TECHNOLOGY

Blockchain Technology and the Rise of Decentralized Blockchain Platforms

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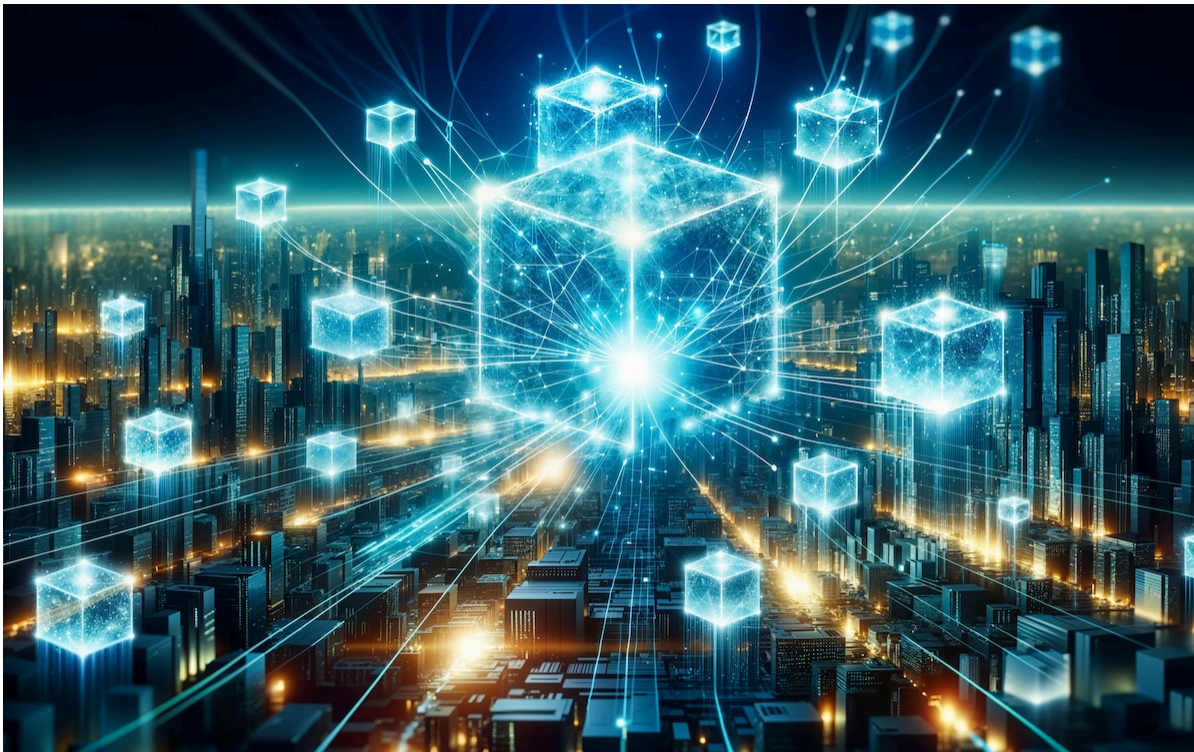

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Platform businesses must stay aware of the growing shift toward decentralization driven by blockchain technology.

☑ **INSIGHT | FRONTIER**   19 Dec 2024

Introduction

Digital platforms are market intermediaries facilitating social connections and economic transactions and ecosystem aggregators regulating value creation and consumption.[1] Over the past decades, digital platforms have empowered various new products and services that have greatly improved people's lives and become the foundations for numerous new business models. However, successful digital platforms tend to become monopolies as they develop strong network effects and economies of scale and scope.[2]

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Conventional platform owners control the foundational platforms and have become the architects and governors of the ecosystems. These platforms can enjoy considerable power and authority in enacting and enforcing the rules of access and conduct in platform ecosystems.[3] They can unilaterally decide who can access their platform ecosystems, what platform participants can and cannot do, and how to allocate economic surplus. Leveraging their unique power and positions, platforms can extract value from users, complementors, and business partners, resulting in the unfair distribution of economic

and social gains on platform ecosystems.[3] As providers of essential digital services, platforms can even demand users to sign unilateral end-user license agreements to give up personal data and negotiation power.

Stakeholders have become increasingly concerned with the roles of platform owners in platform ecosystems and have explored potential ways to contain conventional platforms' power.[2] Recognizing the fundamental power imbalance,[4] stakeholders have considered a top-down approach to restrain the owners through regulations and policies.[5] However, such an approach requires regulators to have complete information to enforce timely and effective policies to deal with ever-changing platform.[6] Although policymakers can address common problems surrounding digital ecosystems, they are unlikely to pay sufficient attention to localized issues concerning specific and dynamic platforms. As Ostrom[7, p.3] suggests, "If the individuals who are crafting and modifying rules do not understand how particular combinations of rules affect actions and outcomes in a particular ecological and cultural environment, rule changes may produce unexpected and, at times, disastrous outcomes." When rules are inappropriate, heavy regulations can distort incentives, hindering entrepreneurship and innovation.

Blockchain's development has offered the technological infrastructure to distribute decision rights among users and govern platforms in a decentralized structure.[8] As Bardhan[9, p. 202] suggests, "control rights in governance structures should be assigned to people who have the requisite information and incentives and at the same time will bear responsibility for the (political and economic) consequences of their decisions." Blockchain allows members to collectively govern the system without the interference of platform owners.[10] It facilitates interactions and transactions with pre-coded algorithms (or smart contracts), which have conditions to set the rules for all members. Such a decentralized structure engages users in decision-making, allowing fair evaluations of individual interests. In this paper, we aim to theoretically examine the distribution of decision rights and the implementation of the decentralized decision-making structure within blockchain platforms.

Decision Rights and Decision-Making Structures

The seminal work of Weill[11] discusses the concept of IT governance, highlighting the key element of decision rights. In general, decision rights describe the power to control resources within organizations, which has been studied in various dimensions. For instance, Fama and Jensen[12] theorize the duality decision rights of management rights, which are the authority to propose and implement changes, and control rights, which focus on task responsibility such as ramification and monitoring. IT governance literature has also considered the decision-making structures. These structures depict the context to achieve various subjects and facilitate effective decision-making. It is a spectrum between centralization and decentralization, or as discussed in Weill and Ross,[13] six archetypal approaches that range from feudal arrangements to anarchies. Therefore, Beck, Müller-Bloch[14] describe decision rights as they "determine the degree of centralization".

Conventional organizations rely on centralized decision rights among managers to ensure operation efficiency and lower business costs.[13] However, this unequal distribution of power also raises concerns. Platform owners manage and control centralized platforms, enjoying absolute governance control and decision-making authority in platform ecosystems.[14] This reliance on platform owners may be acceptable if they have the right incentives and the requisite knowledge to design, develop, operate, and govern digital platforms to maximize the shared good.[15] However, in most cases, platform owners often have their interests, agendas, limitations, and blind spots. They face informational and cognitive constraints that may lead them to accidentally implement policies and changes that can hurt themselves and platform participants.

Decision Rights and Decentralized Blockchains Platforms

The efficacy of decentralized governance rests on solving the problems of institutional supply, credible commitment, and collective monitoring.[6] As foundational technologies, blockchain technologies and smart contracts provide the affordances to help address these problems. First, they help solve the problem of institutional supply by distributing decision rights to entrepreneurs to experiment with alternative decision-making structures and mechanisms.[14] They reduce the cost of developing new institutions for collective actions, as entrepreneurs can draw on public blockchains, existing templates, and open-source code to create new platforms and ecosystems. Moreover, they offer strong incentives for developing new mechanisms and ecosystems, as entrepreneurs earn rewards through digital tokens.[16]

Second, blockchain helps with the problem of credible commitments. Through blockchain technologies and smart contracts, the institutions for collective action become self-enforcing.[8] Blockchains and smart contracts transparently define operational rules governing day-to-day operations. Every stakeholder strictly follows the same set of rules that cannot be arbitrarily modified. In times of rule changes, a decentralized ecosystem requires broad consensus among key stakeholders to enact changes, generally ensuring the stability of the rule system.[6,7]

Third, they help solve the problem of collective monitoring. On decentralized platforms built on blockchain technologies, public ledgers record every transaction and are publicly observable by all stakeholders.[16] Every participant can keep a full copy of the blockchain with a complete record of all transactions. Even without running a full note, any user can access the blockchain to obtain the full details of all transactions. As a result, stakeholders can monitor all transactions, all accounts, and all tokens.

Overall, blockchain technologies and smart contracts have helped solve the problems of supply, commitment, and monitoring to facilitate decentralized governance. Through decentralized governance, decentralized platforms allow key stakeholders to retain decision rights to modify operational rules, following the structure and process of rule changes defined by collective action and constitutional rules.[6,7] Generally, decentralized platforms may implement formal voting or informal voice processes to allow key stakeholders to shape platform design and evolution.[14] Through decentralized governance, decentralized platforms improve informational efficiency and incentive compatibility in the governance processes, contributing to the pursuit of socially desirable outcomes.

Potential Challenges of Blockchain Platforms' Decentralization

Accountability

In most centralized platforms, platform owners must ensure the quality of the products and services in the platform ecosystems. They regulate entry, conduct, and outcomes to maintain the health of platform ecosystems. The owners reward good actors and penalize malicious behaviors. They are accountable when things go wrong and can be relied upon to make things right. On centralized platforms, therefore, platform owners are accountable for their platform ecosystems.[17]

On the other hand, decentralized platforms may facilitate "illegal and/or immoral transactions by facilitating transactions without intermediaries who can personally be held accountable for those transactions".[18, p. 351] Accountability is diffused since no central entity fully controls decentralized platforms. As a result, who has the ultimate accountability? How can we ensure the quality of products and services on decentralized platforms? Who should be liable for wrongdoings? These are all difficult questions that must be addressed.[18]

Generally, a party causing harm on a decentralized platform should be held directly accountable for its actions and consequences.[14] If a user uses cryptos for illicit activities, the user should be directly held accountable for the wrongdoing. Likewise, if a third party builds a defective financial product on blockchains and causes harm, it should be held accountable for the defective product and the harm. It is essential to penalize bad actors when things go wrong to ensure the well-functioning of decentralized ecosystems.

Coordination

On centralized platforms, platform owners coordinate platform development, operations, and governance.[17] However, decentralized platforms need platform owners to coordinate large and heterogeneous groups (e.g., developers, operators, and users) with formal contractual relationships with the platforms (e.g., developers, operators, and users) without formal contractual relationships with the platforms.[7] Moreover, any participants can join and leave an ecosystem at will, making coordination especially challenging. Without a platform owner, how can platform participants achieve effective coordination? Who should be responsible for effective coordination?

Decentralized platforms, despite their challenges, have innovatively tackled the coordination of operations, governance, and development. One key mechanism they employ is machine consensus, a process often used to coordinate operations.[14] This involves motivating independent operators to participate in decentralized operations through machine-enforced consensus protocols and built-in incentive mechanisms. These platforms also coordinate operations through operational rules written into their software code. However, this approach raises the question of designing code-based coordinating mechanisms and adapting the code when necessary, often through decentralized governance.[10]

Decentralized platforms often rely on open-source communities to carry out decentralized development.[3] They encourage voluntary developers to leverage their local information and knowledge to contribute to their continued technical development. Often, they reward their key contributors through platform-specific tokens to enhance incentive

compatibility.[19] In open-source development, coordination is often achieved through discussion and consensus, giving voluntary developers more power and control over the process. Furthermore, community leaders may emerge in open-source communities to help coordinate development activities. Nevertheless, community leaders are not appointed but often emerge through their technical and organizational contributions. Overall, much work remains to be done to enhance decentralized coordination mechanisms' incentive compatibility and informational efficiency.

Value Creation and Capture

Decentralized platforms must create real value for end-users to succeed in the long run. Most end-users are concerned primarily with getting their jobs done,[20] so decentralized platforms should help users accomplish their tasks more effectively than competing offerings. Nevertheless, it would be unrealistic to expect decentralized platforms to be more effective than existing platforms in satisfying user demands where centralized platforms are already prospering. Instead, decentralized platforms should focus on use cases in which current platforms fail. In these use cases, decentralized platforms may help remove barriers preventing usage and dedicate their services just for such scenarios.

Decentralized platforms also have to deal with value capture and value distribution. Many decentralized platforms capture value by charging fees to process transactions. They then try to distribute the gains to their communities fairly. Decentralized platforms often do so through platform tokens. Often, decentralized platforms issue platform-specific tokens and sell them to the public to raise funds, distribute tokens to stakeholders to incentivize contributions, and retain them to support their continued development.[19] Nevertheless, challenges abound. It is unclear how tokens should be created, structured, and distributed in a manner that encourages long-lasting value capture and value creation. For instance, how much value should users, developers, operators, and investors capture? What should determine how much each stakeholder gets? How should decentralized platforms support continued development? How should development funds be managed? Many more studies are needed to help address these important questions.

Potential Paths for Blockchain Platforms

New decentralized platforms can grow alongside centralized ones, increasing the proportion of decentralized platforms in the platform economy. Blockchain technologies have become the foundations for launching decentralized platforms that require limited or no involvement from a central entity. In addition, platform-specific tokens offer economic mechanisms that allow entrepreneurs and innovations to raise funds to support early-stage technical development. Also, tokens align the incentives of all stakeholders to help grow early-stage platforms. Overall, blockchain technology and tokens have facilitated the creation of decentralized platforms.[14]

Over the years, entrepreneurs and innovators have leveraged blockchain technologies and cryptocurrencies to create decentralized platforms for financial services, digital payments, marketplaces, and beyond. One key characteristic of blockchain platforms is that they are controlled not by platform owners but by community members. As a result, any entity can acquire digital tokens and join a decentralized financial ecosystem anytime without permission, build applications on top of the platform, leverage the ecosystem's network effects to drive growth and participate in shared governance. Another key characteristic of decentralized financial platforms is that they often make their source codes publicly available. Open-source codes and public ledgers allow external stakeholders to evaluate platform fairness and integrity, contribute to continued developments, and leverage existing codebases and ledgers to launch new products and services. Importantly, they have experimented with novel decentralized business models that leverage digital tokens to raise funds, capture value, incentivize key stakeholders, and govern open ecosystems.

Conclusion

The rise of the platform economy has brought enormous values to society, and our lives are often much better off with digital platforms. Nevertheless, our current platform economy experiences significant challenges related to the concentration of decision rights and

wealth on a small number of platform owners. The growing power imbalances and wealth inequality can be problematic and should be addressed. The recent emergence of blockchain technologies points to decentralization as an alternative vision for a more platform economy. Decentralization may allow key stakeholders to reclaim their decision rights in the platform to pursue shared interests and socially desirable outcomes. Nevertheless, decentralized platforms may face various challenges. Accommodating institutions and regulations can promote responsible innovation, maximize the unique strengths of decentralized platforms, and minimize potential downsides. Should decentralized platforms continue to take root, they may usher in a platform economy that can better leverage individual incentives and local information to improve well-beings while promoting decentralized power, permissionless innovation, and the collective good. Should decentralization progress, it may offer an alternative vision for a platform economy where digital platforms can create social and economic benefits without incurring substantial monopoly costs.

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