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Research on Decision-Making for Enterprise Live Streaming Sales Models Incorporating AI Technology

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Abstract: With the continuous development of the digital economy and breakthroughs in generative artificial intelligence, AI live streaming has become a new trend in the e-commerce field. The emergence of AI live streaming will break the high dependence of enterprises on live streamers in traditional live streaming, effectively solve the problem of operating costs, and meet the shopping needs of consumers, bringing a new live shopping experience. Therefore, how enterprises can use AI live streaming to improve economic efficiency has become an important issue. Therefore, this article takes AI live streaming as the research topic to discuss the sales model decision-making of AI enterprises.

Keywords: AI live streaming, Live streaming e-commerce, Sale model.

1. Introduction

With the accelerated evolution of the digital economy and the diversified development of consumer culture, live streaming e-commerce has rapidly emerged and has become the basic mode of online retail for enterprises after experiencing rapid growth. According to the 53rd Statistical Report on the Development of Internet in China and the Dianshubao e-commerce database, as of December 2023, the number of live broadcast e-commerce users in China has reached 597 million, an increase of 13.85% over 2022, accounting for 54.7% of the total Internet users; The market size has reached 4.9 trillion yuan, an increase of 40.48% compared to 2022, accounting for 31.87% of the online retail market size [1-2]. Live streaming e-commerce is creating an immersive shopping experience through intuitive product display and instant intimate consumer interaction, achieving precise marketing, effectively breaking the bottleneck of traditional e-commerce shopping, and opening up new growth points for enterprises.

At present, while leading business development, live streaming e-commerce has also exposed operational difficulties: firstly, the sustainability of live streaming methods is facing challenges. Store self-broadcasting and influencer agency broadcasting are currently the mainstream live streaming methods. The former increases operating costs due to lagging professional team building and weak traffic capture capabilities, while the latter leads to bargaining power transfer and profit space compression due to excessive reliance on top anchors. In recent years, there have been a few single digit deals in the live broadcast e-commerce market when brands paid millions of pit fees. For example, Yang Zi and Huang Shengyi only made one deal in the live broadcast, which profoundly reveals the benefit dilemma of the coexistence of "traffic foam" and "conversion failure" in the traditional live broadcast mode. Secondly, there is insufficient technological empowerment. In the current research and business practice on live streaming e-commerce, there is a focus on business model innovation and a neglect of in-depth exploration of underlying technical support, especially in terms of theoretical gaps in the development and application of intelligent tools. Under the dual contradiction, the live streaming e-commerce industry urgently needs to achieve cost reduction and efficiency improvement through technological innovation, as well as update its live streaming methods.

The continuous breakthroughs in artificial intelligence technology have provided a critical path for the innovation of the live streaming e-commerce industry. Technologies such as multimodal interaction enable AI systems to have humanoid capabilities, driving AI live streaming from concept verification to large-scale applications. Since 2023, JD.com has launched the "Yanxi Virtual Anchor" product and achieved a single transaction volume of over 50 million yuan in 2024 through live streaming under the image of Liu Qiangdong's "Procurement and Sales Dongge AI Digital Person"; Tiktok supports AI live broadcast and local life, culture and tourism in a certain region - theme park uses AI live broadcast to create an 11 hour GMV of 55000 yuan; L'Oreal launches Maybelline AI live streaming project to enable consumers to "shop in the cloud"; IELTS Lauder utilized Li Shuwen's AI digital persona to attend the event and live stream. These cases all confirm the significant advantages of AI technology in reducing labor costs, extending live streaming time, and improving interaction accuracy. It even reconstructs consumer scenes through technologies such as 3D display and real-time rendering, breaking through the limitations of traditional live streaming's flatness and pointing towards a new ecological live streaming with intelligent perception, dynamic response, and full-time service.

Therefore, in the development process of live streaming e-commerce, the emergence of AI live streaming will have a direct impact on the sales model of enterprises, and consumers' shopping methods will also change accordingly, leading to new research questions. This article takes enterprises that focus on online sales as the research object, with AI live streaming as the research theme, to explore the impact of AI live streaming on the decision-making of enterprise live streaming sales models.

2. Literature Review

Live streaming e-commerce is a new type of e-commerce model that combines the characteristics of online live streaming and e-commerce. It is an e-commerce channel where merchants recommend products or services in the form

of live video broadcasts through hosts, and interact with consumers in real time, ultimately achieving the goal of selling goods. Compared with traditional shelf e-commerce, live streaming e-commerce has the characteristics of real-time interaction, intuitiveness and scenarization, data-driven and precise marketing, fan effect, etc. In live streaming, the anchor displays products, explains product characteristics and usage methods in a more three-dimensional and emotional way to consumers in detail, and the anchor provides timely and detailed answers. Throughout the communication process, the information transmission between the anchor and consumers is rapid, reducing the poor shopping experience caused by information gap, which is conducive to weakening consumers' uncertainty about product information, shortening the gap between buyer shows and seller shows, increasing consumers' sense of participation and trust, and having a positive impact on consumers' purchasing decisions, thereby improving product purchase rates [3-5]. The rapid rise of live streaming e-commerce has led to numerous companies and practitioners entering the live streaming field, and based on this, more and more scholars are conducting academic research on live streaming e-commerce.

In the early days, some scholars studied whether companies should introduce live streaming channels and their conditions, such as Wang considered the increase in perceived value of live streaming for consumers and the troublesome cost of watching live streaming. They explored whether manufacturers should introduce live streaming on their existing online direct sales channels and found that whether manufacturers introduce live streaming is related to the average perceived value of their products and the magnitude of changes in perceived value [6]. Pan divided consumer shopping motivations into two categories: hedonism and utilitarianism, and constructed three channel models: traditional online channel strategy, single live streaming channel strategy, and mixed channel strategy. They studied whether brand owners introduce live streaming and found that the higher the sales level of anchors, the more manufacturers will introduce live streaming and increase revenue [7]. Based on considering the social influence and endorsement reliability of anchors, Hou studied the issue of whether brand owners introduce live streaming. They found that only when the social influence of anchors is high, brand owners will introduce live streaming, and as the endorsement reliability of anchors increases, the demand for their social influence gradually decreases [8]. Gong constructed traditional multi-channel sales strategy models (single online strategy, online and offline experience store strategy) and multi-channel sales strategy models after introducing live streaming (online and live streaming strategy, online and offline experience store and live streaming strategy) in a retail monopoly environment, and studied the conditions for online retailers to introduce live streaming channels [9]. Duan and Zhou constructed a supply chain consisting of manufacturers and electronic retailers, exploring whether electronic retailers should introduce live streaming and the choice of sales models [10]. Xu and Li established a multi-stage game model of a two-level supply chain in a system composed of a single manufacturer and an e-commerce platform, and found the conditions for manufacturers to adopt direct sales or resale models. They then studied the conditions for each party to initiate live streaming sales based on different sales models [11]. Zhang considered a supply chain system composed of manufacturers, e-commerce platforms, and live streaming suppliers, and constructed three models from the perspectives of production costs and signing fees: no live streaming, manufacturers introducing live streaming, and e-commerce platforms introducing live streaming. They studied whether manufacturers and e-commerce platforms introduce live streaming [12]. Wang considered a sales channel that includes a manufacturer and an e-commerce platform. The manufacturer sells two types of products through self-operated e-commerce platforms or official flagship stores, exploring the manufacturer's sales model choices and whether live streaming is introduced under different sales models [13]. Wang constructed a system consisting of a single online retailer and multiple offline retailers, considering the quality perception, channel price competition, and cost differences of products from different channels. They explored the decision-making problem of introducing live streaming for online retailers and found that whether online retailers introduce live streaming depends on the number of offline retailers [14]. Zhang studied whether multinational corporations should introduce live streaming channels on overseas e-commerce platforms when selling products through online retail departments and third-party electronic retailers on overseas e-commerce platforms, and the optimal online channel structure selection for multinational corporations after introducing live streaming channels. They found that the introduction of live streaming channels and their optimal channel structure depend on the interaction between channel substitutability and tax differences [15].

In recent years, the rapid development of AI technology has led the live streaming e-commerce industry to begin laying out the AI live streaming track. AI live streaming integrates advanced technologies such as deep learning, natural language processing, computer vision, speech recognition and synthesis, and big data analysis. The system can simulate the behavior of human anchors, including voice interaction, video processing, content generation, and recommendation, thus completing the entire live streaming process without the need for real-time human participation, bringing new vitality and energy to e-commerce live streaming and retail.

Early scholars lacked consistency in their definition and conceptual understanding of artificial intelligence virtual avatars. Miao determined the core elements and clear definitions of AI virtual images by constructing a comprehensive theoretical framework, and classified them into four types based on appearance realism and behavioral realism: cartoon low intelligence level images, cartoon high intelligence images, real low intelligence images, and digital human images [16]. Audrezet and Koles divided AI avatars into 2D and 3D, which were then transformed into cartoon characters, personification, realistic, and even hyper realistic appearances [17]. Based on this, some scholars have begun to conduct in-depth research on AI anchor cartoons and digital human images.

In terms of cartoon characters, Gao explored the impact of AI anchors on consumers' purchase intention in live streaming e-commerce based on the Stimulus Organism Response (SOR) framework. The study found that the affinity, responsiveness, and agility of AI anchors enhance consumers' purchase intention by enhancing their social and remote presence [18]. Hu and Ma found that due to the inability of AI anchors to personally experience products, using sensory language can make consumers realize that it violates the language expectation theory, leading to a decrease in consumer purchase intention [19]. Wu further found that the

social characteristics exhibited by AI anchors have a positive impact on consumers' experience value of live streaming [20].

In terms of digital human image, some early scholars studied the impact of AI influencers' anthropomorphic appearance on marketing endorsements. Song used a research method combining text analysis and experiments, taking spokesperson type (AI or human) as the independent variable and brand authenticity perception as the dependent variable, to explore the differential impact of spokesperson type on consumers' perception of brand authenticity. They found that brands endorsed by AI influencers were perceived by consumers to lack authenticity compared to brands endorsed by human spokespersons [21]. Sean found that consumers have lower trust in AI influencers in marketing compared to humans [22]. Um found through a questionnaire survey that consumers' perceived anthropomorphism and perceived authenticity positively affect their attitudes towards AI influencers [23]. Claudia combined experimental research and questionnaires to study the effectiveness of AI influencers in advertising. They found that consumers prefer human spokespersons, but the higher the fit between technology products and AI influencers, the more likely it is to enhance consumers' attitudes and purchase intentions towards advertising [24]. Veronica L and Kendra used a 2x2 intergroup design, with the presence or absence of misconduct and spokesperson type as independent variables, and consumer attitudes and purchase intentions towards the brand as dependent variables, to study the effects of AI influencers as brand spokespersons. They found that in the absence of misconduct, there was no significant difference in consumer attitudes and purchase intentions towards AI influencers and celebrities as spokespersons [25].

With the deepening of research, scholars have begun exploring the application of hyper-realistic digital human AI anchors in live-streaming e-commerce. Zhang building upon the Appraisal-Emotion-Action framework, discovered that consumers' perceptions of an AI anchor's coolness and congruence (the degree of similarity between the consumer's self-image and the AI anchor's image) positively influence their social interaction intentions and impulse buying intentions through the emotional states evoked during viewing [26]. Chen grounded in Social Identity Theory and Construal Level Theory, investigated how anthropomorphic design of AI anchors affects consumer acceptance. Their findings revealed that anthropomorphic design reduces the psychological distance between consumers and AI anchors, thereby enhancing trust and ultimately increasing acceptance willingness [27]. Liang demonstrated that both appearance anthropomorphism and behavioral anthropomorphism of AI anchors significantly impact consumers' purchase intention, sense of social presence, and trust [28]. Qin and Guo further examined the mechanism through which AI anchors influence consumers' purchase intention in live-streaming commerce, with particular focus on the moderating role of image realism [29].

3. The Impact of AI Live Streaming on Consumers

AI live streaming has profoundly changed consumers' shopping decision-making process through intelligent technology. The following provides a detailed analysis of the impact mechanism from three dimensions: user interaction experience, trust mechanism, and impulse consumption promotion.

3.1. User Interaction Experience

(1) AI live streaming provides real-time Q&A, improves interaction efficiency, and reduces decision-making delays. Traditional live streaming relies on manual customer service, and response speed is limited by manpower. However, AI customer service can provide real-time answers to product parameters, promotional activities, and other questions, reducing consumer waiting time. At the same time, AI can identify vague questions and provide accurate answers combined with a knowledge base, improving information acquisition efficiency. For example, Taobao Live's "AI assistant" can automatically reply to 80% of common questions, increasing conversion rates by 15%.

(2) Personalized recommendations, dynamically matching user preferences, and enhancing purchasing motivation. AI live streaming dynamically adjusts recommended content based on user stay time, interaction frequency, historical orders, and other data. At the same time, it combines contextual information such as time and geographic location to enhance recommendation relevance. For example, personalized recommendations from JD AI live streaming can increase click through rates by 30% and GMV by 20%.

3.2. Trust Mechanism

(1) The trust advantages and challenges of AI anchors. The image and language of AI anchors can be controlled to avoid emotional fluctuations or mistakes of real anchors. At the same time, some consumers believe that AI represents "cutting-edge technology" and is more persuasive for high-tech brands, such as electronic products; However, AI anchors also face challenges. Virtual anchors have weak micro expressions and empathy abilities, making it difficult to establish deep trust, such as beauty live streaming requiring real people to try and display effects, lacking emotional resonance. At the same time, the existence of the "uncanny valley effect" may cause discomfort to users due to overly realistic virtual humans, such as Meta virtual anchors being criticized for stiff eyes.

(2) The irreplaceability of live streamers. Real streamers enhance credibility through personal stories and spontaneous interactions, creating emotional connections between streamers and consumers. At the same time, the reputation endorsement of top streamers can significantly reduce users' perceived risks.

3.3. Promote Impulse Consumption

(1) Based on psychological sales strategies, AI language can be optimized to indicate certain scarcity, social proof, and dynamic pricing. For example, AI automatically generates "only 3 items left!", real-time displays "XX user just purchased" and "500 people are rushing to buy", triggers herd effect, and adjusts discount intensity based on user browsing time.

(2) Time limited recommendations and scenario based stimulation. AI live streaming can automatically insert a "flash purchase flash sale" countdown bar to shorten decision-making time and provide consumers with countdown pressure; It is also possible to recommend related products based on user profiles, such as pushing headphones and case packages after buying a mobile phone.

4. The Decision Motivation for Enterprises to Adopt AI Live Streaming

As can be seen from the third section, AI live streaming has multiple impacts on consumers. Therefore, it is profitable for enterprises to adopt AI live streaming sales models. Considering only the real operating environment, the introduction of AI live streaming by enterprises is not simply a technological upgrade, but a comprehensive decision based on multiple dimensions such as cost, competition, consumer demand, and strategic transformation. This article will conduct a detailed analysis of four core drivers: cost-benefit analysis, market competition pressure, changes in consumer demand, and digital transformation strategy.

4.1. Cost-Benefit Analysis

Traditional live streaming requires high salaries to hire professional anchors, and the commission for top anchors can even reach 20% -30% of sales revenue. However, AI anchors can live stream 7 × 24 hours a day, while reducing the cost of a single live stream; The application of AI can also replace some customer service, field control, and product selection positions. For example, JD's AI live streaming system automatically processes 80% of user inquiries, reducing the need for manual customer service and lowering team costs.

4.2. Market Competition Pressure

Driven by the continuous iteration of AI technology, leading enterprises have taken the lead in laying out the AI live streaming track. Based on the industry following effect, enterprises can build three core competitive advantages by deploying AI live streaming: firstly, achieving agile breakthroughs in market response, secondly, creating innovative experiences in content form, and finally forming a data-driven intelligent operation loop.

4.3. Changes in Consumer Demand

Under the wave of digitalization, Generation Z consumers exhibit three core characteristics: pursuing instant satisfaction, favoring entertainment experiences, and advocating personalized services. AI live streaming, with its technological advantages, perfectly meets these needs - real-time recommendation and one click purchase functions satisfy its "instant decision-making" consumption habits; The anime image of the virtual anchor (such as Luo Tianyi) and intelligent interactive play methods (such as AI bullet screen lottery) significantly enhance the fun of participation; Based on user behavior data, the personalized live streaming of "thousands of people, thousands of faces" has precisely hit the young people's desire for exclusive experiences.

4.4. Digital Transformation Strategy

AI live streaming is becoming the core engine for enterprise omnichannel integration innovation, reconstructing business value through three dimensions: at the channel integration level, relying on intelligent O2O closed-loop systems, achieving seamless connection between online traffic and offline experience; In terms of user operation, by leveraging AI driven private domain traffic pool construction, we can convert live streaming viewers into high-value members and increase repeat purchase rates; In the direction of strategic upgrading, enterprises deepen the triple transformation of live streaming scenarios, achieve business model innovation, and reshape organizational capabilities through AI technology, continuously improving the commercial value conversion efficiency of intelligent live streaming agents.

5. Summary and Implications

AI live streaming is evolving from simple tool applications to systematic business transformation. Enterprises need to establish a four in one decision-making framework of "cost competition demand digital transformation", grasp the dividends of AI live streaming technology, innovate their sales models, and stimulate market potential. However, amidst the rapid development of AI live streaming technology, we still need to be aware of the accompanying technological bottlenecks and ethical and legal challenges. These challenges are not something that a single enterprise can tackle, but require a collaborative solution framework across the industry to seek a dynamic balance between innovation and regulation. Only through a multi pronged approach can we fully unleash the commercial potential of AI live streaming, guide the industry towards a high-quality development path that combines innovation vitality and sustainable development, and ultimately achieve a win-win situation of technological empowerment and cultural prosperity.

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