Research on the listing of enterprise data assets in the digital economy era —— Taking Mysteel as an example

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Abstract. In the context of rapid digital economic development, data has become a critical production factor. The accounting recognition of data assets, as a key initiative in corporate digital transformation, plays a vital role in reflecting enterprises' true value and driving innovation. However, companies face numerous challenges in implementing data asset accounting practices. This paper employs case study methodology, using Mysteel as a representative example to thoroughly analyze its practical implementation process and impacts. The research results indicate that the accounting recognition of data assets is not only feasible but also has a positive impact on both the internal and external operations of the enterprise. However, in practical applications, it faces challenges such as costs, market fluctuations, the rate of capitalization of research and development, and the commercialization of technology. Based on these findings, this study proposes targeted countermeasures and suggestions from the perspectives of enterprises, industries, and policies. These suggestions provide practical references for enterprises to carry out data asset accounting, indicate the direction for establishing a standardized industry system, and provide a basis for policy makers to improve policies. This research can promote the effective management and development of enterprise data assets in the digital economy era. Moreover, the countermeasures and suggestions proposed in this study can also provide valuable references for other enterprises.

Keywords: Digital economy, data assets, data asset on balance sheet, Mysteel.

1. Introduction

In the current era of booming global digital economy, information technology is advancing rapidly, with data becoming a core production factor that drives corporate innovation and economic growth. China's digital economy continues to expand, and industrial digital transformation is accelerating. The assetization of data has become an inevitable requirement for the deepening development of the digital economy. However, the traditional accounting system lacks clear regulations on data asset recognition and measurement, making it difficult to accurately reflect the value of data assets in financial statements. This affects the comprehensive representation of corporate financial status and stakeholders' evaluation of enterprise value [1].

The inclusion of data assets in financial reporting carries profound significance: For enterprises, it helps clarify data value, enhances data management and utilization, and strengthens core competitiveness; for industries, it facilitates fair competition among businesses and optimizes resource allocation, promoting healthy industry development; from a macroeconomic perspective, it provides accurate financial information support for national digital economy policy formulation, driving standardized growth of the digital economy [2].In exploring the critical issue of data asset accounting, numerous domestic and international studies have developed rich theoretical and practical insights from various perspectives. The core driving forces for data asset accounting stem from both theoretical foundations and urgent practical needs. Zhang et al., starting from conceptual definitions, clarify that data assets are profit-generating datasets acquired through active or passive means, which, although not yet widely incorporated into corporate accounting, are crucial for operational efficiency and financial statement authenticity. Their proposal to advance data capitalization research fundamentally reveals the inherent logic behind data asset accounting, providing a conceptual basis for its implementation [3]. Xia, however, emphasizes from a risk control perspective that data assets' characteristics—such as replicability, unique valuation models, and

contextual dependencies—create significant complexity in their financial statement recognition, potentially triggering audit risks. For instance, management might inflate data asset values to embellish reports, a phenomenon that underscores the urgency of standardizing data asset accounting —— Only through clear accounting rules can potential risks be effectively mitigated and financial information quality ensured [4]. Regarding specific implementation methods, existing research has proposed feasible approaches focusing on measurement methodologies, yet the lack of practical regulations remains the primary obstacle. Zhang and colleagues proposed a phased measurement framework addressing the unique characteristics of data assets. The initial measurement phase employs historical cost accounting to ensure objective valuation, while subsequent measurements adopt the lower of fair value or current value, balancing dynamic asset fluctuations with prudence principles. This provides enterprises with a practical operational framework [3]. However, as traditional accounting systems lack explicit recognition and measurement standards for data assets, companies face operational uncertainties in implementing data asset recognition and reporting processes within existing frameworks. The significance of data asset accounting manifests across multiple dimensions: corporate, industry, and macroeconomic levels, all closely tied to data value realization. For enterprises, this process enables precise quantification of data value, optimizing management strategies and enhancing operational efficiency to strengthen core competitiveness. For industries, unified accounting standards reduce information asymmetry caused by data accounting discrepancies, fostering fair competition and resource optimization. At the macro level, accurate financial data on enterprise assets provides reliable foundations for national digital economy policies, driving orderly development of the digital sector [5]. Research by Badewitz et al. further highlights that while data inherently holds immense value, much of this potential gets wasted when it becomes disconnected from its original context and difficult to reuse. The inclusion of data assets in financial statements serves as a critical step in data assetization, enabling data to become tradable market assets. This transformation unlocks the full economic value of data elements, injecting fresh momentum into economic growth [6]. However, practical implementation faces multiple challenges, with risk management and valuation issues being particularly prominent. Xia's study reveals significant material misstatement risks during the inclusion process, including management's potential to inflate data asset values for profit motives, lack of standardized valuation methods leading to uncertainty, and inadequate internal data governance systems and controls. Moreover, auditors 'insufficient expertise in data asset characteristics and accounting rules, or the use of inappropriate audit methods, further exacerbate detection risks, creating obstacles to successful inclusion [4]. Badewitz et al. emphasize that data valuation remains a core challenge —— achieving a thriving data market requires establishing reasonable pricing mechanisms. Current research indicates that data's non-rivalrous nature and context-dependent value pose theoretical and technical hurdles for scientific valuation, directly impacting the accuracy of data asset inclusion values [6]. In summary, while the recognition of data assets in financial statements holds significant theoretical value and can drive economic development in practice, critical challenges remain unresolved—including measurement standards, risk management, and valuation mechanisms. Future research should focus on these core issues to develop robust theoretical frameworks and practical solutions for the proper accounting and measurement of data assets in financial reporting systems.

This study focuses on "data asset accounting" through case analysis, using Mysteel as a research case. By collecting financial data and annual reports, we conduct an in-depth analysis of its data asset accounting practices. The aim is to summarize lessons learned, identify universal patterns and insights, and provide practical references for addressing corporate data asset accounting challenges.

2. Case background

As a leader in commodity data services, Shanghai Steel Union has made remarkable achievements in data asset management and core business development.

Mysteel demonstrates both a solid foundation and proactive initiatives in data asset management. The company maintains a network of over 4,000 data collection and market service personnel across major Chinese cities and overseas locations. Its extensive data accumulation ensures comprehensive coverage, accuracy, and timeliness in bulk commodity data. Following the implementation of China's Interim Provisions on Accounting for Enterprise Data Assets in 2024, Mysteel became one of the first enterprises to "incorporate data into financial statements." In Q32024, data assets accounted for over 1% of intangible assets in its financial disclosures under the "Intangible Assets" category. The company has also made significant strides in data rights confirmation, transactions, and financing: establishing a robust rights confirmation mechanism to clarify ownership and usage rights; creating integrated data circulation channels to facilitate value conversion; and exploring financial support mechanisms through data assets [7].

In its core business sectors, Mysteel's operations encompass commodity information services and e-commerce transactions. Taking the "Steel-Silver E-Commerce" platform as an example, while facing initial challenges in 2013, it achieved profitable growth through accumulated data assets. By 2022, data-driven services such as market analysis reports and customized data solutions had generated substantial revenue [8].

3. Mysteel data asset accounting treatment and disclosure

3.1. Data asset accounting treatment

Shanghai Steel Union conducts scientific classification, identification, value measurement and amortization of data assets in accordance with the Interim Provisions, Accounting Standards for Enterprises and other policies [9].

3.1.1. Classification and identification

According to the regulations, qualified data assets are mainly divided into inventory and intangible assets: data assets held and eventually used for sale are recognized as inventory; data assets owned or controlled and capable of producing economic benefits for the predetermined purpose are recognized as intangible assets [10].

Shanghai Steel Union's data assets are not used for direct sales but serve as core infrastructure for steel information services and e-commerce trading platforms. These assets provide content foundations for information products (such as steel price data and industry supply-demand statistics) that support transaction decisions on e-commerce platforms. Consequently, the company classifies qualified databases within its 13-category asset portfolio (including steel products, iron ore, scrap steel, etc.) as intangible assets. The classification process follows Accounting Standard for Business Enterprises No.6 —— (Intangible Assets) and the Interim Provisions on Accounting Treatment of Enterprise Data Assets, with further determinations based on asset holding purposes. All accounting treatments adhere to the prudence principle [11].

3.1.2. Valuation

Shanghai Steel Union employs the historical cost method to evaluate data assets, determining their value by aggregating direct costs incurred during data collection processes—including labor compensation, satellite remote sensing procurement fees, and web crawler technology development costs (data is searched from Xie, 2025). The specific procedure involves recognizing verifiable expenditures such as manual labor hours, equipment depreciation, and third-party data acquisition fees during statistical compilation as intangible assets in accordance with the "Provisional Regulations on Accounting Treatment of Enterprise Data Assets". Using the straight-line method over

five years, the accumulated amortization reached 0.1371 million RMB by 2024, with the year-end book value standing at 2.1584 million RMB (data is searched from Sina Finance, 2024).

3.1.3. Write-off processing

Shanghai Steel Union has adopted the sum-of-the-years '-digits method for data asset amortization, with a five-year amortization cycle. This accelerated amortization approach features higher initial amortization amounts that gradually decrease over time, aligning with the characteristic of data assets that exhibit high initial value but diminishing value due to reduced timeliness. During calculation, the annual amortization amount is determined by multiplying the balance of the asset's original value minus the estimated net residual value by a decreasing fraction where the numerator represents remaining service years and the denominator is the sum of estimated service years (the numerator decreases with service years while the denominator remains constant: 5+4+3+2+1=15).

3.2. Disclosure of data assets

3.2.1. Disclosure process

Driven by policy initiatives, Mysteel has steadily advanced its data asset accounting process. In Q3 2024, the company recorded 83.1 million RMB in data asset accounting. The 2024 annual report revealed 215.8 million RMB in data assets, with this figure being disclosed for two consecutive reporting periods. Projections indicate that the scale of data asset accounting will exceed 50000 million RMB in 2025, which is expected to directly enhance net assets.

Table 1. Data assets on the balance sheet of Mysteel at the end of 2023-2024

Project	End of 2023	Q3 2024	End of 2024
Immaterial assets (million RMB)	1958.3	1992.7	2142.0
Among them: data assets (million RMB)	-	83.1	215.8

Source: Mysteel quarterly report and annual report

In the quarterly report and 2024 annual report of Shanghai Steel Union, the company realized data assets on the balance sheet for the first time. The amount of data assets reached about 215.8 million RMB at the end of the year, which was a breakthrough from scratch in 2023, reflecting its substantial progress in promoting the process of data asset.

3.2.2. Data asset management and product layout

Shanghai Steel Union's data sources are categorized into two types: manually collected (with clear ownership rights obtained through phone or email) and automatically acquired (paid or publicly available, obtained via remote sensing satellites, web crawlers, etc.). The company implements an "Eight-Step Workflow Method" to standardize data collection and compilation processes, ensuring data quality (see Table 2). To date, it has established 22 major databases and 69 secondary databases, covering 10,223 subcategories with a total data volume exceeding 10.2TB.

Table 2. Eight-step workflow

<table>
<tr><td colspan="2">Flow path</td><td colspan="2">Stage</td><td colspan="2">Method</td></tr>
<tr><td colspan="2">1.Market research</td><td colspan="2" rowspan="3">The collection phase</td><td colspan="2" rowspan="3">• User needs drive the design of key data metrics
• The data collection samples cover representative enterprises in the industry
• One Star, Three Platforms offers an alternative perspective on the world
• Digital call archives are traceable and verifiable</td></tr>
<tr><td colspan="2">2. Establishment of a sample bank</td></tr>
<tr><td colspan="2">3.Collection and warehousing</td></tr>
<tr><td colspan="2">4.Verification and classification</td><td colspan="2" rowspan="4">Formulation stage</td><td colspan="2" rowspan="4">• Multi-dimensional cross verification of production and supply
• Different benchmarks are standardized and automatically converted
• AI anomaly warning
• 1.5 times the fourth quarter difference outlier determination
• Double weighting of the weighted average</td></tr>
<tr><td colspan="2">5. Data standardization</td></tr>
<tr><td colspan="2">6.Outlier treatment</td></tr>
<tr><td colspan="2">7.Data compilation</td></tr>
<tr><td colspan="2">8.Data dissemination</td><td colspan="2">Release phase</td><td colspan="2">• Fixed release time, release frequency, release channel
• One-click release on PC, mobile terminal, data terminal and other platforms</td></tr>
<tr><td>Objective</td><td>Independence</td><td>Just</td><td>Accuracy</td><td>Timely</td><td>Overall</td></tr>
<tr><td colspan="6">Working principles</td></tr>
</table>

Image source: WeChat Official Account "China Information Association Industrial Internet Branch", "Typical Case | Mysteel: Commodity and Related Industry Data Creates Value for Users", released on July 16,2024

Mysteel has been actively expanding its data product portfolio. The company has listed 10 products, including the "Comprehensive Data Query for Renewable Resources", on the Shanghai Data Exchange, and two products such as the "Mysteel EBC Platform" on the Guiyang Big Data Exchange. For instance, the "Ganglian Data Intelligence Edition-Ferrous Metals Sector" covers over 380,000 indicators, while the "Ganglian Data Intelligence Edition Terminal" manages more than 2.36 million indicators with daily updates.

4. Financial impact

4.1. Financial analysis of data assets on the balance sheet

4.1.1. Operating income and net profit

In 2024, the total revenue of Mysteel was 8.134 million RMB, the operating cost was 8.099 million RMB, and the net profit was 0.016 million RMB. The cost and income were close to each other, and the profit margin was narrow, but the overall profit was good.

Table 3. Mysteel's profit in 2024

Project	Amount (Million RMB)
Operating receipt	8.134
Cost in business	8.099
Net profit to parent company	0.016

Source: Mysteel Annual Report

When data assets are recognized on the balance sheet, certain expenditures are reclassified from operating costs to capitalization, thereby reducing current costs. This process simultaneously drives the expansion of high value-added business segments, fueling net profit growth. Should the 2025 accounting scale exceed 50 million RMB, it is projected to boost profits by over 30% (data is searched from AI Era Breakthrough Guide, 2025).

4.1.2. Intangible assets

In 2024, Mysteel's self-developed data assets increased intangible assets by 2.2955 million RMB, with a book value of 2.1584 million RMB at the end of the period. Using the straight-line method over five years, the accumulated amortization for the year was 0.1371 million RMB (data is searched from Netease Subscription, 2025). Although this amortization temporarily reduces profits in the short term, data assets are expected to drive revenue growth through long-term business optimization (such as precision marketing and supply chain efficiency improvements).

In the third quarter of 2024, the steel database was added to the table, and in the fourth quarter, the iron ore database was added to the table, reflecting the gradual recognition of the value of core data assets.

4.1.3. R & D expenditure

In 2024, Mysteel invested RMB 119 million in R&D expenditure, with RMB 2.3 million allocated to capitalization of data assets. This accounted for 1.93% of total R&D investment and 0.78% of net profit for the period (see Table 4). While R&D expenditures were fully expensed from 2022 to 2023, capitalization was implemented for the first time in 2024, indicating the existence of projects meeting the "technologically feasible and economically beneficial" criteria. The capitalization reduced current expense expenditures and marginally increased profits, though the long-term impact of subsequent amortization requires careful monitoring.

Table 4. The company's R&D investment amount and the proportion of operating revenue in the past three years

Project	2022	2023	2024
R&d investment amount (Million RMB)	119.8	126.7	119.2
R&d investment as a percentage of operating revenue	0.16%	0.15%	0.15%
Capitalization of R&D expenditure (Million RMB)	0.00	0.00	2.3
The proportion of capital r&d expenditure to R&D investment	0.00%	0.00%	1.93%
The proportion of capitalized R&D expenditure to net profit in the current period	-	-	0.78%

Source: Mysteel Annual Report

4.2. Analysis of the impact path of data assets on the balance sheet

4.2.1. Internal corporate implications

(1) Business process optimization: integrate downstream demand data to develop customized reports to assist customers in purchasing decisions; monitor supply chain indicators to reduce transaction costs and improve satisfaction.

(2) Perfect data management system: integrate external data such as industry technology and policy to build a situation awareness system; adopt distributed storage technology to ensure data security, introduce AI algorithm to predict price trend and support decision-making.

(3) Technological innovation and model exploration: apply blockchain to strengthen the authenticity of supply chain financial data; build a data ecosystem with upstream and downstream partners, and expand revenue channels by productizing data according to the path of Ali Cloud.

4.2.2. External impacts on the enterprise

(1) Differentiated competitive advantages: analyze regional steel demand trends, prioritize the layout of new products; optimize production capacity and logistics, and enhance market discourse power.

(2) Improved investment attractiveness: The inclusion of data assets in the balance sheet makes the value of assets more transparent, attracts long-term investors and expands the source of funds.

(3) Industry demonstration effect: promote the establishment of data asset standards in the steel industry, share management experience, and drive the digital transformation of the whole industry.

5. Conclusions

This study analyzes Mysteel as a case study and draws the following conclusions: The accounting recognition of data assets demonstrates practical feasibility. By categorizing data assets as intangible assets, applying historical cost measurement, and amortizing them using the sum-of-the-years '-digits method, Mysteel became one of the first enterprises to comply with the Interim Provisions. It achieved a breakthrough in data asset accounting from scratch by 2024, with projections indicating the scale will exceed 500 million RMB by 2025. This validates the critical role of data asset accounting in reflecting enterprises' true value. Simultaneously, data asset accounting exerts multi-dimensional positive impacts on corporate operations: internally driving business optimization, management refinement, and technological innovation; externally enhancing competitiveness, boosting investment appeal, and creating industry benchmarks. However, challenges remain in practice, including tight profit margins due to cost control pressures, market volatility affecting measurement and amortization, a low R&D capitalization rate of 1.93%, and room for improvement in technology commercialization efficiency.

This study offers three key policy implications. At the enterprise level, companies should enhance lifecycle management by implementing the "Eight-Step Process Method" to standardize data collection, cleansing, storage, and application workflows, while strengthening rights confirmation mechanisms to mitigate legal risks. They should optimize measurement and amortization practices by introducing a "dynamic discount rate" based on the income approach, with amortization periods adjusted according to data update frequency—e.g., 3 years for high-frequency data and 8 years for basic data. Additionally, balancing costs and value is crucial: leverage data-driven supply chain optimization to reduce expenses, while increasing investments in high-value-added services like data subscriptions to boost gross margins. At the industry level, trade associations should lead the establishment of standardized systems for unified data asset classification, measurement, and disclosure to resolve inter-enterprise information incomparability issues. Platforms should be developed by referencing Shanghai Steel Union Exchange's listing experience, with clear data trading pricing mechanisms to facilitate circulation. Policy-wise, guidelines should be refined through industry-specific implementation rules that distinguish data assets from traditional intangible assets. Support should include tax incentives for data-related R&D, pilot programs for data asset collateral financing, enhanced regulatory training, improved disclosure oversight, and promotion of Shanghai Steel Union's best practices to enhance SMEs' operational capabilities.

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