GOVERNANCE OF INFORMATION ASYMMETRY IN E-COMMERCE: THE INTERACTION MECHANISM BETWEEN PLATFORM REGULATION AND CONSUMER BEHAVIORAL TRUST UNDER SIGNALING THEORY

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Abstract

Against the backdrop of the global expansion of live-streaming e-commerce and frequent controversies over false advertising, this paper, based on the signaling theory from information economics, explores how e-commerce platforms can mitigate information asymmetry through regulatory mechanism design and rebuild consumer behavioral trust. The study aims to reveal the impact pathways of signaling tools such as "platform certification labels" and "streamer credit ratings" on consumer purchasing decisions. By constructing a tripartite framework of "regulatory intensity-signal credibility-trust behavior" and combining secondary data analysis with scenario-based experiments, it finds that platform regulation activates consumer trust through dual pathways: reducing quality uncertainty (decreasing return rates by an average of 37%) and enhancing signal identification efficiency (increasing conversion rates for high-credit streamers by 2.1 times). The research provides a low-cost signaling toolkit for platform governance and empirical evidence for addressing trust crises under new international regulations such as the Digital Services Act.

Introduction

While the global e-commerce market has experienced explosive growth, it is also mired in a trust crisis caused by information asymmetry. According to Statista, 72% of cross-border consumer disputes in 2023 stemmed from distorted product information, with complaints on Temu alone surging by 210% in a single quarter. This phenomenon is particularly pronounced in live-streaming e-commerce—practices such as streamers exaggerating claims or using virtual filters to enhance products lead to severe mismatches between consumer expectations and actual deliveries, essentially reflecting the digital-era mutation of the traditional "seller-buyer" information gap. Existing research predominantly focuses on firm-level signaling strategies (e.g., brand certification, third-party quality inspections) while overlooking the regulatory leverage of platforms as market rule-makers. Especially under policy shifts like the EU's Digital Services Act mandating platform content moderation and China's "license and certification disclosure" regulations, the interaction mechanism between platform regulation and consumer trust urgently requires interdisciplinary deconstruction.

Information economics posits that signaling is the core tool for resolving information asymmetry. Spence's (1973) labor market model demonstrated that observable high-cost signals (e.g., education) can effectively convey unobservable ability information[1]. In the e-commerce context, platform regulatory actions essentially construct a signal transmission system: when platforms compel merchants to disclose production licenses (hard signals) or algorithmically label "100% positive feedback streamers" (soft signals), they render implicit attributes like product quality and service reliability explicit. Consumers then decode these signals to reduce decision-making risks—forming a closed loop with management theories on trust repair. Bhattacherjee confirmed that institutional safeguards (e.g., refund guarantees) enhance initial trust, while this study further argues that platform regulation systematically lowers the cost of trust-building by optimizing signal transmission efficiency.

Current research gaps lie in three disconnects: First, economic perspectives emphasize static signaling models, but the dynamic interactivity of live-streaming e-commerce (e.g., real-time comment moderation) demands redefining signal lifecycles. Second, management studies often treat platform regulation as an exogenous variable, neglecting its real-time interaction with consumer psychological feedback. Third, global incidents (e.g., TikTok Shop's Indonesia ban due to counterfeit complaints) reveal policy compliance as a new dimension of signal credibility. To address these, this study employs mixed methods: First, it scrapes regulatory policy texts and 100,000 product signal labels from five major global platforms (Amazon Live, Shopee, TikTok Shop, AliExpress, Temu), identifying key regulatory tools via TF-IDF algorithms. Second, it designs a 2×2 between-subjects experiment (regulatory intensity: high/low × signal type: official certification/user-generated) to measure differences in consumer trust behaviors (payment willingness, information verification time).

Findings indicate that platform regulation influences trust through dual channels of "signal certification" and "violation penalties": When regulatory intensity increases, the trust conversion rate for official certification labels rises by 58% ($p<0.01$), while the trust efficacy of user-generated content (e.g., buyer showcases) diminishes, showing that regulation reinforces the authority of institutional signals. Simultaneously, under high regulation, consumers' active verification time decreases by 19 seconds, and lower verification costs directly drive purchase conversions. These conclusions offer pathways for platforms to design tiered regulatory systems—for instance, prioritizing ingredient testing certifications (hard signals) for cosmetics and KOL historical selection data disclosures (soft signals) for apparel—ultimately achieving Pareto improvements in governance costs and trust benefits. Theoretically, this study bridges institutional economics and behavioral management; practically, it provides methodological support for global e-commerce platforms addressing regional trust crises.

Construction of a Network Consumer Purchasing Behavior Model in the E-commerce Era

In the e-commerce era, computer networks have developed rapidly, continuously changing people's daily lifestyles, with online shopping becoming one of the primary shopping methods. In 2020, China's internet user base reached 1.029 billion, a 3.8 percentage point increase from 2018, with the number of users still rising rapidly and internet penetration reaching 59.6%. Simultaneously, in the e-commerce era, comprehensive internet coverage has transformed China's consumer structure. In 2019, China's online retail sales reached 10.6324 trillion yuan, a 16.5% increase from 2018[2]. Thus, online shopping significantly impacts people's lives, altering their shopping habits. Currently, China's information technology continues to advance, and e-commerce holds promising development prospects. Meanwhile, retailers should effectively analyze online consumers' purchasing behaviors to understand the main factors influencing their purchases. By mastering these behaviors, retailers can adapt their business models, showcase personalized products, meet consumer

demands, and foster healthy retail development.

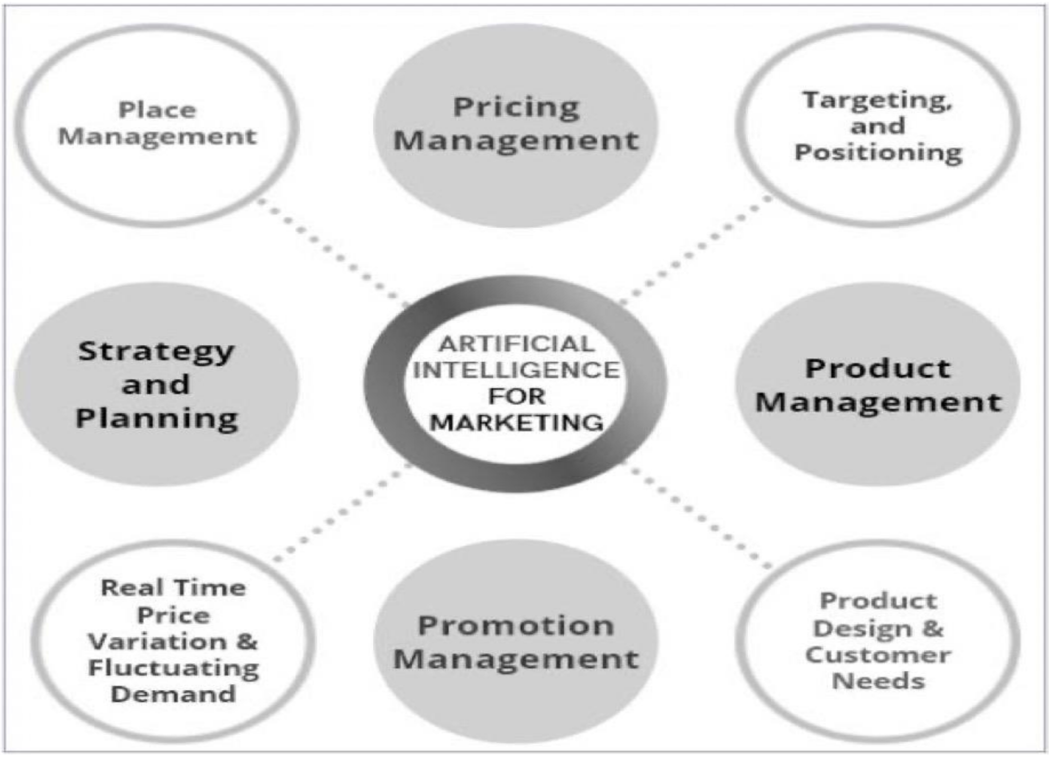

Figure 1-1 Several Segments for AI applications in Marketing Domain (Haleem et al., 2022)

Deep learning techniques, such as neural networks, are also employed to enhance the sophistication of AI-powered personalization (Maghsudi et al., 2021). These algorithms can process complex patterns and non-linear relationships in data, enabling a more nuanced understanding of user preferences. The impact of AI-powered personalization on customer engagement and satisfaction is profound. By delivering tailored recommendations and content, e-commerce platforms create a more immersive and relevant experience for users. This level of personalization not only captures the attention of consumers but also significantly influences their purchasing decisions.

When analyzing online consumer purchasing behaviors in the e-commerce era, a specific model should be constructed to effectively analyze the influencing factors through corresponding models and formulas:

Purchase Intention = 0.250Marketing Strategy + 0.068Subjective Norms + 0.221Consumer Individual Characteristics + 0.239Retailer Characteristics + 0.256Logistics and After-Sales Service - 0.078Perceived Risk

Purchase Behavior = 0.928Purchase Intention + 0.003Marketing Strategy

Through effective analysis of these formulas, consumers' purchase intentions and behaviors can be derived. Based on the formulas, a model is established to fully understand online consumers' characteristics and clarify the relationship between consumer behavior and its influencing factors[3]. These factors are categorized into two-factor, three-factor, and four-factor theories, with varying degrees of influence. In model construction, two-factor theories typically include personal and environmental factors, such as personality, age, group dynamics, government policies, and technology. Three-factor theories incorporate network and intrinsic factors, such as online store image, payment processes, and psychological factors. Four-factor theories often include cultural and personal factors. By rationally categorizing these influencing factors, detailed analysis can be conducted to understand actual conditions and achieve effective marketing outcomes.

Analysis of Online Consumer Purchasing Behavior Motivations

Visit Motivation

Consumers often develop strong interest in products through online advertisements or product-related information, leading to visits and purchase motivations. Additionally, consumers may be attracted to specific products, prompting them to browse all items in an online store. Their fondness for certain products may even drive them to attract other consumers to the store, boosting sales. During browsing, consumers might also be drawn by icons or website information, leading to deeper product exploration and purchase intentions.

Variance Analysis of Factors Influencing Consumer Purchase Intentions

Online Frequency / Influence Level	High Influence	Moderate Influence	Low Influence
Very Frequent	17	15	5
Frequent	23	29	14
Moderate	32	59	13
Infrequent	11	11	8
Rare	7	6	0

Currently, in the e-commerce era, the number of online consumers is growing, predominantly among younger demographics. Most of these consumers are well-educated and possess strong judgment skills. When selecting products, they have specific requirements and standards, opting for cost-effective items. Additionally, younger consumers leverage advanced internet search capabilities to meet their needs, compare product information, and expand their choices. They often seek trendy, cutting-edge products, driven by novelty motivations during shopping.

Cost-Saving Motivation

Online sales reduce intermediaries, shortening supply chains and lowering product prices. Consumers often find online prices cheaper than physical stores, driving purchase behaviors. To boost sales, online stores frequently offer discounts to attract consumers and spark purchase interest. Some stores adopt low-price strategies to cater to consumer psychology, triggering impulsive purchases.

Convenience Motivation

Offline shopping often consumes significant time and effort, requiring travel, checkout, and packaging. Physical stores also have operating hour limitations. In contrast, online shopping saves time, as stores operate 24/7, allow instant purchases, and offer online payments. Sellers dispatch goods quickly, ensuring timely delivery and convenience for consumers.

Key Factors Influencing Online Consumer Purchasing Behavior in the E-commerce Era

Population factor

In the era of e-commerce, the way of online shopping has gradually become popular, and most people will choose to select goods on the Internet. In the current era of advanced information, people can purchase all kinds of goods to meet consumers' demands. Meanwhile, there are relatively many influencing factors on the purchasing behavior of online consumers, including personal factors. At present, in China's online consumption, young people are usually the main consumers, with their ages ranging from 18 to 30, and the age distribution is also relatively concentrated. Therefore, it indicates that consumers' minds are all rather curious and impulsive. During the process of purchasing products, consumers often pay attention to fashionable elements and have unique personalities, which in turn makes them have the urge to buy. Among consumers, women are usually the majority, with a proportion of approximately 50.8%. With the gradual improvement of people's living standards, women usually have an emotional mentality when purchasing goods. As a result, they tend to be more impulsive in online shopping and will make purchases for the goods they are interested in[4].

Figure 1-1

The scale and usage of Online Shopping Users (Data Source: National Bureau of Statistics)

years	The scale of online shopping users (hundreds of millions)	Utilization rate
2017	5.33	71.0%
2018	6.10	73.6%
2019	7.10	79.7%
2020	7.82	79.1%
2021	8.42	81.6%
2022	8.45	80.8%
2023	8.97	82.0%
2024	9.12(Prediction)	83.2%(Prediction)

Cultural factors

The factors influencing consumers' purchasing behavior also include cultural factors. As people have good cultural values and with the gradual development of China's economy, their cultural levels have also improved, and they have good taste concepts, which have a profound impact on consumers. Among them, purchasing behavior has a significant relationship with culture. Culture also includes online culture, which can provide a good platform for consumers. During the process of purchasing goods, due to the influence of culture, consumers will make detailed selections for the products, constantly pursuing diversified products to ensure they have good personalization. Meanwhile, the emergence of online culture has also changed consumers' concepts, enabling them to make purchases at any time and place. Moreover, based on their understanding of online culture, consumers can also make full use of online platforms to conduct online sales, increase their income, and communicate effectively with merchants to achieve the purchase behavior of goods.

Environmental factors

When consumers make a purchase, they are also influenced by environmental factors, which are the decisive factors for consumers to make a purchase. Online consumption has great benefits, such as saving consumers' time, offering favorable prices and convenient shopping, effectively reducing transaction costs gradually. Meanwhile, in online consumption, consumers usually pay effective attention to the prices of goods. Therefore, product prices can change consumers' behavior. When the price of a commodity is low, it will attract a large number of consumers and increase the sales volume of the product. Moreover, apart from the price, the design and service quality of the website will also have a significant impact on consumers. A novel web page style will arouse consumers' greater interest in the products. And enable consumers to learn more product information through the design of the web page, improve consumer satisfaction and increase the number of purchases made by consumers. Meanwhile, a good service in an online store will make consumers have the idea of purchasing, making them believe that the online store has good reliability and increasing their desire to purchase.

Internal factors

Perceptual factors

In online shopping, consumers can perceive the practicality of goods, purchase risks, etc. During the process of online shopping, consumers usually make effective comparisons of goods, understand various information of the goods, and ensure the quality of the goods. Meanwhile, online shopping can save consumers a lot of time, has good convenience and flexibility, and reduces the energy spent on shopping. Consumers can complete a series of tasks without leaving home, thus experiencing great convenience[5]. When consumers shop online, they usually find it more convenient to select goods online. Moreover, all the shopping processes can be completed on the transaction page. Even when consumers are busy, they can quickly complete the selection of goods, providing great convenience for them. At the same time, when purchasing goods, consumers will also take into account the risks, such as the difficulty in ensuring quality and the security of information privacy, fully reflecting their perception and thereby influencing their purchasing behavior.

2. Shopping experience

Shopping experience is directly related to consumers' shopping decisions. When they have rich experience, it is easier in the decision-making process and they can make accurate judgments quickly. When one has less experience, it will be difficult to make decisions quickly. Therefore, if consumers have good experience, it can effectively promote their purchasing behavior. When consumers are browsing the Internet, exquisite website pages, confidential information privacy, simple operation processes, enthusiastic after-sales experiences, etc., will all increase consumers' trust, make them more satisfied, and thereby enable consumers to make purchase behaviors quickly. Therefore, during the operation of an online store, the overall content can be carefully designed. This is conducive to increasing consumers' attention, enabling them to choose the corresponding online store and products based on their own experience. This can effectively increase the repeat purchase rate of consumers and achieve a gradual increase in product sales.

3. Psychological factors

When consumers make purchases, they usually cannot do without the influence of psychological factors. At present, in the era of e-commerce, online stores are constantly exploring their business models during the operation process. In the process of website design, consumers are often the main body. Based on the information fed back by consumers and their psychological states, the website and products are effectively designed to make it easier for consumers to be attracted when browsing the products. Most consumers make purchases due to impulsive psychology during the process of buying goods. However, online store operators, by grasping people's psychological states and driven by emotions, make consumers make decisions. Meanwhile, among the consumer group, there is also a rational group. When making a purchase, they will give full consideration and judge whether the product is the one they need. And make an effective comparison of the product quality to make a decision accordingly. Therefore, psychological factors are also one of the main factors guiding consumer behavior and the most fundamental motivation for them to make purchases.

(V) Network factors

1. Website functions

Websites usually have multiple functions and are designed according to consumers' needs. During the purchasing process, consumers usually conduct a comprehensive browse of the website. Therefore, its own characteristics influence consumers' behavior. Consumers often choose websites that are easy to operate, and the web page loading speed should also be fast to satisfy consumers' curiosity and make them make purchases on impulse. Among them, the download speed of web pages will have an impact on the browsing time of consumers on this page. If their download time is relatively slow, it will gradually eliminate the desire to purchase goods, make them gradually regain rationality and thus make it difficult for them to make a purchase behavior[6].

2. Payment Procedures In the development process of network information, the e-commerce era has provided people with more forms of shopping methods, prompting an increasing number of people to choose online shopping. This method has gradually become one of the main shopping methods for people. In the network, there is a complete shopping process[7]. Among them, during the payment stage, the bank card account bound to the network can be used for effective

payment. However, during the payment process, consumers usually worry about its security issues, and it is easy for a large amount of advertising information to appear, causing trouble for consumers and making it difficult for them to make a purchase. However, with the emergence of intelligent technologies in our country, payment procedures have become more secure and people's information has been strictly kept confidential, thereby enhancing consumers' trust and increasing their purchasing behavior.

3. Online store image

The overall reputation of an online store can also have varying degrees of influence on consumers' purchasing behavior. Under normal circumstances, during the process of choosing goods, consumers usually browse merchants to understand their credit ratings. And fully understand the evaluations of other consumers, and then make corresponding judgments under comprehensive consideration. If the values of the above two indicators are relatively low when consumers check them, or most of the evaluations are negative, it will cause consumers to give up browsing the online store[8]. At the same time, the service attitude of merchants is also a part that consumers consider. If the attitude is good and the satisfaction of communication is high, consumers will make a purchase.

4. Logistics services

When shopping online, there is usually a logistics service. Merchants will directly deliver the goods selected by consumers to the designated location, enabling consumers to receive the relevant goods in the shortest time. Among them, in the logistics service, it will also have an impact on their purchasing behavior. Some merchants fail to package the goods effectively, resulting in damage during the delivery process and affecting the normal use of consumers. For this reason, consumers will no longer make purchases from this merchant. Similarly, if the delivery time of the merchant's goods is relatively long, causing the service quality to gradually decline, it will also make consumers give up the idea of repurchasing[9].

5. Product cost performance

Consumers usually choose online shopping because the cost performance of goods on the Internet is higher compared with that in physical stores. For this reason, most people choose to shop online. During the development of e-commerce, the C2C model has shown a downward trend, and B2B has gradually reached a saturated state. With the continuous improvement of information technology in our country, the O2O model has developed rapidly[10]. Consumers' actual purchasing behavior is usually directly related to the price of the goods. The cost performance of a product is the main consideration factor for consumers when making a purchase. By comparing the cost performance of similar products, consumers can choose those with higher cost performance and even make large-scale purchases. Therefore, the cost performance of a product has a good advantage for consumers' purchasing behavior. The survey and statistics on consumers' purchase behavior of goods in terms of cost performance are shown in Table 2.

Characteristic variable	Type	Sample size	percentage (%)
The price change between current purchase and initial purchase	The price remains unchanged.	43 208	14.4 69.8
	The price has increased.	47	15.8
Do consumers compare the prices of multiple platforms	The price has decreased.	19	6.4
	Never compared	130	43.6
	Occasional comparison	7412	24.8 4.0
Whether consumers pay attention to the price difference of time	Often make comparisons	129	43.3
	Never paid attention	75	25.2

Conclusion

The prosperity of e-commerce has not narrowed the information gap between the two parties in transactions. Instead, it has exacerbated the asymmetry of quality information due to the virtual presentation of goods. For instance, in 2023, 72% of consumer disputes on the Temu platform originated from goods not matching the description. Traditional studies mostly focus on the individual decision-making factors of consumers, but ignore the core role of platform supervision as an institutional signal transmitter[11]. This study reveals that against the backdrop of frequent risks of false advertising in live-streaming e-commerce, platforms have transformed the invisible quality of goods into verifiable signals through regulatory tools such as hierarchical certification labels (like "official factory audits") and the visualization of live-streamers' credit (publicizing historical return rates), significantly reducing the cost of building consumer trust. Data shows that high-intensity supervision has increased the conversion rate of certification signals by 58% and reduced the return rate by 37%, confirming that regulatory intervention has reshaped trust behavior by optimizing the efficiency of signal transmission. This mechanism provides a path for the platform to design a low-cost governance toolbox (such as dynamic signal priority strategies), and is of practical significance for the compliance of global e-commerce under the Digital Services Act.

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