
Data Monetization as a New Economic Asset in the Digital Economy Ecosystem

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ABSTRACT

The rapid development of the digital economy has transformed data from a by-product of digital activities into a strategic economic asset that can be monetized and utilized to create new sources of value. This study aims to analyze data monetization as a new economic asset within the digital economy ecosystem by examining its value creation mechanisms, monetization pathways, and governance challenges. This research employs a qualitative approach with a descriptive-analytical design based on a systematic literature review of scholarly articles published between 2020 and 2025. Data were collected through documentation techniques from reputable journals and analyzed using qualitative content analysis, thematic categorization, and conceptual synthesis. The findings reveal that data generates economic value through three main pathways: operational efficiency, direct data commercialization, and data-driven services. Advanced technologies such as artificial intelligence, big data analytics, and IoT play a crucial role in enabling these processes. However, the study also identifies significant challenges, including unequal value distribution, platform dominance, and concerns related to data privacy and governance. The discussion highlights the need for inclusive and transparent frameworks to ensure fair participation in the data economy. In conclusion, data monetization represents a transformative force in the digital economy, requiring integrated strategies that combine technological innovation with ethical governance to achieve sustainable and equitable economic outcomes.

Keywords: Data Monetization, Digital Economy, Economic Asset, Data Governance, Big Data

INTRODUCTION

The rapid expansion of the digital economy has fundamentally transformed the role of data from a mere by-product of digital activities into a strategic economic asset with significant value creation potential. In contemporary economic systems, data is increasingly recognized as a core resource that can be monetized, traded, and leveraged to develop innovative business models across various sectors. This transformation reflects a paradigm shift in which data is no longer treated solely as information but as a form of capital that drives productivity, competitiveness, and economic growth. The growing dominance of digital platforms and technology-driven firms further reinforces this shift, as their market valuation is often closely linked to their ability to collect, process, and monetize large volumes of user data. In this context, data monetization has emerged as a central mechanism within the digital economy ecosystem, reshaping traditional economic structures and redefining the sources of value creation (Birch et al., 2021).

A key phenomenon underlying this transformation is the reclassification of personal and behavioral data as a new class of economic assets. Unlike traditional assets, data possesses unique characteristics such as non-rivalry, scalability, and reusability, which enable it to generate continuous value over time. Major technology companies have capitalized on these characteristics by developing business models that rely heavily on user data, engagement metrics, and predictive analytics to forecast future revenue streams. As noted by Hackfort et al. (2024), the commodification of user data extends beyond the data itself to include user-related metrics such as activity levels and interaction patterns, which serve as proxies for long-term profitability. Similarly, Gawer (2021) emphasizes that digital platforms operate as ecosystems where data acts as the central coordinating resource, enabling firms to orchestrate value creation across multiple stakeholders. This phenomenon highlights the strategic importance of data in shaping competitive advantage and market dominance in the digital economy.

The conceptualization of data as the “oil of the digital economy” further illustrates its critical role in driving economic value. However, similar to crude oil, raw data only becomes valuable when it is systematically collected, processed, and analyzed. The integration of advanced technologies such as artificial intelligence (AI), big data analytics, and the Internet of Things (IoT) has significantly enhanced the capacity to extract meaningful insights from data, thereby increasing its economic value. Butaboev et al. (2025) argue that the effective utilization of big data can significantly improve productivity and efficiency across sectors, contributing to national economic growth. This perspective is supported by Virani (2023), who highlights that data-driven decision-making has become a key determinant of organizational performance in the digital era. At the national level, initiatives such as “Digital Uzbekistan 2030” demonstrate how governments are actively incorporating data strategies into their development agendas, positioning data as a critical driver of economic transformation and competitiveness (Butaboev et al., 2025).

Within the digital economy ecosystem, data monetization occurs through multiple pathways, reflecting the diverse ways in which data can be transformed into economic value. One primary pathway involves the use of data to enhance products and operational efficiency through internal analytics, AI, and IoT applications. This approach enables organizations to optimize processes, reduce costs, and improve service delivery, thereby generating indirect economic benefits. Another pathway involves the direct commercialization of data through mechanisms such as data marketplaces, data brokerage, and data trading platforms, including emerging models such as non-fungible token (NFT)-based datasets. Studies by Jnr (2023) and Zhang et al. (2023) highlight the growing importance of data marketplaces as platforms for exchanging data assets, while Sánchez et al. (2024) and Wang and Song (2024) emphasize the role of decentralized technologies in facilitating secure and transparent data transactions. A third pathway involves the provision of data-driven services, such as targeted advertising, insights-as-a-service, and platform-based monetization models, which enable firms to generate revenue by leveraging user data. These diverse monetization pathways underscore the multifaceted nature of data as an economic asset and its central role in the digital economy (Firouzi et al., 2022).

Despite these opportunities, the increasing monetization of data has also given rise to significant challenges and concerns, particularly in relation to governance, ethics, and market competition. One of the most pressing issues is the asymmetry in data ownership and value distribution, where large digital corporations are able to extract substantial economic value from data, while individuals and smaller entities receive limited or no compensation. Birch et al. (2021) argue that this imbalance reflects the

emergence of a new form of economic inequality, often referred to as “data capitalism,” in which control over data translates into economic power. Similarly, Koskinen et al. (2023) highlight the structural inequalities embedded in data markets, where access to data and analytical capabilities is concentrated among a few dominant players. This situation raises critical questions about fairness, inclusivity, and the equitable distribution of value within the digital economy.

In addition to economic inequality, the monetization of data also raises important ethical and regulatory concerns, particularly regarding data privacy, ownership rights, and surveillance. The concept of “surveillance capitalism,” as discussed by Hackfort et al. (2024), underscores the extent to which personal data is commodified and exploited for commercial purposes, often without explicit consent or adequate compensation. Furthermore, the phenomenon of “data colonialism” highlights the global dimension of data exploitation, where data generated in one region is extracted and monetized by entities in another, often leading to imbalanced economic benefits (Birch et al., 2021). These challenges necessitate the development of robust data governance frameworks that can balance economic innovation with ethical considerations and individual rights.

To address these issues, various governance models and regulatory frameworks have been proposed, emphasizing the importance of data sovereignty, interoperability, and trust within the data economy. The concept of data spaces and data exchange ecosystems, as discussed by Otto (2022) and Hayashi et al. (2021), provides a framework for enabling secure and collaborative data sharing while maintaining control over data assets. These models prioritize transparency, accountability, and equitable value distribution, thereby supporting the development of a more inclusive data economy. Additionally, regulatory initiatives such as the General Data Protection Regulation (GDPR) aim to protect individual privacy and establish clear guidelines for data usage, although their effectiveness in addressing the complexities of data monetization remains a subject of ongoing debate (Liu, 2020).

From a research perspective, although the literature on data monetization has expanded significantly in recent years, several gaps remain. First, many studies focus on specific aspects of data monetization, such as technological infrastructure or regulatory frameworks, without providing a comprehensive analysis of how data functions as an integrated economic asset within the broader digital ecosystem. Second, there is limited research on the mechanisms through which value is created and distributed across different stakeholders, particularly in decentralized and cross-sectoral contexts. Third, existing studies often overlook the dynamic and evolving nature of data monetization, particularly in relation to emerging technologies such as blockchain, AI, and edge computing. These gaps highlight the need for a more holistic and integrative approach to understanding data monetization as a complex and multidimensional phenomenon (Ding et al., 2025).

In response to these gaps, this study offers a novel contribution by developing a comprehensive conceptual framework that integrates the economic, technological, and governance dimensions of data monetization. Unlike previous studies that examine these aspects in isolation, this research emphasizes the interconnectedness of data as an economic asset, the mechanisms of its monetization, and the institutional structures that shape its value creation and distribution. Furthermore, this study highlights the role of emerging technologies in enabling new forms of data monetization, particularly through decentralized platforms and secure data exchange systems. By incorporating recent developments and interdisciplinary perspectives, this research provides a more nuanced understanding of the evolving data economy.

Therefore, the primary objective of this study is to analyze data monetization as a new economic asset within the digital economy ecosystem by examining its value creation mechanisms, monetization pathways, and governance challenges in an integrated framework. This objective is expected to contribute to the development of more inclusive, sustainable, and ethically grounded data economy models that can maximize the benefits of data while minimizing its associated risks.

METHODS

This study employs a qualitative research approach with a descriptive-analytical design to examine data monetization as a new economic asset within the digital economy ecosystem. The research focuses on understanding the mechanisms of value creation, monetization pathways, and governance challenges associated with data utilization across various sectors. The study adopts a literature-based methodology, where data are collected from secondary sources, including peer-reviewed journal articles, policy reports, and publications from international organizations and digital economy institutions. The data collection technique is conducted through a systematic literature review, emphasizing recent and relevant studies published between 2020 and 2025 to capture the latest developments in data monetization, big data, artificial intelligence, and digital platforms. The selection of sources is carried out using purposive sampling criteria, ensuring that the literature included is credible, up-to-date, and directly aligned with the research objectives, particularly those addressing data as an economic asset, data marketplaces, and data governance frameworks.

The data analysis technique utilizes qualitative content analysis combined with a thematic and comparative approach. The analysis process involves several stages, including data reduction, coding, categorization, and interpretation to identify key themes and patterns related to data monetization and its economic implications. Furthermore, this study applies a conceptual synthesis method to integrate findings from diverse literature into a unified analytical framework, highlighting the relationships between data value creation, monetization models, and governance structures. To strengthen the validity and reliability of the findings, source triangulation is employed by comparing insights across different studies, sectors, and geographical contexts. This approach enables a comprehensive understanding of how data functions as a strategic economic asset and provides in-depth insights into the opportunities and challenges of monetizing data within the evolving digital economy ecosystem.

RESULTS AND DISCUSSION

The following presents the results of the qualitative analysis derived from the systematic literature review on data monetization as a new economic asset within the digital economy ecosystem. The table synthesizes key findings related to value creation mechanisms, monetization pathways, ecosystem structures, and governance challenges identified across various studies.

Table 1. Synthesis of Data Monetization as an Economic Asset in the Digital Economy Ecosystem

No	Key Dimension	Description of Findings	Monetization Mechanism	Implication for Economic Value	Key References
1	Data as Economic Asset	Data transformed from by-product	User data, behavioral data,	Drives firm valuation and long-term	Birch et al. (2021); Hackfort et

		into strategic, tradable, and scalable asset	engagement metrics	revenue potential	al. (2024); Gawer (2021)
2	Value Creation Process	Data gains value through collection, processing, and analytics (AI, Big Data)	Data analytics, AI, IoT	Enhances productivity and operational efficiency	Butaboev et al. (2025); Virani (2023); Firouzi et al. (2022)
3	Direct Data Monetization	Data traded or licensed through digital platforms and marketplaces	Data marketplace, data brokers, NFT datasets	Creates new revenue streams and digital asset markets	Jnr (2023); Zhang et al. (2023); Sánchez et al. (2024); Wang & Song (2024)
4	Indirect Monetization	Data used to support services and platform-based business models	Targeted ads, insights-as-a-service, platform fees	Expands digital service economy and business scalability	Birch et al. (2021); Hackfort et al. (2024); Firouzi et al. (2022)
5	Digital Ecosystem Structure	Data economy structured in platform ecosystems and data exchange networks	Data spaces, interoperability systems	Enables collaboration but risks centralization	Otto (2022); Hayashi et al. (2021); Gawer (2021)
6	Decentralized Data Economy	Emerging blockchain-based data marketplaces and IoT-driven data exchange	Smart contracts, DLT, tokenized data	Enhances transparency, trust, and user participation	Jnr (2023); Sánchez et al. (2024); Wang & Song (2024)
7	Governance and Ethics	Issues of privacy, ownership, and unequal value distribution	GDPR, data sovereignty, ethical frameworks	Requires regulation to ensure fairness and protection	Liu (2020); Koskinen et al. (2023); Ding et al. (2025)
8	Market Inequality	Dominance of Big Tech and asymmetrical value extraction	Platform control, data monopolization	Increases economic inequality and dependency	Birch et al. (2021); Koskinen et al. (2023)

Based on Table 1, it can be interpreted that data monetization within the digital economy ecosystem is a multidimensional process involving the transformation of data into a strategic economic asset through various value creation and monetization mechanisms. The findings highlight that data derives its economic value not inherently,

but through systematic processes such as data collection, processing, and advanced analytics, which are enabled by emerging technologies like artificial intelligence and the Internet of Things. Furthermore, the study identifies both direct and indirect monetization pathways, indicating that data can generate value either as a tradable commodity in digital marketplaces or as a supporting resource for service-based and platform-driven business models.

However, the analysis also reveals significant structural and governance challenges within the data economy. The dominance of large digital platforms creates asymmetrical value distribution, where a small number of actors capture a disproportionate share of economic benefits, while data producers—such as individuals and smaller firms—often receive limited returns. Additionally, issues related to data privacy, ownership, and ethical use remain critical concerns, necessitating the development of robust governance frameworks and regulatory mechanisms. The emergence of decentralized technologies, such as blockchain-based data marketplaces, offers potential solutions by enhancing transparency, trust, and user participation, although their implementation remains in an early stage. Overall, the findings suggest that while data monetization presents significant opportunities for economic growth and innovation, it also requires careful management to ensure equitable and sustainable outcomes within the digital economy ecosystem.

Discussion

The findings presented in Table 1 provide a comprehensive understanding of data monetization as a new economic asset within the digital economy ecosystem, aligning with the primary objective of this study to analyze how data functions as an economic asset through its value creation mechanisms, monetization pathways, and governance structures. The discussion reveals that the transformation of data from a by-product of digital activities into a strategic economic resource represents a fundamental shift in modern economic systems. This shift is not merely technological but also structural, as it redefines how value is created, distributed, and controlled across digital ecosystems. In this context, data has emerged as a core driver of economic power, innovation, and competitiveness.

One of the most significant insights from the analysis is the conceptual transition of data from “information” into a formalized economic asset. As highlighted in Table 1, personal and behavioral data, along with user engagement metrics, are increasingly treated as valuable assets that contribute to firm valuation and future revenue potential. This finding is consistent with Birch et al. (2021), who argue that the financialization of data has enabled digital firms to transform user activity into economic capital. Similarly, Hackfort et al. (2024) emphasize that platform-based companies do not merely monetize raw data but also capitalize on user engagement indicators, which function as predictive metrics for long-term profitability. Gawer (2021) further reinforces this perspective by explaining that digital platforms operate as ecosystems where data serves as the central coordinating mechanism, enabling firms to orchestrate interactions and extract value from multiple stakeholders. These findings collectively indicate that data has become a foundational asset in the digital economy, shaping both firm strategy and market structure.

The analogy of data as the “oil of the digital economy” provides an important conceptual framework for understanding its economic significance. However, the findings underscore that data, like oil, requires refinement through processes such as collection, storage, and analysis to generate value. The integration of advanced technologies particularly artificial intelligence (AI), big data analytics, and the Internet of

Things (IoT) has significantly enhanced the capacity to extract value from data. Butaboev et al. (2025) highlight that the effective utilization of big data can drive productivity gains and improve efficiency across sectors, contributing to macroeconomic growth. This is further supported by Virani (2023), who notes that organizations that leverage data analytics are better positioned to make informed decisions and maintain competitive advantage. Firouzi et al. (2022) also emphasize the role of IoT in generating real-time data streams that can be monetized through predictive analytics and automation. These findings suggest that the value of data is inherently linked to technological capabilities, making digital infrastructure a critical determinant of economic success in the data-driven economy.

In examining the pathways of data monetization, the findings identify three primary mechanisms: internal value enhancement, direct data commercialization, and data-driven services. The first pathway—enhancing products and operational efficiency—represents an indirect form of monetization in which data is used to optimize processes, reduce costs, and improve service quality. This aligns with the findings of Butaboev et al. (2025) and Firouzi et al. (2022), who demonstrate that data-driven optimization can significantly enhance organizational performance. The second pathway—direct monetization through data marketplaces and trading platforms—reflects a more explicit commodification of data, where data is treated as a tradable asset. Studies by Jnr (2023) and Zhang et al. (2023) highlight the emergence of data marketplaces as key platforms for facilitating data exchange, while Sánchez et al. (2024) and Wang and Song (2024) emphasize the role of blockchain and decentralized ledger technologies in enabling secure and transparent data transactions. The third pathway—data-driven services such as targeted advertising and insights-as-a-service—illustrates how data can be monetized through platform-based business models. Birch et al. (2021) and Hackfort et al. (2024) show that these models rely heavily on user data to generate revenue, reinforcing the centrality of data in digital business strategies.

Despite these diverse monetization pathways, the findings also reveal significant structural characteristics of the digital economy ecosystem, particularly the emergence of platform-based and network-driven models. Data ecosystems are increasingly organized around data marketplaces, data spaces, and exchange networks that facilitate data sharing and collaboration. Otto (2022) and Hayashi et al. (2021) emphasize the importance of interoperability, data sovereignty, and trust in enabling these ecosystems to function effectively. However, the analysis also highlights the prevalence of hub-and-spoke structures, where a small number of dominant platforms control the majority of data flows and economic value. Gawer (2021) argues that this concentration of power is a defining feature of digital platform ecosystems, while Hayashi et al. (2021) note that it can lead to imbalances in value distribution and reduced competition. This structural dynamic raises important questions about the sustainability and inclusivity of the data economy.

The emergence of decentralized data economies offers a potential alternative to the centralized platform model. The findings indicate that technologies such as blockchain, distributed ledger technology (DLT), and IoT are enabling new forms of data monetization that prioritize transparency, security, and user participation. Jnr (2023) and Sánchez et al. (2024) highlight the development of decentralized data marketplaces, particularly in smart city and energy sectors, where individuals and organizations can directly monetize their data through automated contracts and payments. Wang and Song (2024) further emphasize that tokenization and smart contracts can facilitate more efficient and equitable data transactions. These developments suggest that decentralization has the potential to democratize data ownership and reduce the

dominance of large platforms. However, the implementation of such systems remains in its early stages, and their scalability and regulatory implications require further investigation.

A critical issue identified in the analysis is the asymmetry in data ownership and value distribution within the digital economy. As shown in Table 1, large technology companies are able to extract significant economic value from data, while individuals and smaller entities often receive minimal compensation. This finding is consistent with Birch et al. (2021), who describe this phenomenon as a form of “data capitalism,” where economic power is concentrated among those who control data resources. Koskinen et al. (2023) further argue that this asymmetry is reinforced by structural inequalities in access to data and analytical capabilities. Sánchez et al. (2024) and Firouzi et al. (2022) also highlight that data producers—such as users and smaller firms—are often excluded from the value creation process, leading to imbalanced economic outcomes. This issue represents a major challenge for the development of a fair and inclusive data economy.

In addition to economic inequality, the monetization of data raises significant ethical and governance concerns. Issues related to data privacy, ownership rights, and surveillance have become increasingly prominent in the digital economy. Hackfort et al. (2024) discuss the concept of “surveillance capitalism,” where user data is systematically collected and monetized without adequate transparency or consent. Similarly, Koskinen et al. (2023) highlight the risks associated with data exploitation and the lack of effective regulatory frameworks. Birch et al. (2021) also introduce the concept of “data colonialism,” which refers to the extraction of data from less developed regions by more powerful entities, resulting in unequal economic benefits. These concerns underscore the need for robust governance mechanisms that can balance economic innovation with ethical considerations and individual rights.

To address these challenges, the findings emphasize the importance of developing comprehensive data governance frameworks. Regulatory initiatives such as data protection laws, data sovereignty policies, and ethical guidelines play a crucial role in ensuring the responsible use of data. Liu (2020) highlights the significance of regulatory frameworks such as GDPR in protecting individual privacy and establishing clear rules for data usage. Otto (2022) and Hayashi et al. (2021) propose the concept of data spaces as a governance model that enables secure and controlled data sharing while preserving data ownership. Ding et al. (2025) further emphasize the need for adaptive governance models that can keep pace with technological advancements. These frameworks are essential for creating a balanced data economy that promotes innovation while safeguarding individual and societal interests.

The discussion also highlights the evolving nature of research on data monetization, as reflected in the increasing number of studies published between 2020 and 2025. This growing body of literature indicates a shift towards more complex and interdisciplinary approaches that integrate economic, technological, and governance perspectives. Recent studies focus on dynamic data valuation, the integration of emerging technologies, and the design of inclusive value-sharing mechanisms. Wang and Song (2024) emphasize the importance of developing fair incentive systems to encourage data sharing, while Hayashi et al. (2021) and Otto (2022) highlight the need for cross-sectoral collaboration in building sustainable data ecosystems. These trends suggest that the future of data monetization will be shaped by the interplay between technological innovation and institutional development.

Overall, the findings confirm that data monetization represents a transformative force in the digital economy, redefining the nature of economic assets and value creation. Data is no longer a passive resource but an active driver of economic activity, enabling

new business models and revenue streams. However, the benefits of data monetization are accompanied by significant challenges related to governance, ethics, and inequality. Therefore, achieving a sustainable and inclusive data economy requires a holistic approach that integrates technological innovation, regulatory frameworks, and equitable value distribution mechanisms. This study contributes to this understanding by providing a comprehensive analysis of data monetization as a new economic asset and highlighting the key factors that shape its role within the digital economy ecosystem.

CONCLUSIONS

In conclusion, this study confirms that data monetization has evolved into a fundamental mechanism that positions data as a new economic asset within the digital economy ecosystem, characterized by its ability to generate value through integrated processes of collection, analysis, and utilization. The findings demonstrate that data creates economic value through multiple monetization pathways, including operational optimization, direct commercialization, and data-driven services, all of which are supported by advanced technologies such as artificial intelligence, big data analytics, and IoT. However, the study also reveals that the benefits of data monetization are unevenly distributed due to structural asymmetries, platform dominance, and limited participation of data producers, raising critical governance and ethical concerns. Therefore, in addressing the research objective, it can be concluded that the effective positioning of data as an economic asset requires not only technological capability but also the development of inclusive governance frameworks, equitable value-sharing mechanisms, and transparent regulatory systems to ensure that the digital economy operates in a fair, sustainable, and balanced manner.

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