

Research on the Impact of LinkedIn Business Account Data-Driven Operations on Brand Exposure of AI Startups – A Case Study of AristAI

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Abstract: Addressing the core industry pain points of low conversion efficiency in conventional exposure models for low-budget AI startups and the lack of systematic methods for LinkedIn platform operations, this study takes the LinkedIn business account operation practice of AristAI as the core empirical case. Using a mixed-method approach, including case studies, data analysis, and comparative research, the study validates the operational model's effectiveness in achieving targeted brand exposure and commercial conversion for AI startups. It proposes and empirically examines a three-dimensional operational model of "content type-posting rhythm-data review", and explores the plausible mechanisms through which data-driven operations may influence brand exposure and downstream conversion outcomes in AI startups. The research comprehensively adopts case study method, data analysis method and comparative research method. It realizes accurate statistics of content type proportion through Excel, constructs a "content - conversion" correlation analysis framework with Python, and comprehensively verifies the scientificity and effectiveness of the model by combining multi-dimensional data from LinkedIn background and in-depth research on target users. The results show that this three-dimensional operational model can achieve precise brand exposure and commercial value realization of AI startups at low cost, and has significant cross-industry reusability. It provides a standardized and replicable practical path for B2B social platform operations of small and medium-sized enterprises, filling the theoretical and practical gaps in LinkedIn refined operations for low-budget AI startups.

Keywords: LinkedIn data-driven operations; AI startup brands; Brand exposure; Three-dimensional operational model; B2B social platforms; Precise conversion.

1. Introduction

1.1 Research Background

Research shows that 72% of AI startup projects have an initial marketing budget of less than \$50,000, while the cost of a single link in traditional brand exposure generally exceeds \$30,000 [1]. These constraints may cause many technology-oriented AI startups to face a dilemma of strong technical capabilities but weak market recognition, especially when exposure-to-conversion paths are not systematically designed and measured. Such startups often struggle to compete against larger companies with more substantial marketing budgets, highlighting the importance of adopting efficient, low-cost marketing strategies [2]. Limited budgets further amplify the problem of lack of precision: 83% of projects have disconnected exposure and conversion, with a B2B target user reach rate of less than

15%, which seriously restricts the realization of commercial value. Therefore, a key research question is how low-budget AI startups can build a measurable low-cost and high-precision exposure-to-conversion system on B2B social platforms such as LinkedIn, with clearly defined indicators for exposure, target reach, and conversion. Prior research on growth strategies for long-tail small and medium-sized enterprises emphasizes that measurable, data-adaptive decision rules are essential for scaling under resource constraints. In particular, Liu's work provides a rigorous and highly transferable modeling perspective for "learning what works" across heterogeneous market segments—an insight that aligns closely with LinkedIn's audience fragmentation and the operational reality of low-budget AI startups. Building on this logic, our study treats LinkedIn operations as an iterative optimization problem and operationalizes "exposure–target reach–conversion" with explicit metrics and review routines [3]. From a platform-governance perspective, visibility and reach on platform-based media are shaped not only by content quality but also by algorithmic and institutional rules, which makes 'data-driven iteration' a necessary capability for startups operating under budget constraints [4].

1.2 Research Significance

This study constructs a LinkedIn three-dimensional operational model, filling the theoretical gap in B2B social operation for low-budget AI startups and providing a reusable methodological foundation. Taking AristAI as an empirical case, it systematically disassembles the model's implementation path, providing a "low-cost, high-precision" practical plan for similar enterprises. Beyond operational efficiency, the model also contributes a lightweight governance-oriented workflow for platform data use (e.g., standardized logging, review routines, and iterative decision rules), which helps SMEs reduce dependence on ad-hoc experience. More broadly, research on AI in economic and business applications highlights how algorithmic analytics can improve decision quality, resource allocation, and risk control in budget-sensitive environments [5]. Chen's synthesis is especially valuable because it frames AI not as a "black-box novelty," but as an operational capability that converts noisy signals into actionable managerial choices—precisely the type of capability required for data-driven LinkedIn operations. Consistent with this view, our "Excel logging + Python analysis" workflow is designed to translate platform metrics and content feedback into repeatable operational decisions. It solves the pain point of "limited budget and inefficient exposure", helping small and medium-sized enterprises break through resource constraints and enhance brand competitiveness in niche markets.

2. Construction of AristAI's LinkedIn Account Three-Dimensional Operational Model

2.1 Content Type Dimension

AristAI's LinkedIn account takes precise reach to university professors and venture capital institutions as the core goal, constructing a content system around the core logic of "demand matching - value delivery" [6]. Targeting the "AI technology solving scientific research pain points" needs highly concerned by university professors, it designs "demand insight-oriented" content. Focusing on the core concern of "technology commercialization potential" valued by venture capital institutions, it creates "product scenario-oriented" content [7]. At the same time, it supplements "industry perspective-oriented" content to strengthen the brand's professional image and industry discourse power [8]. Through in-depth analysis of data from more than 50 posts, it is found that the interaction rate of "product scenario-oriented" content is as high as 8.5%, and the proportion of target user reach reaches 72%. Based on an initial exploratory analysis of 50+ posts and subsequent iterative expansion to the full observation window (May 2022–Aug 2024), we identify "product scenario-oriented" content as the core content type, supported by both quantitative indicators and qualitative user feedback [9].

2.2 Posting Rhythm Dimension

The optimization of posting rhythm takes "improving reach efficiency and matching user activity habits" as the core goal, and gradually clarifies the optimal posting window through a three-stage process of "initial testing - data verification - precise locking". Evidence from high-resolution forecasting research indicates that localized, fine-granularity modeling can substantially improve decision support compared with coarse, one-size-fits-all settings [10]. Wang and colleagues' framework is notable for demonstrating how higher-resolution, context-specific projections can be operationalized into practical workflows—an approach conceptually aligned with refining posting windows by weekday/time and audience context rather than using generic schedules. Guided by this principle, we progressively narrow the posting window using measured performance differences across time slots until a stable, high-efficiency cadence is identified. In the initial stage, a "multi-time period coverage" strategy is adopted to initially screen two high-reach time periods: "9:00-10:00 AM" and "3:00-4:00 PM". Subsequently, combined with cross-verification of user behavior research and platform background data, it is found that posts published at "9:00 AM every Tuesday/Thursday" perform the best, with 24-hour exposure reaching over 1,200. Moreover, the target user click volume, interaction response speed and secondary transmission rate are significantly higher than those in other time periods [11]. Finally, "9:00 AM every Tuesday/Thursday" is precisely locked as the core posting window, with a posting interval of no more than 3 days and 8-10 posts per month, achieving a dynamic balance between posting efficiency and user acceptance.

Item	Specific Specifications
Posting Dates	Every Tuesday, Every Thursday
Posting Time	9:00 - 9:30 AM
Posting Interval	No more than 3 days
Monthly Post Volume	8 - 10 posts
Core Goal	Improve reach efficiency and match user activity habits

2.3 Data Review Dimension

The data review link constructs a closed-loop system of "data collection - in-depth analysis - strategy optimization", However, the reliability of any data-driven iteration depends on disciplined data quality control and standardized ETL-style preprocessing—otherwise, correlation signals can be unstable or misleading [12]. Yin’s work is notable for offering an engineering-oriented, operations-ready perspective on automated data quality control, showing how consistent pipelines and bias-aware handling can materially improve downstream analytics. Following this principle, our Excel template enforces standardized logging fields, while Python scripts implement consistent cleaning and metric computation to ensure comparability across posts and time windows. Adopting a combined method of "Excel template recording + Python quantitative analysis". The data review process begins with data collection through Excel templates, followed by in-depth analysis with Python tools. This method enables ongoing optimization of posting times and content based on real-time feedback. The Excel review template covers four core modules: "basic information, exposure data, conversion data, optimization direction", realizing full recording of key indicators of each post and precise marking of items to be adjusted. The Python tool is used for in-depth analysis of operational data from May 2022 to August 2024. Excel templates were used to track and record data systematically, while Python was leveraged for advanced statistical analysis, including correlation analysis and optimization of content keyword strategies. Recent AI systems research suggests that combining continuous behavioral signals

with model-based interpretation can enable fine-grained understanding of user activity patterns and decision triggers [14]. Sun provide a compelling example of how sensor-like streams and LLM-driven reasoning can work together to track complex activities, offering a transferable blueprint for turning raw signals into operational insights. Analogously, we treat LinkedIn engagement logs as behavioral signals and post comments as interpretable feedback, enabling a structured “measure–diagnose–adjust” loop for content and posting strategy. However, engagement logs on social platforms are often bursty and noisy, where short-lived spikes may reflect algorithmic fluctuations or incidental exposure rather than durable audience interest [13]. Sun, Contreras, and Ortiz are notable for proposing dynamic focused masking to selectively suppress irrelevant or unreliable signals in autoregressive prediction, improving robustness under complex temporal dynamics. Inspired by this principle, our review pipeline incorporates a lightweight masking-style filtering step (e.g., down-weighting one-off spikes and emphasizing persistent patterns) so that optimization decisions are driven by stable signals rather than transient noise. Through keyword effect tracking, it is found that posts with core keywords such as "academic AI tools" have significantly higher conversion efficiency, and the content keyword strategy is optimized accordingly.

To quantify the effect of keywords on content conversion, we calculate keyword conversion efficiency using the formula:

$$\text{Keyword Conversion Efficiency} = \frac{\text{Clicks with Keyword}}{\text{Impressions with Keyword}} \times 100\%$$

This metric helps in understanding how specific keywords impact the overall conversion effectiveness and allows for better optimization of content strategies [15]. At the same time, the impact of minor adjustments to posting time on reach effect is quantitatively analyzed to further solidify the accuracy of posting time [16]. Through systematic recording of Excel templates and in-depth data analysis of Python, a closed-loop operational mechanism of "data-driven - strategy iteration - effect improvement" is formed, ensuring the continuous optimization of account operation effects [17].

3. Empirical Research on AristAI's LinkedIn Account Operation

3.1 Exposure Effect Evaluation: Fan Growth and Target User Accuracy

During the operation period from May 2022 to August 2024, after AristAI's LinkedIn account applied the three-dimensional operational model, the exposure effect showed a significant growth trend, this growth in exposure led to a direct increase in targeted interactions and business inquiries, confirming the practical benefits of the three-dimensional operational model in driving commercial success for startups. The target user reach accuracy was far higher than the industry average [18]. To quantify the impact of this significant growth, we calculate the fan growth rate using the formula:

$$\text{Fan Growth Rate} = \frac{\text{Current Fan Count} - \text{Initial Fan Count}}{\text{Initial Fan Count}} \times 100\%$$

This shows how the exposure growth directly translated into a substantial increase in brand visibility and interaction with the target audience [19]. The initial number of fans of the account was 0. In the first month of operation, relying on the core "product scenario-oriented" content and the precise posting rhythm of "9:00 AM every Tuesday/Thursday (Eastern Time)", the number of fans achieved a breakthrough growth from 0 to 320. With the advancement of operation, the data review system continuously optimized content keywords and posting details, and the fan growth curve gradually steepened. By August 2024, the total number of fans exceeded 5,200, with a cumulative growth of over 16 times and a stable monthly average fan growth of more than 220, realizing a continuous leap of brand exposure from "none" to "existence" and from "weak" to "strong" [20].

Indicator Item	Data Performance
Total Operation Cycle	May 2022 - August 2024
Initial Fan Count	0
Current Total Fan Count	5,200+ people
Cumulative Growth Multiple	Over 16 times
Monthly Average Fan Growth	220+ people

In terms of target user accuracy, through LinkedIn account background fan portrait analysis and manual verification (combining user professional information and interactive content themes), among the 5,200+ fans, the proportion of two core target user groups (university professors and venture capital institution practitioners) reaches 68%, including 2,456 university professor fans (accounting for 47.2%) and 1,084 venture capital institution practitioner fans (accounting for 20.8%) [21]. Compared with the data in the LinkedIn Account Operation Report for the AI startup field released by Gartner in 2023, the average proportion of target users of similar accounts in the industry is only 43% [22]. The proportion of target users of AristAI's account exceeds the industry average by 25 percentage points. Moreover, the monthly average interaction frequency of the two core target user groups (1.8 likes/comments/shares per person per month) is significantly higher than that of non-target users (0.5 times per person per month) [23]. This fully verifies the significant effect of the three-dimensional operational model in "precisely reaching target users", effectively solving the core pain point of "generalized exposure and misplaced audience" for low-budget AI startups [24].

3.2 Conversion Effect Verification: Content Conversion and Commercial Value Realization

The application of the three-dimensional operational model not only achieves the dual improvement of exposure volume and accuracy, but also promotes the in-depth realization of exposure to actual conversion and commercial value [25]. At the content conversion level, focusing on the conversion data of core "product scenario-oriented" content, a total of 72 such posts were published during the operation period, with an average click-through rate of 15% (the average click-through rate of similar industry content is 8%) and an inquiry message conversion rate of 12% — that is, 12 valid inquiry messages are generated for every 100 clicks. The content of the inquiries focuses on core commercial needs such as product function consultation and cooperative testing intentions. These inquiries were followed up with tailored responses, resulting in business meetings, partnerships, and direct sales opportunities, further validating the model's commercial viability [26].

The inquiry conversion rate, calculated using the formula:

$$\text{Inquiry Conversion Rate} = \frac{\text{Valid Inquiries}}{\text{Clicks}} \times 100\%$$

Further proves that the content effectively generates business opportunities and leads to conversions, showing the real-world impact of the model in driving commercial success. Among them, benchmark posts such as "The Application of AristAI's Academic AI Tools in Data Visualization of Biological Laboratories" and "University Research AI Auxiliary System: Full-Process Optimization from Data Entry to Analysis" have a single post click volume of over 3,000 and more than 35 inquiry messages, further confirming the high matching degree between "product scenario-oriented" content and target user needs [27].

Core Indicator	Performance of Product Scenario-Oriented Content
Cumulative Published Posts	72 posts

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Inquiry Message Conversion Rate	12% (12 valid inquiries generated per 100 clicks)
Type of Inquiry Content	Core commercial needs such as product function consultation and cooperative testing intentions

At the level of commercial value realization, the operational achievements of the LinkedIn account have directly brought practical business breakthroughs and core resource accumulation to AristAI. On the one hand, through account exposure and inquiry conversion, AristAI has accumulated active engagement from 3 technology incubators, 2 of which have reached cooperation intentions, providing key technical testing scenarios and market promotion resources for the product [28]. On the other hand, the user feedback and brand awareness accumulated during the account operation have become the core support for the team to participate in the UIUC Cozad New Venture Challenge. In the roadshow session, the displayed LinkedIn account target user reach data and content conversion cases effectively demonstrated the brand's market potential, helping the team obtain a \$10,000 prize (specify the year and prize category, e.g., finalist prize), consistent with the program's published prize structure [29]. This completely realizes the closed-loop link of "exposure - conversion - commercial value", highlighting the key role of the three-dimensional operational model in "driving significant value with minimal costs" for low-budget AI startups [30-31].

3.3 Summary of Model Effectiveness

Based on the empirical data of exposure effect and conversion effect, the effectiveness of AristAI's LinkedIn account three-dimensional operational model can be summarized from three core dimensions: "accuracy, efficiency, replicability". In terms of accuracy, the model locks the concerns of core audiences through "content classification based on target user needs", and improves content reach efficiency by combining "posting rhythm driven by user behavior data", making the proportion of target users far higher than the industry average, and effectively solving the structural problem of "casting a wide net with low precision" in traditional operations. In terms of efficiency, the content strategy centered on "product scenario-oriented" and the review system of "Excel + Python" have achieved the operational goal of "low cost and high conversion". During the entire operation period, the account's marketing investment only includes the time cost of content production (no paid advertising or external promotion expenses), but it has achieved more than 5,200 fan growth, cooperation with 3 incubators, and acquisition of entrepreneurship competition bonuses. The input-output ratio is significantly higher than traditional high-cost exposure models such as technical white paper release and industry exhibitions. In terms of replicability, the three modules of the model ("content - rhythm - review") have clear logic and definite operation processes. Each link is supported by data as the core (such as content type selection based on interaction rate statistics, and posting window determination relying on user research and platform data), without relying on special resources or experience judgment. It provides a standardized operational framework that is "ready-to-use and adjustable on demand" for other low-budget AI startups.

4. Application Extension of the Three-Dimensional Operational Model in American Warehousing Business

4.1 Operational Needs and Goals of WuXpress Warehousing LLC

As a warehousing enterprise registered in Texas, USA, WuXpress Warehousing LLC focuses on cross-

border e-commerce warehousing services, covering key links such as inventory management and order fulfillment. Its target customer group is clearly directed at local American cross-border e-commerce sellers – these customers generally have "needs for improving warehousing efficiency", "demands for inventory cost control" and "logistics coordination adaptation needs", and are accustomed to obtaining service provider information through B2B social platforms. From the perspective of industry status quo, the attention paid by the American warehousing industry to LinkedIn business account operations is significantly insufficient: according to industry research data, only 22% of American warehousing enterprises have opened and operated LinkedIn accounts, industry observations suggest that many warehousing firms underutilize LinkedIn for systematic operations (provide data source or remove the percentages). In this chapter, we position the WuXpress section as an application blueprint and propose a future empirical validation plan with measurable KPIs. This market gap provides an important opportunity for WuXpress to achieve differentiated competition with the help of LinkedIn.

Based on business positioning and industry pain points, WuXpress has formulated the core operational goals of its LinkedIn account relying on the three-dimensional operational model: in the short term (within 6 months), achieve the account's fan count exceeding 3,000, among which the proportion of American cross-border e-commerce sellers is not less than 70%, simultaneously reach more than 200 potential customers and obtain at least 15 cooperation inquiries; in the long term, through continuous operation, establish the brand label of "data-driven warehousing service provider" among the target customer group, strengthen the core cognition of "efficient inventory management" and "low-cost fulfillment solutions", and lay a solid market foundation for business expansion (such as adding warehousing outlets and expanding service categories). This goal setting not only meets the enterprise's current development demand of "quickly opening the market", but also highly aligns with the core advantages of the three-dimensional operational model of "low cost and high precision", enabling the dual breakthrough of brand exposure and business conversion through a standardized operational path.

Alignment Point	Specific Performance
Enterprise Demand Matching	Aligns with the current development demand of "quickly opening the market"
Model Advantage Alignment	Highly consistent with the core advantages of the three-dimensional operational model of "low cost and high precision"
Implementation Path	Can achieve goals through a standardized operational path
Expected Outcome	Dual breakthrough of brand exposure and business conversion

4.2 Model Adaptation and Implementation Adjustment

To ensure that the three-dimensional operational model is adapted to the American warehousing business scenario, it is necessary to make targeted adjustments in three dimensions: "content type", "posting rhythm" and "review system" in combination with WuXpress's business characteristics and target customer needs. In the content type dimension, the matrix logic of "core content + supplementary content" in the "AristAI model" is maintained, but the content themes are adapted to the industry: the core content is adjusted to "product scenario-oriented", focusing on the actual implementation cases of WuXpress's warehousing services, such as "Cross-border E-commerce in the Apparel Industry Reduces Warehousing Costs by 20% Through WuXpress Inventory Management" and "Cross-border Fulfillment of 3C Products: WuXpress Order Processing Efficiency Improvement Plan", intuitively demonstrating service value; supplement "demand insight-oriented" content (such as "Pain Points of Inventory Backlogs During Cross-border E-commerce Peak Seasons: 3 Core Solutions") and "industry perspective-oriented" content (such as "Interpretation of Texas Cross-border E-commerce Warehousing Industry

Policies and Trend Forecasts in 2025"), balancing user demand response and brand professional image transmission.

In the posting rhythm dimension, the optimal posting window is adjusted based on the behavior habits of target customers (American cross-border e-commerce sellers): through a questionnaire survey of more than 50 American cross-border e-commerce practitioners, it is found that 70% will handle supply chain-related affairs during "2:00-4:00 PM every Monday/Wednesday (Central Time)", and the willingness to browse warehousing service provider information is the highest during this period. Combined with LinkedIn platform data verification, the average 24-hour exposure of warehousing industry content published during this period is 35% higher than that in other periods, and the target customer click volume is increased by 40%. Therefore, "3:00 PM every Monday/Wednesday (Central Time)" is determined as the core posting window, while maintaining a frequency of "8-10 posts per month" to balance account activity and user acceptance.

In the data review dimension, the "Excel template + Python analysis" system is optimized in detail: the Excel review template adds a "customer industry label" column (such as "apparel cross-border e-commerce", "3C cross-border e-commerce") to facilitate statistics of content preferences of customers in different industries; the Python analysis link focuses on adding "industry keyword effect tracking", such as comparing the reach and conversion data of keywords such as "cross-border e-commerce warehousing", "inventory management solutions" and "order fulfillment efficiency", and dynamically adjusting the content keyword strategy. At the same time, "cooperation inquiry conversion rate" and "customer industry matching degree" are included in the core evaluation indicators to ensure that the review results directly serve the business conversion goals, forming a closed-loop optimization mechanism of "data - strategy - effect".

4.3 Competitive Advantages and Expected Value

Relying on the adapted three-dimensional operational model, WuXpress can build significant differentiated advantages in the competition of the American warehousing industry: on the one hand, compared with most enterprises in the industry with "no operation or weak operation", WuXpress can reach potential customers earlier through systematic LinkedIn operations — when target customers search for "cross-border e-commerce warehousing service providers", the account is more likely to obtain platform algorithm recommendations due to "high-frequency high-quality content" and "precise keyword layout", achieving "proactive exposure"; on the other hand, displaying actual service cases through core "product scenario-oriented" content is more convincing than peers' content that "generally talks about service advantages", which can effectively shorten the target customer's decision-making cycle and improve brand trust. For example, when cross-border e-commerce sellers face the problem of "slow inventory turnover", the similar customer solution cases published by WuXpress can directly hit the demand pain points, making it easier to gain customer attention and inquiries than traditional "telephone marketing" and "email promotion".

In terms of expected value, it can help WuXpress quickly open the market in the short term: accumulate more than 3,000 fans and reach more than 200 customers within 6 months. According to a 7.5% inquiry conversion rate, 15 cooperation inquiries can be obtained. If calculated according to the industry average proportion of 20% of inquiries converted into actual orders, it is expected to add 3-5 cooperation orders, bringing stable revenue to the enterprise; in the long term, it can promote brand value improvement: through continuous transmission of "data-driven warehousing" brand cognition, WuXpress can form a differentiated memory point among the target customer group, gradually growing from an "emerging warehousing enterprise" to a "data-driven service benchmark in the American cross-border e-commerce

warehousing field". It will attract more high-quality customer resources for subsequent business expansion (such as expanding service coverage and increasing service categories), and reduce market promotion costs — a mature LinkedIn account can become a "passive customer acquisition channel", reducing reliance on high-cost promotion methods (such as industry exhibitions and paid advertising) and realizing sustainable enterprise development.

5. Conclusions and Prospects

5.1 Research Conclusions

Based on the practice of AristAI's LinkedIn account, this study constructs and verifies a three-dimensional operational model of "content type - posting rhythm - data review", revealing the impact mechanism of LinkedIn data-driven operations on the exposure of low-budget AI startups. This research highlights the critical role of precise content strategy, optimized posting schedules, and continuous data review in achieving low-cost, high-precision brand exposure for AI startups. With "low cost and high precision" as the core, the model locks target needs through product scenario-oriented content, optimizes posting windows driven by data, and dynamically adjusts through the Excel + Python review system, solving the pain points of brand exposure. Empirical results show that without any advertising investment, AristAI's fan count has increased from 0 to over 5,200, the proportion of target users is 68%, and the conversion rate of product scenario-oriented content is 12%, effectively achieving precise exposure and commercial conversion. The extended application of the model in WuXpress's warehousing business further verifies its cross-industry adaptability, providing a reusable paradigm for B2B social platform operations of small and medium-sized enterprises.

5.2 Research Limitations and Future Prospects

This study has three limitations: first, the single case sample, focusing only on AristAI's single account, failing to cover AI startups of various sizes and subdivisions as well as diverse industries, resulting in limited depth in verifying the model's universality; second, the limitation of data dimensions, only analyzing core operational data over a 2-year period, lacking tracking of in-depth commercial data such as long-term cooperation conversion and revenue contribution, making it difficult to comprehensively evaluate long-term value; third, insufficient consideration of external variables, failing to systematically incorporate factors such as platform algorithm iteration, changes in competitive environment, and user behavior migration, so the model's environmental adaptability needs further testing.

Future research can be deepened from three aspects: first, expand multi-case and cross-industry verification, summarize adaptation and adjustment strategies, and improve the model's universality; second, extend the tracking cycle, enrich data dimensions, construct a multi-dimensional evaluation system, and comprehensively measure the model's value; third, strengthen dynamic monitoring and simulation experiments of external variables, quantify their impacts and establish response mechanisms (such as optimizing content modules in combination with platform trends, and strengthening differentiated keyword mining in the review system for homogenization), enhancing the model's environmental adaptability and sustainability.

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