Integrating RPA in E-Commerce Live Streaming Sales: A Case Study of YingDao RPA

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Abstract: With massive inflows of live-stream viewers, e-commerce enterprises face significant challenges in managing vast data volumes through manual labor alone. In the current landscape of accelerated information iteration, failure to promptly process critical data may expose live-streaming e-commerce businesses to financial losses or severe operational setbacks. Consequently, there exists an urgent industry demand for technological solutions capable of enhancing operational efficiency, reducing labor dependency, and refining workflow precision. Robotic Process Automation (RPA), having undergone extensive maturation over years of development, has demonstrated widespread applicability across multiple sectors, liberating substantial human resources from repetitive tasks. This raises a pivotal question: Can RPA technology effectively empower office operations in live-streaming e-commerce enterprises? This article selects YingDao RPA in China as the research object, and through analyzing specific cases of providing technology to some live streaming e-commerce enterprises, the author finds that RPA technology can replace some human resources in the process of live streaming e-commerce office work, helping live streaming e-commerce enterprises improve office efficiency, reduce costs and increase efficiency. The results of this study provide reference for the healthy development of the e-commerce live streaming industry.

1 INTRODUCTION

The proliferation of mobile internet and the accelerated advancement of 5G technology have catalyzed the exponential growth of the live-streaming e-commerce sector, which has solidified its position as a core engine of China's new consumption era (Li, 2025). To enhance operational efficiency and refine workflow precision, e-commerce enterprises are increasingly seeking digital tools to augment office operations. In response to the demand for automated workflows, a proliferation of intelligent software solutions has emerged. Among these, Robotic Process Automation (RPA)—a technology integrating automation and artificial intelligence (AI) to deploy software robots or "digital workers" for executing repetitive, rule-based business processes—has gained prominence. RPA bots operate by mimicking human-user actions through preconfigured protocols, thereby automating procedural tasks (Gao, 2020). Having evolved through iterative advancements, RPA technology has achieved widespread adoption across industries, replacing labor-intensive manual operations, liberating substantial human resources, and significantly enhancing corporate operational efficiency (Song and Li, 2022). This raises a critical inquiry: Can RPA technology deliver operational benefits to the nascent live-streaming e-commerce sector?

YingDao RPA, a flagship RPA software brand under Hangzhou Fork Intelligence Technology Co., Ltd., specializes in robotic process automation for diverse sectors including e-commerce, finance, internet services, academia, manufacturing, logistics, and telecommunications. As a leading provider serving over 10,000 enterprises, YingDao RPA holds a pivotal position within the RPA technology ecosystem. This study selects YingDao RPA as the research subject, employing empirical case analysis of its technical implementations for live-streaming e-commerce enterprises. The findings aim to provide actionable insights for stakeholders in the live-streaming e-commerce industry, demonstrating how

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RPA integration can optimize workflows, reduce operational redundancies, and foster scalable growth (YingDao, 2025).

2 THE DEVELOPMENT OF ROBOTIC PROCESS AUTOMATION TECHNOLOGY

The evolutionary trajectory of Robotic Process Automation (RPA) technology can be categorized into four distinct developmental phases.

2.1 Assistive RPA

During this initial stage, RPA functioned as an auxiliary tool to support manual operations, primarily assisting human workers in basic data entry tasks.

2.2 Non-Assistive RPA

The subsequent phase witnessed the emergence of non-assistive RPA, which aimed to achieve end-to-end automation and virtual workforce tiering. Technologies in this stage partially liberated human labor by automating rule-based, repetitive workflows.

2.3 Autonomous RPA

Advancing further, autonomous RPA integrated perceptual technologies to partially acquire external knowledge, enabling the automated processing of unstructured data within documents. This phase marked a shift toward semi-intelligent automation (Zhang and Yang, 2022).

2.4 Cognitive RPA

The current pinnacle of development lies in cognitive RPA, which represents the future direction of the technology (Ma et al., 2021). As show in Figure 1, by leveraging modern technologies such as artificial intelligence (AI), cognitive RPA transcends procedural automation, achieving the capacity to automate prolonged and intricate tasks through adaptive learning, contextual analysis, and decision-making emulation (Gao and Shi, 2024).

Figure 1: The evolutionary trajectory of RPA (Photo credit: Original).

3 CURRENT DEVELOPMENT STATUS AND CHALLENGES OF LIVE-STREAMING E-COMMERCE INDUSTRY

On October 11, 2024, the research findings of the Blue Book on High-Quality Development of the Live-Streaming E-Commerce Industry (2023–2024) (hereinafter referred to as the "Blue Book") were officially released in Shanghai, China. The Blue Book reveals a sustained increase in the user base of China's live-streaming e-commerce sector. As illustrated in Figure 2, the penetration rate of live-streaming e-commerce surged from 4.9% in 2019 to 30.4% in 2022, reaching 37.8% in 2023—a year-on-year growth of 24.3%. Meanwhile, the user scale continued its upward trajectory, reaching 597 million individuals by December 2023, accounting for 54.7% of China's total internet users and marking a 15.9% annual increase, thereby demonstrating robust and consistent growth. According to projections, the transaction volume of China's live-streaming e-commerce industry is anticipated to exceed RMB 8 trillion by 2026. These metrics collectively indicate that the live-streaming e-commerce sector will remain a pivotal driver of economic activity, sustaining its dynamic growth trajectory for the foreseeable future (China News, 2024; Anonymous, 2024).

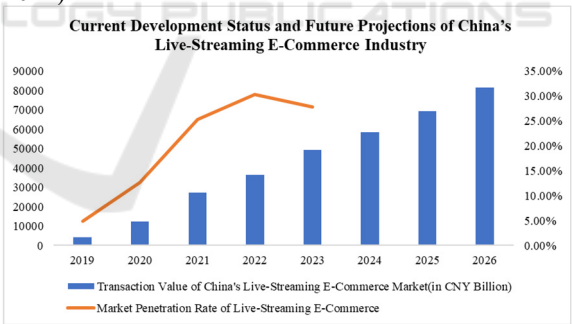

Figure 2: Current development status and future projections of china's live steaming E-commerce industry (Photo credit: Original).

With the rapid development of the e-commerce livestreaming industry, a series of challenges have emerged across its operational chain. From the supply-side perspective, e-commerce livestreaming enterprises face escalating operational costs due to the multi-platform deployment of brands and discrepancies in platform-specific regulations. During the price competition phase, disorderly pricing and malicious competition among agents have

resulted in consumer rights issues arising from discrepancies between advertised and actual transaction prices. On the demand side, the volatility of online trends creates significant obstacles in identifying trending products and formulating effective product selection strategies. The industry's nascent growth has attracted numerous entrants with limited operational experience, manifesting in two primary dilemmas: the market exhibits a polarization of talent distribution, where hosts demonstrate varying levels of expertise, while top-tier influencers command prohibitively high costs coupled with stringent requirements for Return on Investment (ROI) from livestreaming enterprises. Concurrently, enterprises grapple with the substantial challenges posed by massive order volumes during livestreaming events. These systemic issues permeate all operational phases of livestream commerce, and the absence of effective solutions has hindered the progress of numerous enterprises within this sector (He, 2024).

4 THE APPLICATION OF YINGDAO RPA IN THE E-COMMERCE LIVE

YingDao RPA implements a cloud-based centralized governance framework for automated task orchestration through the creation, administration, and monitoring of user-defined automated workflows. Equipped with autonomous real-time monitoring capabilities, the system dynamically detects operational anomalies and system events, executing predefined responses via embedded logical processing modules. Furthermore, it incorporates role-based access control mechanisms with audit trails to ensure compliance in application ecosystems. In livestream e-commerce contexts, YingDao RPA enables multidimensional automation.

4.1 Product Lifecycle Management

The system facilitates cross-platform data aggregation to monitor storefront performance and merchandise sales metrics. Enterprises can automate product listing optimizations through customizable rule engines, including dynamic information updates (titles, product imagery, inventory levels) and algorithmic management of promotional campaigns (automated enrollment, price adjustments, discount configurations). This operational paradigm significantly enhances procedural efficiency and data integrity in product stewardship.

4.2 Merchandise Selection Optimization

YingDao RPA employs public-domain platform crawlers (Kuaishou, Douyin, T-mall, Xiaohongshu) to harvest trending product metadata, subsequently transforming raw datasets into interactive data visualization dashboards via GUI-based analytics. This methodological innovation resolves the endemic challenge of cross-platform data fragmentation, empowering enterprises to refine resource allocation strategies and capitalize on emergent consumption trends through holistic market insights.

4.3 Price Governance Mechanism

The platform institutionalizes a tripartite price control protocol:

Price monitoring: Automated cross-platform price surveillance via mobile shopping interfaces.

Documentation: Algorithmic evidence preservation through price benchmarking and screenshot archiving.

Formal notification: Auto-generated pricing violation reports (structured by store identity, transaction price, timestamp) dispatched to non-compliant merchants.

This systematic approach effectively mitigates pricing discordance caused by malicious markup practices.

4.4 KOL Management Ecosystem

As the operational linchpin of livestream commerce, Key Opinion Leaders (KOLs) selection critically determines brand amplification efficacy and sales-conversion synergies. YinDao RPA constructs talent databases through native APIs or third-party analytics, automatically harvesting KOL performance metrics (e.g., Xingtu backend data) across predefined dimensions. Enterprises execute targeted KOL screening via parametric filters within unified interfaces. Additionally, the platform pioneers unmanned livestreaming solutions through RPA-driven operational takeover, achieving 72% reduction in human resource expenditures for live room management.

5 THE OPERATIONAL EFFECTIVENESS OF YINGDAO RPA IN LIVE STREAMING E-COMMERCE INDUSTRY

YinDao RPA, as a leading provider of Robotic Process Automation (RPA) solutions, addresses critical pain points in the e-commerce livestreaming industry through systematic technological interventions.

5.1 Unified Cross-Platform Data Integration Framework

Emerging livestream e-commerce enterprises face operational complexities stemming from multi-platform deployment, including fragmented data acquisition, decentralized resource allocation (e.g., advertising budgets), and labor-intensive cross-platform management. Manual processes prove inadequate for real-time synchronization given the exponential growth of daily content output (e.g., 300% YoY increase in SKU updates across major platforms).

Gongfu Biotech (Chongqing), a vertically integrated biotechnology enterprise specializing in cosmetic innovations (R&D, production, distribution), exemplifies this paradigm. By deploying YingDao RPA-driven solutions, Gongfu achieved:

(1) Algorithmic data harvesting: Automated extraction of advertising metrics, live stream analytic (viewership, user engagement), and conversion rates across platforms.

(2) End-to-end data integration: Systemic embedding of operational intelligence into business workflows.

(3) Quantifiable outcomes: The achievements are mainly reflected in three aspects. Firstly, more than 520 automated applications have been deployed; Secondly, the accumulated operating hours are over 12000; The third is to save 7800-person days of human resources.

Luo Weicai, Chief Information Officer of Gongfu Cosmetics, emphasized: "YinDao RPA has catalyzed operational metamorphosis through three strategic axes: (1) automated business intelligence acquisition and analytics, (2) procedural optimization via robotic task execution, and (3) predictive monitoring systems. This tripartite framework has generated substantial temporal and labor cost efficiencies (40% reduction in campaign management overhead), enabling strategic reallocation of resources toward core competency development and sustainable growth."

5.2 Automated Price Monitoring to Prevent Malicious Bidding

Livestream e-commerce in the beauty category has gained immense popularity among modern audiences. In January 2025, Douyin platform's GMV (Gross Merchandise Value) for this category showed a 6.37% year-on-year increase. On Taotian platform, the beauty sector achieved a total GMV of 16.394 billion yuan in January, while Kuaishou E-commerce witnessed a 58% year-on-year growth in brands exceeding 100 million-yuan sales in 2024. These figures demonstrate the robust growth momentum of beauty livestream commerce across major platforms. As a category with tremendous growth potential, the beauty sector faces increasingly severe price disruption and disorder due to numerous merchants vying for market entry.

Xiabao, a full-channel marketing service provider specializing in beauty and personal care products, manages multiple beauty brands. Wang Jiachao, Manager of Xiabao's Information Management Department, stated that beauty brands are particularly vulnerable to parallel imports and counterfeit products. Excessively low prices from unofficial channels can divert customers, damaging both brand pricing systems and distributor trust. Therefore, unified price control remains an essential task for every brand.

After implementing Yingdao RPA, as shown in the diagram, Xiabao can automatically access multiple pre-registered e-commerce platform accounts containing different product links through RPA programs. By simply proceeding to checkout immediately, the system batch-collects final consumer prices for price violation verification. Post-implementation, the RPA robots complete 3-5 daily cycles of price monitoring, each requiring only about 40 minutes - reducing the time by over 50% compared to manual operations. This replaces the previous maximum of one manual daily cycle that handled price inspections for 200 links across multiple platforms. The automated solution not only enhances efficiency, frequency, and accuracy but also enables scheduled operations, including random price checks during late-night hours when manual monitoring proves difficult. This comprehensive approach maximizes brand protection against price chaos.

5.3 Combined Deployment of Virtual and Human Hosts to Reduce Time and Operational Costs

For emerging e-commerce live streamers or enterprises lacking established audience bases, human-hosted livestreams present challenges of time consumption, high costs, and low efficiency. Unmanned livestreaming utilizing RPA virtual hosts effectively liberates human resources, enabling teams to focus on user conversion during traffic peaks.

Bai Xiao T, an IP-oriented T-shirt brand under Thumb Wardrobe (Zhejiang) Apparel Technology Co., Ltd., was established in 2019 in Ningbo, Zhejiang Province. It represents one of China's few apparel brands successfully implementing private domain strategies and new retail positioning.

By employing Yingdao RPA robots with preconfigured templates (see Table 1), the system automatically recommends products, records product explanations, and responds to viewer comments, achieving fully unmanned livestream operation. Furthermore, through Yingdao's AI Power product, the RPA robots utilize artificial intelligence search engines to directly access corporate knowledge bases, delivering query results within 1 second.

Table1: Pre-prepared forms for operation

Product ID	Top Placement Time	Top Placement Termination time
100002834556	310	560
100002834557	680	990
100002834558	1170	1395
100002834559	1585	2320
100002834560	2430	2630
100002834561	2620	3210
End	4300	3550

Through continuous optimization of its unattended live streaming system, the company Bai Xiao T has successfully liberated two personnel from repetitive tasks, enabling 24/7 cyclical broadcasting. Empirical data demonstrates that this automated solution achieves approximately 50% of the conversion effectiveness compared to human-hosted live streams, generating sales revenue ranging from 100,000 to 250,000 yuan. This technological implementation has realized optimal traffic monetization while maintaining operational costs at zero expenditure level, particularly noteworthy being its breakthrough in generating 100,000-yuan sales revenue without incremental cost investment.

6 CONCLUSIONS

By analyzing specific cases of technical cooperation between YinDao RPA and relevant live-streaming e-commerce enterprises, this paper reveals the significant application value of RPA technology in live-streaming e-commerce. Data indicates that RPA technology can assist live-streaming e-commerce enterprises in reducing costs and enhancing efficiency. In specific operational scenarios, these enterprises can effectively utilize RPA technology to replace manual operations, thereby decreasing human resource expenditure while improving office efficiency and refining work details. The author believes that in this era of rapid e-commerce development, RPA technology will gain more extensive and comprehensive applications in emerging live-streaming e-commerce enterprises and other industries, with its potential requiring continued exploration.

This study solely focuses on YinDao RPA and its cooperative enterprises as research subjects, resulting in relatively limited case selection. Moreover, the paper does not address RPA's role in other domains of live-streaming e-commerce, nor does it examine enterprises that achieved insignificant results or even experienced performance regression through RPA implementation. Future research should prioritize these aspects, incorporating analyses of different RPA technology providers and their corresponding enterprises.

REFERENCES

Anonymous. (2024). *Livestreaming E-commerce: The Development Path of Quality-Driven Livestreaming*. People's Daily,014.

China, News. (2024). *Latest Annual Report: China's live st reaming e-commerce industry is booming and undergo ing profound changes*. Retrieved from https://www.chi nanews.com.cn/cj/2024/10-11/10299803.shtml

Gao, Y. (2020). *RPA Financial Robots: Technical Features and Practical Applications*, Light and Textile Industry and Technology, 49(06), 98+103.

Gao, Y. C., & Shi, Q. (2023). *RPA in E-commerce Platforms: Application Analysis*, Straits Science and Technology and Industry, 36(06), 86-89.

He, S. Y. (2024). *Analysis of the impact of e-commerce live streaming sales on consumer behaviour*. Marketing of time-honored brands, (24), 62-64

Li, X. D. (2025). *5G-Advanced × AI: The Convergence and Collaboration Between Communication and Intelligence*, People's Posts & Telecommunications Press,003.

Ma, X. H., Zhou, Z. M., & Wang K. (2021). *RPA in Financial Shared Services Organizations: Application Research*, China Chief Accountant, (09), 39-42.

Song, H. & Li, X. (2022). *RPA Application: Challenges and Solutions*, China Collective Economy, (02), 158-159.

YingDao. (2025). Retrieved from https://www.yingdao.com/,2025

Zhang, Y. C. & Yang, Y. (2022). *RPA System in Commercial Banks: Application Research,* China Financial Computer, (02),61-65.