy not only facilitates initial traction but also promotes sustained growth and engagement within the ecosystem.

Creating a community that is deeply engaged with and passionate about the service provided is a crucial element for the success of blockchain platforms. Unlike traditional platforms, where user retention might rely on lock-in strategies, blockchain platforms thrive on the active participation and commitment of their users. In the Web3 ecosystem, where users retain full control over their assets, data, and identities, the barriers to switching to competing services are minimal. Consequently,

blockchain platforms must prioritize the cultivation of a loyal community that not only appreciates the service but is also actively invested in its success.

In line with Beck et al. (2018) and Hsieh et al. (2018), we found that these communities often take the form of DAOs, which allow communities to self-coordinate as custodians of the platform's "commons", similar to decentralized settings in open-source software (Lee & Cole, 2003). However, unlike traditional open-source projects that typically do not compensate contributors or generate market value (Dahlander & O'Mahony, 2011), DAOs incentivize contributors and enable the platform to achieve significant market valuations (Hsieh & Vergne, 2023).

Launching a blockchain platform involves navigating the complexities of coordination between the platform and its users, a challenge that is especially pronounced as these platforms transition from centralized to decentralized governance. Initially, platforms often begin with a centralized structure to enable rapid decision-making and efficient early development. However, as they evolve, they aim to decentralize governance, transferring decision-making power to users – in line with Web3 principles of transparency and decentralization. This transition introduces a significant trade-off: while decentralization enhances user participation and aligns with community interests, it can also lead to inefficiencies in decision-making and increase security risks. The slower, consensus-driven processes may hinder the platform's ability to innovate and respond swiftly to market changes, potentially giving an edge to more centralized competitors. Moreover, decentralized governance can expose the platform to governance-related attacks, underscoring the need for robust security and dispute resolution mechanisms. To mitigate these challenges, blockchain platforms can implement effective coordination strategies, such as delegating voting power to trusted representatives and establishing committees for dispute resolution.

In traditional platforms, a key challenge is determining the optimal level of openness, balancing its benefits with the risks involved (Boudreau, 2010; Parker & Van Alstyne, 2012). In contrast, blockchain platforms inherently embrace openness by making the code of their smart contracts publicly accessible. This openness reverses the dynamics observed in traditional platforms, where access to core functionalities is often restricted. In blockchain platforms, the public availability of smart contract code fosters "combinatorial innovation" (Chen & Bellavitis, 2020), enabling external developers to build on the existing code base and enhance the platform's ecosystem. Instead of fearing competition, as in centralized settings, blockchain platforms operate within a collaborative development model characteristic of Web3. Thus, openness is not merely a strategic choice but a fundamental principle driving blockchain platforms' growth and evolution. Our findings suggest that, especially in the context of DeFi DApps, platform openness also serves as a decentralized form of security assurance, leveraging the community's collective expertise to continuously improve and secure the platform's core smart contracts.

## 6. CONCLUSIONS

The current study examines how the inherent features of blockchain technology influence the key challenges faced by digital platforms during their development. In particular, we have organized our findings around four major challenges frequently discussed in platform literature, emphasizing the unique elements or strategies employed by blockchain platforms to address these issues. To the best of our knowledge, this perspective remains relatively underexplored in academic literature, especially from an empirical standpoint. From a practical perspective, our findings provide valuable insights both for individuals managing the development of blockchain platforms and for established platforms aiming to leverage blockchain technology to drive innovation and expansion.

However, this study presents some limitations that may suggest avenues for further research. Firstly, the generalizability of the findings may be constrained by the specific focus on DApps within the financial sector. Examining DApps that provide different services employing a platform-oriented approach in other sectors could yield additional insights. Additionally, our study does not differentiate between the various stages of DApps' lifecycle. Specific challenges may be more pertinent to the initial launch phase (e.g., the chicken and egg paradox), while others may emerge in later development stages (e.g., determining the level of openness). Future research could focus on a longitudinal analysis of DApps throughout their lifecycle. Lastly, the study is based on only four semi-structured interviews with representatives from DeFi DApps. Further interviews will be conducted to validate and refine the insights gained from this initial phase of the research.

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