Author/s:
Ciriello, RF;Marx, J;Cheong, M;Mueller-Bloch, C;Mathiassen, L

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CATCHWORD

Decentralized Social Media

Raffaele F. Ciriello · Julian Marx · Marc Cheong · Christoph Mueller-Bloch · Lars Mathiassen

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1 Introduction

Social media – global-scale sociotechnical systems supporting interpersonal and community-based communication, collaboration, and information sharing (Ciriello et al. 2025b) – have become a cornerstone of modern society, connecting billions worldwide and shaping public discourse (Kane et al. 2014; Leonardi and Vaast 2017; Weiler et al. 2022). However, their growth has been marred by controversies, including privacy breaches, disinformation, psychological harm, and societal polarization (Braghieri et al. 2022; Kim and Dennis 2019; Kitchens et al. 2020). Recent developments, like Mark Zuckerberg's decision to scale down fact checking from Meta, and Elon Musk's support for far-right extremists on X (formerly Twitter) highlight the risks of relying on corporations – often unilaterally controlled by a single CEO – that may priorities profit over public interest or abandon essential services when unprofitable (Ciriello et al. 2025a). These challenges highlight the urgent need to critically examine social media's governance models.

In response, *decentralized social media* (DSM) has emerged as a potential alternative, offering a distributed network architecture that employs federated open-source protocols to support user stewardship, transparency, and equitable value distribution. Unlike centralized social media (CSM) platforms such as Facebook, X, and YouTube, which may monetize user data non-consensually (Zuboff 2023) and rely on proprietary algorithms for content dissemination (Riemer and Peter 2021), DSM platforms enable cooperative governance models that promote participatory decision making, open-source algorithms, and equitable value distribution (Larimer et al. 2017; Liu et al. 2022). Despite its promises, however, DSM remains niche compared to dominant CSM platforms. Mastodon (10 million users), Bluesky (27 million users), and Steem (3.5 million users) are dwarfed by Facebook (3 billion users), YouTube (2.5 billion users), and TikTok (1.5 billion users) (Cooper 2025; MastodonAnalytics 2025; Statista 2025b; SteemBlockExplorer 2025). Although some DSM platforms are rapidly gaining traction – Bluesky grew from 1 to 27 million users in a single year, reflecting broad interest in decentralized alternatives (Burgess 2024) – broader adoption remains constrained by scalability limitations, governance inefficiencies, and usability challenges (Sedlmeir

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R. F. Ciriello (✉)
University of Sydney, Sydney, Australia
e-mail: raffaele.ciriello@sydney.edu.au

J. Marx · M. Cheong
University of Melbourne, Melbourne, Australia
e-mail: j.marx@unimelb.edu.au

M. Cheong
e-mail: marc.cheong@unimelb.edu.au

C. Mueller-Bloch
ESSEC Business School, Paris Cergy, France
e-mail: muellerbloch@essec.edu

L. Mathiassen
Georgia State University Atlanta, Atlanta, GA, USA
e-mail: lars.mathiassen@ceprin.org

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et al. 2022; Thibault et al. 2022). Additionally, DSM struggles with financial sustainability, often relying on community funding or token incentives rather than the advertising-driven economies of CSM.

CSM and DSM are best seen as points on a spectrum rather than binary opposites. While CSM platforms, such as Facebook and YouTube, are scalable and efficient, enabling rapid decision making and optimized user experiences, their centralized control often leads to monopolistic practices, limited transparency, and cultural insensitivity (Horwitz 2021; Tyler et al. 2021). In contrast, DSM platforms, such as Mastodon and Steem, promote greater transparency and user stewardship but face challenges, including coordination inefficiencies, slow decision making, and power imbalances among influential users. Hybrid models like Bluesky, which combine open-source protocols (e.g., the AT Protocol) with centralized oversight, aim to balance these trade-offs by blending CSM's efficiency and scalability with DSM's user stewardship and transparency (Burgess 2024). This spectrum highlights opportunities to mitigate CSM's monopolistic risks while addressing DSM's scalability and governance challenges, offering a nuanced perspective on evolving social media governance models.

We propose *user stewardship* – users' ability to manage their digital data, content, identity, and participatory rights, either directly or via delegated agents aligned with their values – as a critical alternative to the corporate custodianship characteristic of centralized models (Gregory et al. 2022; Hess and Ostrom 2006). A core problem with CSM is their reliance on platform lock-in (Sunyaev et al. 2021; Weiler et al. 2022), which directly conflicts with user stewardship: Corporate platforms profit as users become dependent on proprietary data, content, and algorithms. With fiduciary duties to shareholders and business models dependent on advertising – which makes up 99% of Meta's US$165 billion annual revenue (Statista 2025a) – users effectively become the product, rather than the customer. Ownership and control over user data, content curation, and engagement interactions lie with entities whose commercial incentives may conflict with user well-being. This structural asymmetry undermines users' capacity to act as stewards of their digital presence.

The rise of DSM echoes the broader Web3 movement, which envisions a decentralized Internet built on blockchain technology, offering censorship resistance, user stewardship, and participatory governance (Ethereum Foundation 2024a, b; Linux Foundation 2024a, b; Ray 2023). While this shift presents an opportunity for the Information Systems (IS) discipline to study alternative social media governance models, it remains unclear whether DSM will become dominant or remain niche. This Catchword article explores DSM's potentials and risks, comparing its governance model to CSM and highlighting key challenges such as scalability, financial sustainability, and power balancing. By discussing DSM's pros and cons, we provide a critical perspective on its future, inviting the BISE community to engage with this evolving phenomenon.

We proceed by examining the key distinctions between decentralized and centralized social media and discussing their respective challenges and opportunities regarding ownership, value appropriation, content moderation, incentives, and coordination (Sect. 2). Next, we outline a BISE research agenda for DSM, highlighting key questions across governance, management, and engineering (Sect. 3). We conclude by discussing the broader implications of DSM and summarizing key takeaways (Sect. 4).

2 Decentralizing Social Media: Challenges and Opportunities

This section examines key differences between CSM and DSM across core dimensions, as summarized in Table 1 and with DSM-specific definitions in Table 2. By outlining these distinctions, we highlight opportunities and challenges as a foundation for future research.

2.1 Architectural Model

DSM and CSM platforms operate within distinct architectural models, shaping their governance, scalability, and user participation structures. While individual platforms such as Facebook and Steem may exhibit variations from the typical models, the key features outlined below are present in most cases. Additionally, hybrid forms incorporate aspects of both centralized and decentralized architectures to balance efficiency, scalability, and user control. Figure 1 illustrates the key differences between the two architectural models.

On the left, CSM is depicted as a monolithic structure controlled by a single corporation (e.g., Meta, Alphabet, ByteDance, X), where all critical components – software, data, algorithms, and servers – are proprietary. Governance is centralized under a single CEO (e.g., Mark Zuckerberg, Elon Musk), and users access services through a cloud-based interface without direct influence over platform policies. This hub-and-spoke model ensures efficiency and scalability but also creates vulnerabilities, such as reliance on a single authority, risks of censorship, and limited user participation in decision making.

On the right, DSM follows a federated open-source model, where social networks consist of interconnected subnetworks rather than a single hub. These subnetworks (or instances) can federate to enable communication across

Table 1 Key differences between centralized and decentralized social media

Dimension	Centralized social media	Decentralized social media	Key sources
Architectural model	Monolithic, proprietary platforms where a single entity controls software, data, servers, and algorithms, ensuring scalability but limiting transparency and user participation	Federated or blockchain-based networks where control is distributed, enabling modularity, censorship resistance, and community-driven governance but introducing coordination challenges	Beck et al. (2018) and Ciriello et al. (2018)
Ownership, stewardship, and control	Concentrated within profit-driven companies and their shareholders, enabling unilateral decision making on policies, data management, and content moderation	Distributed among user communities, enabling user stewardship – direct or delegated oversight of data, content, and participatory rights – via open-source protocols or blockchain mechanisms	Alizadeh et al. (2023) and Mindel et al. (2018)
Value appropriation	Primarily concentrates benefits among corporate shareholders through targeted advertising and data monetization. While some platforms share fractions of the revenue with creators (e.g., TikTok, YouTube), these programs remain controlled by the corporate entity	Primarily distributes benefits among users based on contribution and engagement, often through mechanisms like revenue-sharing or token-based rewards. Simpler models rely on community-driven incentives, emphasizing equitable value distribution	Beverungen et al. (2015) and Mindel et al. (2018)
Expression moderation	Moderation is typically enforced by appointed experts with proprietary algorithms, ensuring consistency but raising concerns about bias, censorship, and freedom of expression	Moderation is community-driven, rewarding users for content validation and enhancing censorship resistance. However, inconsistent enforcement and power imbalances among users pose challenges	Klonick (2018) and Tyler et al. (2021)
Incentive structures	Incentives are primarily non-financial, such as social validation and intrinsic motivation, driving user engagement. Financial rewards for creators (e.g., TikTok, Twitch) are limited and tightly controlled	Incentives are often extrinsic, such as token-based rewards or algorithmic marketplaces, enabling earnings and portable social graphs. Simpler models use intrinsic motivators (e.g. reputation scores). Balancing both remains challenging	Alizadeh et al. (2023) and Thelwall (2017)
Coordination	Centralized entities coordinate operations, enabling efficient decision making and scalability but introducing risks like single points of failure and monopolistic practices	Coordination is distributed among users through federated open-source protocols or blockchain mechanisms, promoting transparency and resilience but often at the cost of slower decision making and governance inefficiencies	Malone and Crowston (1994) and Mindel et al. (2018)

platforms while maintaining local autonomy. Unlike CSM, DSMs rely on open-source protocols, where data, software, and algorithms may be shared, modified, or operated by all participants. Some users, organizations, or institutions may run their own servers, increasing network resilience and reducing dependency on a single controlling entity. This governance model allows diverse actors – including individual users, witnesses, corporations, non-profits, governments, and international standardization organizations – to play a role in shaping DSM policies. This enhances transparency, enables cross-platform data portability, and reduces reliance on centralized authorities.

A key feature of DSM is participatory governance, where users contribute to platform moderation and decision making. Certain platforms introduce roles such as witnesses, who oversee integrity and moderation. Community-based moderation mechanisms, such as flagging, allow users to collaboratively regulate content. Rate-limited weighted voting – an algorithm that adjusts user influence based on stake while curbing exploitation – adjusts voting power based on engagement and reputation. Reputation scores (represented by stars) differentiate user influence, while stake-based governance assigns different levels of decision-making power to "whales" (powerful stakeholders) and "minnows" (marginalized stakeholders) (Ciriello et al. 2018). Optionally, DSM may integrate a distributed ledger, where cryptography and blockchain-based consensus facilitates content immutability and token rewards (Beck et al. 2018).

2.2 Ownership, Stewardship, and Control

Ownership, stewardship, and control are central to social media governance, influencing platform policies, user experience, and social dynamics. In traditional corporate governance, ownership refers to rule-making authority, while control involves implementing and interpreting these rules in daily operations (Berle and Means 1932; Fama and Jensen 1983). CSM concentrate ownership and control within corporations, enabling unilateral decision making on policies, data management, and content moderation (Beverungen et al. 2015; Mindel et al. 2018; Tyler et al. 2021). This model prioritizes shareholder value, leveraging algorithmic content dissemination and advertising monetization, while offering users mostly non-monetary rewards for engagement (such as social validation through "likes")

Table 2 Glossary of key concepts in decentralized social media

Concept	Description	Key sources
Incentive Mechanism	Sociotechnical features used in DSM, often including cryptocurrency rewards and reputation scores, that motivate user participation, engagement, and contribution	Guidi (2020) and Liu et al. (2022)
Tokenization	The process of converting platform ownership, engagement data, and content into digital tokens, which facilitate both value distribution and governance	Alizadeh et al. (2023)
Cryptocurrency Rewards	Financial incentives offered to users for contributing content or participating in the platform, enabled by blockchain technology	Thelwall (2017)
Reward Pool	A collective fund from which cryptocurrency rewards are distributed to users for their contributions, as decided by community voting	Delkhosh et al. (2023) and Liu et al. (2022)
Rate-Limited Weighted Voting	A community-based content curation system that limits each user's influence based on their stake in the platform and incorporates measures (such as daily voting caps or diminishing voting power) to prevent exploitation	Ciriello et al. (2018) and Larimer et al. (2017)
Reputation Score	A mechanism that evaluates and displays the credibility and influence of users within the platform, typically determined through community voting on content, often affecting their potential earnings and content visibility	Alizadeh et al. (2023) and Liu et al. (2022)
Censorship Resistance	The ability of DSM platforms to resist external pressures to remove or alter user-generated content, often enabled through blockchain's de-facto immutability, thus ensuring freedom of expression while complicating the prevention of abuse	Ciriello et al. (2018) and Larimer et al. (2017)
Social Graph Portability	The ability to transfer one's reputation score, token stake, and network of relationships from one platform to another without losing value, thus enhancing user stewardship and reducing platform dependence while raising challenges for economic viability and sustained competitive advantage	Ciriello et al. (2024) and Ciriello et al. (2018)
Witnesses	Elected user representatives in DSM platforms who play an important role in key governance decisions (e.g., validating transactions, changing the protocol), ensuring integrity and adherence to community rules	Guidi et al. (2021a) and Guidi et al. (2021b)
Whales and Minnows	Users with significant (whales) or minimal (minnows) stakes in the platform, indicating their influence on voting, earnings, and decision making	Ciriello et al. (2018) and Guidi et al. (2021b)
Federated open-source protocols	Free-to-use, publicly viewable and modifiable software that enables social media platforms to operate, allowing the user community to control data and algorithms while participating in a shared network. The "many eyes" principle (Linus' law) allows the global community of developers to quickly spot and fix vulnerabilities	Ciriello et al. (2025a)
User Stewardship	The capacity of users to manage, protect, and oversee their digital data, content, identity, and participatory rights. Stewardship may be enacted directly (direct stewardship) or assigned to algorithmic or human agents acting on the user's behalf (delegated stewardship). It emphasizes custodial responsibility and alignment with user-defined values, distinguishing itself from ownership (legal rights) and autonomy (freedom from external control)	Gregory et al. (2022) and Hess and Ostrom (2006)

(Mindel et al. 2018). In this model, users surrender the stewardship of their digital identity, data, and content to corporate platform owners, whose fiduciary obligations are to shareholders, not users. Some CSM offer additional monetary rewards, such as TikTok's creator fund or YouTube's Partner Program, compensating popular creators based on video views and engagement or through direct fan donations (Franke et al. 2013). Centralization allows for efficient decision making and user experience optimization through A/B testing and personalized content delivery. However, it also risks monopolistic practices, limited transparency, and cultural insensitivity, as seen in Meta's abrupt policy shifts and X's inconsistent content moderation under Elon Musk (Ciriello et al. 2025c).

In contrast, DSM platforms distribute ownership and control among users through federated open-source protocols and sometimes blockchain-based cryptocurrency tokens (Alizadeh et al. 2023; Ciriello et al. 2024, 2018; Larimer et al. 2017). For instance, Steem assigns voting power proportional to token ownership, while Mastodon allows server administrators to set moderation rules independently, and Bluesky offers algorithm choices from a marketplace. This decentralized approach promotes transparency, inclusivity, and resistance to corporate capture. Yet, DSM struggles with governance inefficiencies, such as low participation in decision making and power imbalances among influential elites. For example, Steem's governance model mirrors Reddit's threaded structure but replicates centralized dynamics (Xie et al. 2021). To attract

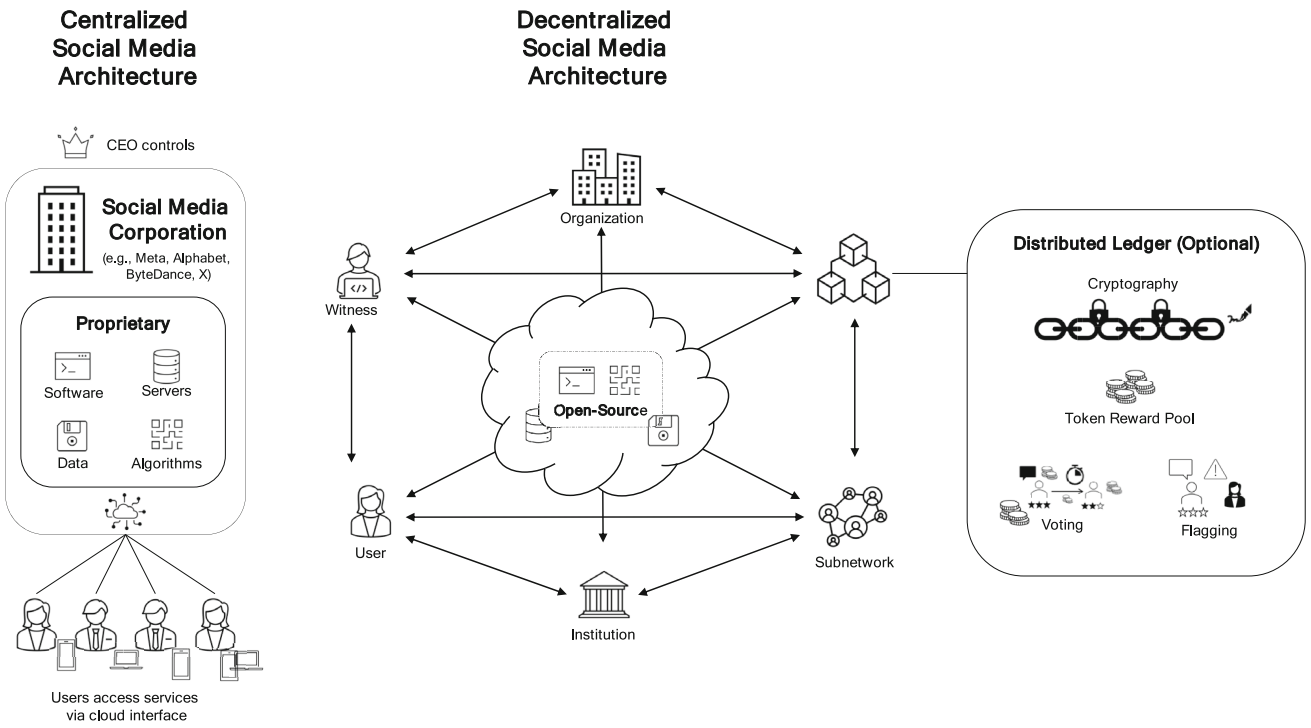

Fig. 1 Architectural models of centralized (left) vs decentralized (right) social media

mainstream adoption, DSM must balance ideological appeals with practical advantages, for instance, by combining open-source protocols with central oversight to mitigate coordination challenges.

Unlike CSM, DSM enables user stewardship, either through direct engagement with platform rules and data governance or by appointing trusted intermediaries, including algorithmic stewards, to act in the user's interest. These stewards are accountable to users rather than corporations. While ownership refers to formal rights over data or assets, and autonomy denotes the absence of external constraint, stewardship foregrounds the responsible and value-aligned management of digital presence (Gregory et al. 2022; Hess and Ostrom 2006). This user-driven form of stewardship reshapes the normative foundation of social media governance. Whereas CSM treats users as a product whose behavior is monetized, DSM has the potential to treat users as principals whose interests are to be safeguarded. This shifts the governance logic from commercial custodianship to participatory stewardship. However, this shift remains precarious, as even DSM can reproduce extractive dynamics if stewardship lacks institutional safeguards.

2.3 Value Appropriation

Value appropriation – how stakeholders derive financial or social benefits – is critical for platform sustainability and requires balancing diverse interests (Beverungen et al. 2015; Mindel et al. 2018). CSM platforms like Facebook capture value of user attention through targeted advertising and data monetization, reinvesting revenue into platform growth and user retention strategies. For example, Facebook fosters community engagement through algorithmic dissemination of content based on user preferences (Kim and Dennis 2019), while TikTok's algorithm promotes content discovery to maximize user satisfaction. However, this model prioritizes shareholder profits over user stewardship, often amplifying harmful content to drive engagement (Horwitz 2021; Riemer and Peter 2021). The monetized value is also highly concentrated. While some CSM platforms share revenue with creators, earnings are skewed toward a small elite. Of YouTube's over 36 million creator channels, only 0.43% of channels capture 68.37% of ad revenue, with 'diamond' creators (10 + million subscribers) earning disproportionately more (US$1.7 million annually on average), while 88% of creators earn virtually nothing (Rieder et al. 2023). This dependency on platform-controlled monetization leaves most creators vulnerable to policy changes and shifting revenue models.

In contrast, DSM platforms enable users to collectively determine value distribution, often incentivizing contributions through cryptocurrency rewards (e.g., Steem) or algorithmic marketplaces (e.g., Bluesky) (Ciriello et al. 2018; Larimer et al. 2017; Thelwall 2017). This can foster greater (perceived) user ownership and engagement but

also introduce risks such as financial volatility, governance inefficiencies, and power concentration among wealthier participants (Ba et al. 2023; Guidi et al. 2021b). Notably, empirical studies find that only between 0.035% (Xie et al. 2021) and 0.2% (Ciriello et al. 2018) of Steem users hold a significant share of the voting tokens, mirroring YouTube's centralization dynamics (Rieder et al. 2023).

Consensus-based value allocation can improve fairness but often slows decision making and complicates long-term sustainability. For instance, Steem's token-based rewards fluctuate with market conditions, creating income instability for creators, while Bluesky's marketplace of algorithms allows users to customize content feeds but raises questions about equitable access. DSM also struggles to replicate CSM's economies of scale, relying on community growth and voluntary contributions rather than corporate-backed marketing. While DSM's participatory models aim to democratize value creation, they face adoption barriers tied to usability, network effects, and the inertia of entrenched CSM (Mindel et al. 2018; Sunyaev et al. 2021).

In this light, eliminating algorithmic content dissemination and ad-based monetization seems impractical. Despite criticisms of filter bubbles (Kitchens et al. 2020), algorithmic curation efficiently manages information overload and personalizes content while ad-based models, despite concerns over data exploitation, sustain platforms and subsidies free access. Subscription or freemium models have been controversial and are not widely adopted, ostensibly to ensure equal access (Jones 2022; Zuckerberg and Fridman 2022). A more viable approach may be to reconfigure these systems – enhancing transparency, accountability, and user control – rather than discarding them entirely.

2.4 Expression Moderation

Expression moderation involves aligning user-generated content with community standards and legal requirements to ensure credibility and mitigate misinformation without unduly infringing on freedom of expression. CSM platforms typically rely on proprietary algorithms and appointed experts for scalable and efficient moderation (Klonick 2018). For example, in response to mounting public pressure, Facebook employed over 35,000 content moderators in 2020 while also relying on group moderation, where community admins enforce rules within specific groups, blending centralized oversight with localized control (U.S. Senate 2020). However, this approach was criticized for overlooking cultural nuances, amplifying bias concerns, and limiting diversity and freedom of expression. Such limitations can erode trust and drive users to less regulated platforms (Bradford et al. 2019; Tyler et al. 2021), as seen with the migration of Donald Trump supporters to Parler and Truth Social. In contrast, platforms like X have introduced hybrid models such as Community Notes, which crowdsource fact checking and moderation while retaining centralized oversight. Despite these innovations, centralized moderation's reliance on proprietary algorithms often leaves accountability gaps, highlighting the need for more transparent and inclusive approaches.

DSM adopts a more inclusive approach, leveraging communities for content verification and moderation. This model promotes transparency and engagement through mechanisms like reputation scores, participatory voting systems, and sometimes token rewards. However, it faces challenges such as polarization, inconsistent enforcement, and power imbalances, reflecting tensions between fostering consensus and resolving disputes (Shaikh and Vaast 2016; Splitter et al. 2023). For example, Steem allows community participation through voting but struggles with equitable value distribution and power dynamics (Ciriello et al. 2018). Similarly, Gab, a DSM platform launched in 2016 with the goal of protecting free speech, has led to a proliferation of extremist, hateful, and conspiracy-driven content due to its minimal moderation policies (Kennedy et al. 2022), illustrating how DSM's emphasis on free speech can enable harmful misinformation. Despite efforts to democratize content validation, disparities between users with varying stakes highlight the complexities of decentralized moderation. Xie et al. (2021) found that in blockchain-enabled communities, a small fraction of users often dominate governance – on Steem, only 0.035% of users controlled over 64% of the voting rights – replicating power imbalances found in centralized platforms. Additionally, consensus-based moderation can struggle to scale, leading to challenges in addressing harmful content.

A key concern for DSM is disinformation, which thrives in loosely regulated environments (Sedlmeir et al. 2023). While blockchain's transparency improves accountability, its immutability and data replication make removing harmful content difficult (Kannengießer et al. 2020). Emerging tools like reputation systems and automated verification can help identify disinformation without undermining user stewardship (Alizadeh et al. 2023; Liu et al. 2022). However, blockchain-based DSM platforms face inherent limitations, such as scalability issues and excessive transparency, which hinder nuanced content moderation (Kannengießer et al. 2020; Sedlmeir et al. 2022; Thibault et al. 2022). Also, blockchain's complexity and reliance on token-based incentives often result in governance inefficiencies and power imbalances, such as low participation and elite capture in decentralized autonomous organizations (DAOs) (Ellinger et al. 2023).

Emerging technologies like verifiable computation and digital wallets could help bridge this trust gap. Verifiable computation enables trustworthy content verification,

ensuring not only that content follows auditable rules but that algorithmic rules, such as those used for post promotion or ad targeting, are not only auditable but demonstrably executed as declared. This mitigates concerns about platforms that open-source their algorithms but later modify them without disclosure. Recent advances in zero-knowledge machine learning demonstrate how such guarantees can be formalized and scaled (Chen et al. 2024). Digital wallets, paired with decentralized identity systems, enhance user control and accountability (Hoess et al. 2024; Jørgensen and Beck 2022; Sunyaev et al. 2021). These tools improve content credibility by verifying provenance and distinguishing bots from humans (Sedlmeir et al. 2023). Critically, they also support democratic governance: by tying voting rights to verified digital identities, they prevent identity-splitting attacks and enable "one human, one vote" principles in DSM. Nevertheless, bot detection remains difficult in open-source contexts, where detection algorithms are vulnerable to adversarial manipulation, triggering an "arms race" dynamic (Ciriello et al. 2025a). To mitigate these risks, combining identity systems, digital wallets, and automated tools may help. For example, federated learning could support decentralized training of moderation algorithms without central oversight while preserving privacy and efficiency (Li et al. 2020).

2.5 Incentive Structures

Incentive structures in social media are critical governance mechanisms, motivating user participation, content creation, and socially desirable behavior. CSM platforms like Facebook and YouTube primarily offer indirect incentives, such as social validation, personal expression, and status building, while enabling creators to monetize attention through ad revenue, brand partnerships, and (to a lesser extent) creator funds (Franke et al. 2013; Thelwall 2017). These systems benefit from centralized management, ensuring consistent payouts and simplified reward mechanisms. However, CSM prioritizes platform profitability, often at the expense of fair creator compensation. Algorithms optimized for engagement tend to favor sensational or polarizing content (Kim and Dennis 2019; Kitchens et al. 2020), concentrating economic benefits among shareholders rather than users, while leading to negative externalities for society such as disinformation. This also creates a "lock-in effect", restricting creators' ability to transfer content, social capital, or revenue streams across incompatible proprietary platforms (Sunyaev et al. 2021; Weiler et al. 2022).

In turn, DSM platforms employ a mix of extrinsic and intrinsic incentive mechanisms to compensate for the lack of centralized management. Blockchain-based platforms like Steem, Hive, and Minds use cryptocurrency payments and revenue-sharing models to reward users (Ciriello et al. 2018; Larimer et al. 2017; Thelwall 2017). These mechanisms enable economic compensation, social graph portability, and reduced platform dependence (Sunyaev et al. 2021). However, extrinsic rewards alone do not drive long-term engagement, as intrinsic motivators, such as community building, social interaction, and reputation, also play a critical role in sustaining participation (Alizadeh et al. 2023).

Features like rate-limited weighted voting and reputation systems aim to distribute influence more equitably between wealthy users and smaller contributors, fostering equity and community ownership (Ciriello et al. 2018). However, wealthy users can still exert disproportionate influence over content curation and governance, replicating power imbalances found in centralized models. Additionally, governance mechanisms like DAO voting often suffer from low participation, while pseudonymity complicates accountability in content moderation and governance (Ellinger et al. 2023). Overemphasizing extrinsic rewards like tokens may also undermine long-term platform viability if engagement becomes purely transactional rather than community driven (Chen et al. 2023; Thelwall 2017).

Simpler DSM platforms, such as Mastodon, rely on open-source protocols and voluntary participation without relying on blockchain. While this approach avoids the complexities of token economies, the absence of direct financial rewards may limit content production and user retention (Alizadeh et al. 2023; Gehl and Zulli 2022). Hybrid models like Bluesky blend decentralized protocols (e.g., the AT Protocol) with centralized oversight, offering features like algorithmic marketplaces and user-driven moderation. These aim to balance transparency and user stewardship with the scalability and efficiency of centralized systems. However, Bluesky's corporate ownership reinforces the tension between decentralized and centralized control, as decision-making authority remains within a corporation despite its federated open-source protocol.

Financial sustainability remains an existential challenge for DSM. Mastodon relies on donations and community funding, while Steem's token-based reward systems are volatile and often inequitable. Bluesky's "marketplace of algorithms" introduces a novel monetization model, allowing users to engage with personalized feeds, but its long-term viability remains uncertain. The volatility of token economies and reliance on community funding underscore the need for more diverse and stable revenue streams to ensure DSM longevity. Nonetheless, DSM could simplify crowdfunding by removing intermediaries (Conboy et al. 2020; Delkhosh et al. 2023).

2.6 Coordination

Coordination in social media involves managing dependencies between activities to achieve collective goals, such as platform operations, user rights administration, and decision making around value appropriation and content moderation (Malone and Crowston 1994). CSM platforms like Facebook and YouTube rely on hierarchical (top-down) coordination, enabling scalability, policy consistency, and streamlined resource allocation (Klonick 2018). However, this model concentrates power, reducing transparency and increasing risks of monopolization, censorship, and cultural insensitivity (Klonick 2018; Seetharaman et al. 2021). Concentrated decision making can also foster user distrust and neglect cultural nuances (Tyler et al. 2021).

In contrast, DSM platforms rely on distributed (bottom-up) coordination through voluntary task assignment, federated networks, or blockchain-based mechanisms (Beck et al. 2018; Crowston et al. 2005). For example, Steem records governance decisions on-chain, with elected "witnesses" validating transactions (Ciriello et al. 2018). While DSM promotes transparency and inclusivity, it faces significant challenges in coordinating activities at scale. As platforms grow, consensus building and decision making often become slower and more complex, leading to inefficiencies in governance. For instance, voluntary task assignment can result in delays and power imbalances, as influential elites may dominate decision making, undermining the egalitarian intent of decentralization.

In addition, balancing corporate control and participatory governance remains a challenge. Privacy is a key concern in DSM: While decentralization limits corporate data collection, blockchain's data replication and transparency can conflict with regulatory requirements, such as the right to erasure under the European General Data Protection Regulation (GDPR) (Kannengießer et al. 2020). Federated and hybrid models (e.g., Mastodon, Bluesky) mitigate these risks through local data storage, avoiding immutable public ledgers. Zero-knowledge proofs (ZKPs) offer a promising cryptographic solution by enabling selective verification without disclosing underlying data. ZKPs can facilitate decentralized identity verification (such as proof of personhood or age) while preserving pseudonymity, which is especially relevant under policies like Australia's 2024 law restricting social media access for users under 16. ZKPs also support self-sovereign identity (SSI) systems, empowering users to manage cross-platform credentials and portable social graphs without relying on centralized authorities (Sedlmeir et al. 2022). These tools mitigate Sybil attacks, prevent vote manipulation, and reduce reliance on custodians. However, ZKPs are still computationally demanding and technically complex (Chanson et al. 2019; Renwick and Gleasure 2021). Non-blockchain DSM avoids immutability issues but shifts data management responsibility to users, requiring better tools for privacy, security, and backup. Off-chain storage systems like the InterPlanetary File System (IPFS) address this challenge by hosting large content (e.g., video) externally, while only recording metadata and transactions on-chain, thereby reducing computational overhead (Lage et al. 2022).

3 A DSM Research Agenda for the BISE Community

The emergence of DSM represents an alternative approach to the governance of social media. This provides research opportunities for the BISE community, including a re-evaluation of prevailing governance approaches to examine their adaptation to the unique challenges and opportunities presented by DSM platforms. As the BISE community is adept at exploring these issues, it stands to contribute significantly to the theoretical and practical understanding of social media governance, particularly in the context of emerging decentralized models. Although DSM presents an innovative progression in social media governance, this evolution is fraught with technical, ethical, and sustainability challenges. To address these complexities, we outline three key areas for future DSM research: (1) Strategy, Governance, and Regulation, (2) Leadership, Management, and Operations, and (3) Engineering, Development, and Analytics. These areas encapsulate DSM's structural, operational, and technological aspects, guiding the BISE community toward impactful research contributions.

3.1 DSM Strategy, Governance, and Regulation

Governance shapes decision-making processes, policy enforcement, and incentive mechanisms (Beck et al. 2018). Unlike CSM, where corporations set platform rules, DSM aims to distribute decision power among users through mechanisms such as rate-limited weighted voting, reputation scores, and token-based incentives (Alizadeh et al. 2023; Guidi et al. 2021b). However, these mechanisms remain experimental and face persistent challenges related to power imbalances and regulatory compliance.

A key governance concern is the concentration of influence among a small group of users. Despite aspirations for democratized control, inequality persists (Xie et al. 2021). Wealthy token holders can dominate governance and moderation processes, risking elite capture and replicating centralized dynamics within ostensibly decentralized systems. Rate-limited weighted voting has been proposed to reduce such risks (Guidi et al. 2021b), but its efficacy is unproven. While some concentration may

support clearer accountability and faster decision making, it risks undermining the democratic ethos of DSM. This raises a critical research question (RQ):

> **RQ1**: *How can DSM balance democratic control with governance efficiency while maintaining power equilibrium?*

Another central challenge is designing inclusive and transparent moderation systems that balance freedom of expression with the mitigation of harm and disinformation. Moderation in DSM is inherently sociotechnical: neither purely algorithmic nor purely human. CSM platforms rely on algorithmic filtering and professional moderation, raising concerns about opacity, bias, and censorship (Klonick 2018; Tyler et al. 2021). In contrast, DSM platforms emphasize community-led moderation, rewarding users for validating content, yet these processes are often slow, inconsistent, and susceptible to manipulation. Blockchain-based transparency can enhance accountability but complicates content removal due to its immutability, raising compliance challenges under privacy laws like the European General Data Protection Regulation (GDPR), which enshrine user control over personal data (Chanson et al. 2019; Renwick and Gleasure 2021). Moreover, DSM's federated architecture complicates identity verification, further blurring lines of legal responsibility, especially in the context of misinformation or illicit content. Thus, we ask.

> **RQ2**: *How can DSM platforms meet regulatory obligations for privacy and accountability without undermining decentralization and immutability?*

DSM governance must also align with broader digital strategy frameworks, including incentive design, economic models, and hybrid coordination approaches. In contrast to CSM's focus on profitability and engagement optimization, DSM platforms depend on algorithmic coordination, community decision making, and token-based incentives (Ciriello et al. 2024, 2018; Ciriello 2021; Gregory et al. 2022), all of which remain insufficiently understood in terms of their long-term strategic consequences.

Financial sustainability poses a persistent challenge. While token-based incentives can attract initial engagement, they often lead to speculative behavior, transactional participation, and concentration of wealth (Alizadeh et al. 2023; Chen et al. 2023; Liu et al. 2022; Sunyaev et al. 2021; Thelwall 2017). Non-tokenized models, such as Mastodon, depend on voluntary contributions and are vulnerable to funding gaps and inconsistent user retention (Gehl and Zulli 2022). Hybrid models, such as Bluesky, aim to combine federated protocols with crowdfunding or commercial support, but corporate involvement can undermine user stewardship. This fragmented ecosystem calls for integrative frameworks that combine decentralized governance with sustainable business models, supported by algorithmic coordination, smart contract enforcement, and consensus mechanisms to avoid governance capture (MacLean and Titah 2023). This leads to a further research challenge:

> **RQ3**: *How can DSM governance models support strategic stability and financial sustainability while maintaining equitable participation?*

External regulation will also shape DSM's development. CSM operates within developed legal regimes, subject to commercial law, consumer protection, shareholder oversight, and national rules on privacy, content, and competition. Agencies such as the European Commission and the U.S. Federal Trade Commission (FTC) enforce compliance through fines, mandates, and investigations. DSM, by contrast, often lacks a defined legal entity, operating in a grey zone (Zetzsche et al. 2018, 2019). DAOs, token-based systems, and federated models complicate enforcement mechanisms, as no clear entity may be held accountable (Sedlmeir et al. 2023). Furthermore, decentralized identifiers, reputation systems, and automated moderation raise concerns about procedural fairness and liability allocation (Dolata et al. 2022).

An unresolved question is how to coordinate DSM platforms under a global regulatory framework without compromising their decentralized ethos. One possible approach is to establish a dedicated institution for DSM governance, drawing inspiration from other institutions such as ICANN (for internet governance), the Basel Committee (for financial oversight), or SWIFT (for international banking coordination). Such an institution could coordinate cross-border compliance, harmonize standards, and facilitate dispute resolution while preserving DSM's user stewardship – provided it secures legitimacy among governments, platform operators, and user communities. Hence:

> **RQ4:** *How can global regulatory institutions enforce compliance in DSM while preserving decentralization in the absence of a clearly accountable legal entity?*

Overall, DSM introduces a novel and still-evolving paradigm for platform governance. Future research should address its structural asymmetries, legal ambiguities, and strategic vulnerabilities. BISE scholars are well-positioned to contribute frameworks that mitigate power concentration, support scalable and transparent moderation, and reconcile decentralized governance with institutional oversight, ensuring that DSM remains a sustainable and socially responsible alternative to CSM.

3.2 DSM Leadership, Management, and Operations

DSM introduces a decentralized approach to leadership, management, and operations, diverging from the hierarchical structures and ad-driven revenue models of CSM. While this shift fosters participatory innovation, it also raises challenges in financial sustainability, business process management (BPM), and leadership dynamics. Research is needed to explore viable revenue models, decentralized BPM approaches, and leadership strategies tailored to DSM environments.

Leadership in DSM typically emerges organically from community members rather than being assigned through formal roles (Guidi 2020). Strategic decisions may be proposed, debated, and executed collectively (Mindel et al. 2018), blurring the lines between leadership and participation. While this model promotes inclusivity and transparency, it often creates ambiguity around responsibility, vision-setting, and long-term strategy. From an operational perspective, DSM faces the challenge of sustaining a sociotechnical system without centralized oversight. Infrastructure maintenance, community moderation, and protocol development are often handled by informally coordinated contributors, raising concerns about quality assurance and continuity (Ciriello et al. 2024; Mindel et al. 2018). On Mastodon, for example, server administrators enforce their own rules (Gehl and Zulli 2022), which may conflict with broader platform values or legal obligations (e.g., hate speech moderation), leading to operational fragmentation.

Participation in governance, especially within DAOs, tends to be low and disproportionately driven by a small, highly engaged subset of users. This often results in decision making dominated by wealthier stakeholders (Ellinger et al. 2023; Larimer et al. 2017), raising concerns about oligarchic control, governance stagnation, and early-adopter advantage. A central research question is:

> **RQ5**: *How does leadership emerge and function within DSM, and what mechanisms support strategic direction and operational coherence in the absence of formal hierarchies?*

DSM also challenges traditional assumptions in BPM, which relies on centralized workflows, predefined roles, and formal accountability (Beverungen et al. 2021; Mendling et al. 2018). In contexts that require agility, peer-to-peer coordination, and federated decision making, DSM may inspire new approaches to process design and shape decentralized content production, moderation, and user-driven task orchestration. These DSM characteristics differ from DAOs' more formalized rule-based business governance (Ellinger et al. 2023; Saurabh et al. 2025).

While traditional BPM ensures compliance through automation, role-based access, and audit trails (Jovanovic et al. 2022), DSM relies on voluntary contributions and token incentives, often resulting in inconsistent enforcement and regulatory ambiguity. These issues are particularly acute in regulated sectors such as finance, healthcare, or logistics, where clearly defined, auditable processes are essential (Mendling et al. 2018). Blockchain-based enforcement via smart contracts offers some potential (Gregory et al. 2022), but rigidity in rule execution can hinder adaptability (Kannengießer et al. 2020). Moreover, DSM does not directly address inter-organizational BPM needs such as supply chain coordination, where blockchain initiatives like TradeLens have faced adoption hurdles (Jovanovic et al. 2022).

Nevertheless, DSM governance principles could enhance BPM in contexts requiring flexibility, stewardship, and decentralized coordination. Future research should explore how DSM logics can inform BPM design in dynamic environments (Mendling et al. 2018; vom Brocke and Rosemann 2015). A key research question is:

> **RQ6**: *How can principles of decentralized coordination in DSM inform the design of business processes in contexts requiring flexibility, stewardship, and user-driven participation?*

Unlike CSM, where executives define strategy, DSM leadership is distributed and shaped by algorithmic incentives. As enterprise social media evolved from CSM (van Osch and Bulgurcu 2020), DSM may catalyze new organizational models, including DAOs (Ellinger et al. 2023). Research is needed to examine how DSM influences digital transformation in traditional firms and structures "born-digital" organizations. Leadership in DSM ecosystems is likely to emerge from community engagement, reputation mechanisms, and token-based governance, but this structure remains volatile and open to manipulation.

DSM also has the potential to reshape digital labor markets, fostering decentralized decision making (Katz 1993; Lotti et al. 2023), reconfiguring social hierarchies (Riemer et al. 2015), and introducing alternative worker remuneration (Bello and Daniel 2022). Tokenized reward systems can redefine creative labor, influencer economies, and gig work, offering new career opportunities but also significant financial volatility (Dabiran et al. 2024; Delkhosh et al. 2023). Unlike traditional influencers who rely on sponsorships, DSM creators often depend on token income subject to market fluctuations, governance shifts, and engagement metrics. This volatility threatens career stability and raises concerns about the sustainability of digital labor in DSM. A core question is:

RQ7: *How can DSM balance financial sustainability with community-driven content creation and equitable creator rewards?*

Overall, DSM signals a departure from traditional models of leadership, business processes, and digital labor but faces structural challenges in sustainability, coordination, and governance. Addressing these issues will require interdisciplinary research across economics, BPM, engineering, and IS. Developing hybrid monetization models, scalable process designs, and stable leadership structures will be key to making DSM a viable alternative to CSM. The BISE community can contribute by quantifying DSM participation patterns, conducting field experiments on token incentives, assessing effects on content quality and productivity, and comparing open-source versus proprietary models. Such work is vital for understanding the broader economic and organizational implications of user stewardship.

3.3 DSM Engineering, Development, and Analytics

DSM's technical foundations remain underdeveloped, offering both opportunities and risks. Unlike CSM, which relies on advanced centralized infrastructures, DSM operates on evolving architectures, user-governed protocols, and cryptographic trust mechanisms. While this enhances privacy, user stewardship, and resistance to platform capture, it also introduces challenges in scalability, interoperability, and sustainability. A focused research agenda is needed to explore how DSM can complement and reconfigure digital ecosystems.

Scalability remains one of DSM's most pressing technical challenges. Whereas CSM leverages centralized cloud infrastructure for high-speed, low-cost data processing, DSM's blockchain-based and federated models introduce latency, redundancy, and transaction costs (Kannengießer et al. 2020; Sedlmeir et al. 2022; Thibault et al. 2022). Data replication across multiple nodes reduces efficiency compared to single-instance hosting. While Layer-2 solutions such as state channels and rollups show promise, they remain largely experimental. Hybrid architectures that combine off-chain storage, cryptographic commitments, and distributed caching may enhance performance without undermining decentralization (Lage et al. 2022). DSM platforms are highly interactive and user-driven, necessitating scalability not only in transaction throughput but also in moderation, identity management, and content discovery. The core question remains:

RQ8: *How can DSM scale without compromising data sovereignty?*

Importantly, DSM should be understood as a sociotechnical system: an infrastructure for public, interactive, and increasingly AI-mediated coordination. Algorithmic content moderation presents distinct challenges. CSM employs centralized AI filtering and proprietary algorithms, which are efficient but opaque and susceptible to bias (Tyler et al. 2021). DSM relies on community-driven moderation, token-based voting, and federated rule enforcement, which can be inconsistent, slow, and prone to manipulation such as "vote farming" (Ciriello et al. 2018; Xie et al. 2021). Centralized AI tools, especially software-as-a-service (SaaS) application programming interfaces (APIs) (Feuerriegel et al. 2024), often conflict with DSM's commitment to data sovereignty. Privacy-preserving techniques such as federated learning and differential privacy offer alternatives, though their efficacy in decentralized contexts remains unclear (Jørgensen and Beck 2022). Open-source large language models (LLMs) like DeepSeek's V3 and Meta's LLaMA offer new opportunities but can be exploited by malicious actors (Ciriello et al. 2025a). Therefore, a pressing research question is:

RQ9: *How can DSM integrate distributed content moderation without undermining stewardship, privacy, or transparency?*

Interoperability between DSM and CSM is a critical concern. Most organizations are unlikely to transition fully to DSM in the short term but may selectively adopt decentralized components, such as blockchain-based identity systems or federated networks, within existing ecosystems. Early adopters may include universities, civic tech platforms, and content creators who rely on CSM for scale and monetization but wish to experiment with decentralized models. CSM platforms themselves are incorporating DSM-like features (e.g., Reddit Coins), suggesting hybrid configurations are likely to prevail. Understanding this intersection is vital for the BISE community. While tools like self-sovereign identity (SSI), verifiable credentials, and blockchain-based authentication can support cross-platform identity management (Dietz and Pernul 2020; French et al. 2021), legal frameworks such as the GDPR and the Digital Markets Act (DMA) impose constraints on data portability and compliance. Developing standards that allow DSM to function within multi-platform environments – without being co-opted – is a pressing challenge. Thus, we ask:

RQ10: *How can sociotechnical governance frameworks ensure legally compliant interoperability between DSM and existing CSM ecosystems?*

Beyond scalability, DSM must address its economic and environmental sustainability. Many platforms rely on token-based incentives, decentralized revenue-sharing, and

Table 3 Sample research questions for future BISE research on DSM

Area	Sample Research Questions
DSM Strategy, Governance, and Regulation	RQ1: How can DSM balance democratic control with governance efficiency while maintaining power equilibrium?
	RQ2: How can DSM platforms meet regulatory obligations for privacy and accountability without undermining decentralization and immutability?
	RQ3: How can DSM governance models support strategic stability and financial sustainability while maintaining equitable participation?
	RQ4: How can global regulatory institutions enforce compliance in DSM while preserving decentralization in the absence of a clearly accountable legal entity?
DSM Leadership, Management, and Operations	RQ5: How does leadership emerge and function within DSM, and what mechanisms support strategic direction and operational coherence in the absence of formal hierarchies?
	RQ6: How can principles of decentralized coordination in DSM inform the design of business processes in contexts requiring flexibility, stewardship, and user-driven participation?
	RQ7: How can DSM balance financial sustainability with community-driven content creation and equitable creator rewards?
DSM Engineering, Development, and Analytics	RQ8: How can DSM scale without compromising data sovereignty?
	RQ9: How can DSM integrate distributed content moderation without undermining stewardship, privacy, or transparency?
	RQ10: How can sociotechnical governance frameworks ensure legally compliant interoperability between DSM and existing CSM ecosystems?
	RQ11: How can DSM adopt energy-efficient architectures and economic models without introducing speculative risk or excessive resource consumption?
	RQ12: How can DSM integrate distributed AI-driven personalization and open-source incentive structures while ensuring scalability, transparency, and equitable value distribution?

crowdfunding (Mindel et al. 2018; Liu et al. 2022). These models are vulnerable to volatility, speculation, and wealth concentration. Additionally, blockchain-based DSM models can be energy-intensive, particularly those using proof-of-work (PoW) protocols (Beck et al. 2022). Alternatives such as proof-of-stake (PoS), proof-of-reputation (PoR), proof-of-contribution (PoC), and sharded architectures offer improved energy efficiency. Ethereum, for instance, has demonstrated PoS feasibility, but broader adoption still requires safeguards around governance transparency, equitable token distribution, and verifiable content rules (Schoormann et al. 2023). Hybrid economic models that combine tokenized incentives with ethical advertising and crowdfunding mechanisms could offer more resilient alternatives. Research is needed to explore how DSM can balance decentralization, energy efficiency, and financial sustainability. Thus:

> **RQ11**: *How can DSM adopt energy-efficient architectures and economic models without introducing speculative risk or excessive resource consumption?*

Usability remains a significant barrier to DSM adoption. Decentralized governance structures and complex technical interfaces create steep learning curves (Brenner et al. 2014). Off-chain storage systems like IPFS reduce blockchain load but introduce coordination challenges around data consistency and reliability. Most users lack the technical proficiency or willingness to manage encryption keys, configure federated identities, or navigate on-chain voting (Ciriello et al. 2024, 2018). Generative AI may improve usability and accessibility (Feuerriegel et al. 2024; French et al. 2021), but reliance on centralized AI services (e.g., OpenAI, AWS) conflicts with DSM's decentralization ethos (Kannengießer et al. 2020).

Scalability in DSM is not solely a technical concern. It also involves scaling the social infrastructure (governance, moderation, and usability) across interoperable platforms. Hybrid solutions using off-chain AI processing and downloadable open-source models can address these issues, trading some accuracy for transparency and user stewardship. Blockchain-based verification of AI-generated content ensures traceability, while offline models enable watermarking and provenance validation, enhancing authenticity and accountability. The intersection of DSM and LLMs in personalized media and marketing offers fertile ground for research, particularly in recommender systems and content personalization (Feuerriegel et al. 2024; Matz et al. 2017). However, more work is needed to safeguard user stewardship.

Key research priorities for DSM include privacy-centered platform architecture, user-friendly governance design, conceptual modelling for content management, and effective data protection strategies. Aligning DSM technology with principles of privacy, user sovereignty, and democratic governance requires technical and social innovations. DSM also presents opportunities for sustainable platform design. These include energy-efficient infrastructures (Beck et al. 2022; Schoormann et al. 2023) and multi-stakeholder approaches that reflect diverse perspectives (Maedche et al. 2016). Novel incentive structures, such as cryptocurrency rewards and reputation-based scoring, could reshape open-source software communities like GitHub by providing tangible rewards for contributions (Catalini and Gans 2020). By linking participation to financial incentives and social capital, DSM platforms could catalyze innovation and support the sustainability of open-source ecosystems. Thus, we ask:

> **RQ12**: *How can DSM integrate distributed AI-driven personalization and open-source incentive structures while ensuring scalability, transparency, and equitable value distribution?*

Overall, DSM represents a gradual shift toward decentralization rather than a radical break with CSM. Its future hinges on overcoming key sociotechnical challenges. This research agenda highlights critical issues in DSM's development, requiring interdisciplinary collaboration across computer science, economics, and information systems. While DSM's potential remains uncertain, addressing these challenges helps to ensure that decentralized models remain viable, scalable, and sustainable alternatives in the digital economy (Table 3).

4 Conclusion

This Catchword article critically discusses DSM as an emerging alternative to CSM's dominant governance model. Rather than a binary shift, social media governance operates on a spectrum, enabling hybrid models that combine decentralization with centralized elements. While DSM enhances user stewardship and transparency, adoption remains constrained by governance inefficiencies, financial instability, and usability challenges. Federated architectures and blockchain-based governance introduce novel mechanisms but also pose risks such as financial speculation, power concentration, and regulatory uncertainty. In contrast, CSM platforms offer scalability and efficiency, facilitating rapid decision making and optimized user experiences, yet their centralized control fosters monopolistic practices, opacity, and cultural insensitivity.

This paper evaluates the trade-offs between DSM and CSM governance models, presenting foundational research questions for the BISE community. Key areas for inquiry include sustainable monetization models, governance frameworks, content moderation, and system scalability. Future research should examine whether DSM can expand beyond niche adoption, how decentralized incentives shape platform economics, and how governance models can balance user stewardship with effective decision-making. Rather than a definitive transition, DSM represents an ongoing experiment in platform governance that requires rigorous, interdisciplinary investigation into its long-term feasibility and societal impact.

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