

A Study on the Impact of Language Service Facilitation on Cross-border E-commerce Platforms on Trade Scale

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Abstract: *The language barrier is a core obstacle restricting cross-border e-commerce, and the facilitation of platform language services offers a new perspective for explaining the expansion of trade scale. This study explores the underlying mechanism through which language services influence trade scale, starting from their embeddedness in the trade process. The research proposes three pathways of impact. At the level of trade accessibility, interface anchoring builds initial trust, information translation enhances search efficiency, and real-time communication empowerment drives the conversion of inquiries. At the level of transaction costs, language services reduce the costs of information search and screening, bilingual interaction optimizes negotiation and decision-making, and after-sales support strengthens repurchase intention. At the level of network externalities, the connection of language nodes drives synergistic user growth, cross-lingual transactions increase market thickness, and service iteration interacts with the diversification of trade structure. The study indicates that language service facilitation is a value-creating element embedded in the platform ecosystem, and its impact demonstrates holistic and cumulative characteristics. This research provides a theoretical explanation at the mechanistic level for understanding the economic effects of language functions.*

Keywords: *Cross-border e-commerce platforms; Language service facilitation; Trade scale; Transaction cost; Network externalities; Trade accessibility*

Introduction

The development of cross-border e-commerce has gradually weakened the barrier of geographical distance; however, language differences remain a significant non-tariff barrier to trade. By embedding functions such as multilingual interfaces and real-time translation, platforms provide technical support for overcoming language barriers, and language services are gradually becoming a core element of competitiveness. Nevertheless, existing research lacks a systematic explanation of the mechanism through which language service facilitation affects trade scale. This study focuses on the mechanism of how language service facilitation influences trade scale, analyzing it from three dimensions: trade accessibility, transaction costs, and network externalities. It aims to reveal the pathways through which language services, embedded within the transaction process, drive user base accumulation, increase transaction frequency, and optimize trade structure. The research seeks to construct an analytical framework linking language services and trade scale, deepen the understanding of the functional role of language elements in the platform economy, and provide a mechanistic reference for platforms to optimize the configuration of language functions.

1. The Transformation Mechanism of Language Service Facilitation and Trade Accessibility

1.1 Platform Interface Language Anchoring and the Construction of Consumer Initial Trust

The choice of interface language on a cross-border e-commerce platform constitutes the first cognitive interface through which consumers encounter unfamiliar overseas products. When potential buyers enter the platform, the adaptability of the interface language directly affects their information processing pathways. The presentation of content in their mother tongue or a language in which they are proficient can reduce cognitive load, allowing consumers to focus their cognitive resources on product evaluation rather than language decoding. This barrier-free experience at the linguistic level

triggers consumers' initial judgment of the platform's professionalism and reliability, forming an implicit mechanism for signaling quality. The core of language anchoring lies in dissolving the inherent sense of geographical distance in cross-border transactions through a familiar symbol system, constructing a psychological representation of "accessibility" in the consumers' consciousness, thereby laying a cognitive foundation for subsequent transactional behaviors.

The localization adaptation of interface language transcends simple translation, involving a deep alignment with cultural metaphors, expression habits, and consumer psychology. By reorganizing and reconstructing linguistic elements, the platform achieves a connection with the cognitive framework of consumers in the target market, and this connection functions as a medium for trust transmission during the initial stage of a transaction. A positive correlation exists between consumers' familiarity with the interface language and their perceived transaction security. A familiar linguistic environment can reduce consumers' expectations of potential opportunistic behavior and enhance their depth of understanding regarding the platform's rules and guarantee mechanisms. The trust-building effect of language anchoring exhibits path dependence, as the positive experience formed during the initial contact often becomes the behavioral anchor for consumers to continue using the platform, thereby influencing subsequent cross-border purchasing decisions^[1].

1.2 Multilingual Translation of Product Information and Search Matching Efficiency

The process by which cross-border e-commerce platforms convert product information from the source language to the target market's language is, in essence, a cross-cultural reconstruction of product semantics. Multilingual translation involves not only the conversion of corresponding vocabulary but also the localization of product attribute descriptions, functional explanations, and usage scenarios. This precise mapping at the semantic level determines whether a product can be effectively received by the cognitive schema of target consumers. When product information can be accurately conveyed to potential buyers of different languages, the visibility of the product expands within the search network, and the information silos previously constrained by language barriers are gradually broken down. The existence of multilingual information allows products to enter a broader user search horizon, thereby improving the efficiency of information flow between supply and demand.

The improvement in search matching efficiency stems from the expansion of keyword coverage and the enhancement of semantic relevance facilitated by language translation. When consumers search using keywords in their native language, the multilingual translation system can correlate and match their search intent with the translated product information at a semantic level, thereby overcoming the limitations of literal keyword matching in a single-language environment. This search matching mechanism, grounded in semantic understanding, reduces the number of trials and errors consumers need during the information filtering process, allowing products that meet their needs to appear more accurately in prominent positions within search results. This improvement in search matching efficiency directly shortens the decision-making pathway for consumers from information acquisition to product selection, reduces the time invested in the information search phase, and enhances both the rate of product exposure and the accuracy of selection per unit of time.

1.3 Language Empowerment of Real-time Communication Tools and the Inquiry Conversion Rate

Real-time communication tools embedded in cross-border e-commerce platforms have reshaped the interaction patterns between buyers and sellers across borders by integrating machine translation and bilingual interaction functions. Language empowerment allows both parties to exchange information in their respective familiar languages, thereby eliminating information distortion and communication breakdowns traditionally caused by language barriers in cross-border communication. The smooth flow of real-time communication provides consumers with a channel to obtain immediate details about products, logistics information, and after-sales service commitments. This immediacy of information access effectively alleviates the information asymmetry prevalent in cross-border transactions. When consumers' inquiries can be answered clearly within a short time, their perceived uncertainty regarding the transaction diminishes, and their willingness to purchase is subsequently strengthened^[2].

The increase in the inquiry conversion rate is rooted in the depth of communication and relational stickiness fostered by language empowerment. Consumers often require multiple rounds of information confirmation and detailed negotiation before making a purchase decision. Language assistance features enable these communication steps to be completed efficiently in a relatively short time, reducing transaction interruptions caused by poor communication. The bilingual dialogue established between

buyers and sellers through real-time tools gradually builds transactional rapport and a foundation of mutual trust through repeated interactions. This transactional relationship, predicated on linguistic interoperability, possesses considerable stability and can withstand external shocks such as price fluctuations and logistics delays. The communication mechanism enabled by language empowerment not only facilitates the completion of a single transaction but also cultivates in consumers an expectation of reliable after-sales communication. This expectation positively encourages repeat purchasing behavior and indirectly contributes to the cumulative growth of the platform's overall trade scale.

2. The Reduction Effect of Language Service Facilitation on Cross-border Transaction Costs

2.1 The Dissolution of Information Search and Screening Costs from a Linguistic Dimension

The language service functions of cross-border e-commerce platforms significantly compress the information search path for consumers in cross-border shopping by semantically reconstructing and precisely presenting product information. When consumers face product pages presented in a non-native language, language barriers often lead to a decrease in the efficiency of information retrieval, requiring consumers to expend additional cognitive resources on semantic decoding—a process that prolongs the time needed to acquire each unit of information. The multilingual translation services provided by the platform convert product attributes, specifications, and usage instructions into expressions that are easily understood by consumers, thereby streamlining the path of information retrieval and enabling consumers to grasp the basic information of a product within a relatively short time. The reduction in search costs manifests as consumers being able to browse more product pages within a limited time window, and the expansion of information exposure provides a more sufficient material basis for subsequent screening and comparison.

The cost reduction in the information screening phase is manifested as the enhancement of product quality signals and the filtering of noisy information through language services. The uncertainty consumers face in cross-border shopping primarily stems from the lack of intuitive judgment criteria for the degree of match between the actual quality of a product and its description, with language barriers further amplifying this uncertainty. Through precise semantic translation and localized expression, the platform enables quality-related information within product descriptions to be accurately conveyed to consumers, thereby reducing erroneous judgments caused by linguistic misinterpretation. During the screening process, consumers are not required to allocate cognitive resources to the verification of language decoding and can instead focus their attention on assessing the product's inherent quality attributes and their alignment with their needs. The improvement in screening efficiency directly manifests as an increase in the volume of effective information processing that can be completed per unit of decision-making time.

2.2 Optimization of Negotiation and Decision-Making Costs through Bilingual Interaction

Language assistance functions in real-time communication tools have reshaped the pattern of information exchange between parties in cross-border transactions, effectively controlling information loss during the negotiation process. In traditional cross-border transaction scenarios, buyers and sellers are often unable to communicate fully on key matters such as product details, logistics arrangements, and payment methods due to language differences, making it difficult to reach an agreement on transaction terms. Bilingual interaction technology, through instant translation and semantic restoration, enables both parties to complete multiple rounds of information confirmation in their respective familiar languages, thereby ensuring the continuity and integrity of communication. The smooth progress of the negotiation process implies a reduction in the number of information exchanges and the time cycle required to reach a transaction, consequently decreasing the communication investment needed per unit of transaction^[3].

The optimization of decision-making costs stems from the resolution of information uncertainty and the clarification of transaction expectations through bilingual interaction. During the cross-border purchase decision process, consumers often face multi-dimensional uncertainties related to product quality, logistics timeliness, and after-sales guarantees, which are amplified by language barriers and form decision-making resistance. Real-time communication empowered by language provides consumers with a channel for direct dialogue with sellers, enabling them to obtain confirmation of product details, negotiation on logistics arrangements, and explanations of after-sales terms through

immediate feedback. This information gradually clarifies the initially ambiguous transaction expectations. The reduction in decision-making costs is reflected in the shortened time interval between the completion of information gathering and the finalization of a purchase decision; the compression of the hesitation period directly enhances the efficiency of converting inquiries into actual transactions.

2.3 Language Support in After-Sales Service and Repeat Purchase Intention

The language service functions in the after-sales stage have a critical impact on the completeness of consumers' cross-border shopping experience, directly influencing their overall evaluation of the platform and subsequent behavioral tendencies. In cross-border transactions, after-sales matters such as return and exchange processes, quality complaints, and repair inquiries often involve complex communication and coordination. The presence of language barriers may lead to information misinterpretation or unclear expression during the after-sales phase for consumers, consequently forming a negative experience. The language support services embedded by the platform in after-sales communication channels enable consumers to accurately articulate their concerns and clearly understand the resolution plans proposed by the platform and sellers. As a result, the processing cycle for after-sales matters is shortened, and the completeness and timeliness of problem resolution are enhanced.

The formation and accumulation of repeat purchase intention represent a comprehensive feedback from consumers on their platform service experience, with after-sales language support playing a subtle yet persistent mechanism of action within this process. Throughout a complete cross-border shopping journey — from information search and transaction completion to after-sales service — consumers undergo multiple rounds of linguistic interaction with the platform and sellers. The smoothness of communication during the after-sales phase often becomes the final experiential fragment retained in consumers' memory. When consumers experience the dissolution of language barriers and the convenience of communication during the resolution of after-sales issues, their sense of trust and reliance on the platform is strengthened. This positive experience subsequently translates into a tendency to prioritize this platform for future cross-border purchases. Repeat purchasing behavior implies an extension of the consumer lifecycle and an increase in customer lifetime value, and this effect accumulates at the platform level, contributing to the continuous growth of trade scale and the stable expansion of the user base.

3. The Network Externalities of Language Service Facilitation and the Expansion of Trade Scale

3.1 The Connection of Language Nodes and the Synergistic Growth of the Two-Sided Market User Base

The language service functions of cross-border e-commerce platforms construct a network node system covering multilingual regions by providing access to communities of different languages, and the formation of this system promotes the simultaneous expansion of the platform's two-sided user base. Each newly added language service node signifies that the platform can reach a user group previously difficult to access due to language barriers, and potential consumers within this group now possess the basic conditions for participating in cross-border shopping after the elimination of language obstacles. Simultaneously, sellers on the supply side also benefit from the expansion of language nodes, as the enhancement of multilingual service capabilities enables them to transmit product information to a broader consumer base, and the increase in sales opportunities attracts more sellers to join the platform. The connection effect of language nodes exhibits a bidirectional characteristic, where the growth on the consumer side and the supply side mutually reinforce each other, forming a synergistic mechanism for user base expansion.

The growth of the two-sided user base, building upon the connection of language nodes, exhibits a self-reinforcing evolutionary path. When a platform accesses a new language community through its language services, consumers within that community can transact with existing sellers on the platform, and the increase in transaction opportunities attracts more consumers with the same language background to join. Simultaneously, the emergence of a new consumer group provides sellers with an entry channel to a differentiated market, and the growth in the number of sellers, in turn, enriches the range of available product categories and countries of origin. Language nodes serve not only as channels for information transmission but also as connecting media for establishing transactional relationships between users. An increase in the number of nodes implies exponential growth in

potential transaction combinations, and this network effect drives the continuous accumulation of the platform's user scale amidst the ongoing enhancement of language services^[4].

3.2 The Increased Density of Cross-lingual Transactions and the Enhancement of Market Thickness

The enhancing effect of language service facilitation on the density of cross-lingual transactions is manifested as a growth trend in the number of successfully matched transactions between users of different language backgrounds per unit of time. On cross-border platforms lacking language support, transaction pairings are often confined to users of the same language, with language differences acting as a primary obstacle to deal completion. Following the platform's introduction of multilingual translation and communication assistance functions, the transaction pools previously segmented by language barriers are gradually interconnected. Consumers can browse products from different regions across linguistic boundaries, and sellers' target markets expand from a single language group to multilingual communities. The expansion of transaction pairings directly manifests as a more complex transaction network and an increased frequency of transactions, with the number of transactions generated per unit user showing an upward trend.

The increase in transaction density leads to a structural enhancement of the platform's market thickness, which reflects the total volume of matchable transaction opportunities and the smoothness of transaction completion within the market per unit of time. As cross-lingual transactions become the norm, the liquidity of goods on the platform intensifies, with a single product being presented simultaneously to consumers across multiple language markets, and consumer demand being matched with supply resources from a broader geographical scope. The increase in market thickness brings about an optimization of the price discovery mechanism and an improvement in transaction matching efficiency, enabling buyers and sellers in a thicker market to find counterparties meeting their respective expectations more quickly, with the time cycle and search effort required for matching showing a declining trend. The accumulation of market thickness, in turn, enhances the platform's ability to absorb user stickiness; the increase in transaction opportunities prolongs the duration buyers and sellers spend on the platform and raises their frequency of participation in transactions, forming a positive cycle between market thickness and trading activity.

3.3 The Interactive Relationship between Language Service Iteration and the Diversification of Trade Structure

The technological iteration and functional enhancement of language services on cross-border e-commerce platforms continuously reshape the trade structure they support. Evolving from initial simple word-for-word translation into a comprehensive functional system encompassing semantic understanding, cultural adaptation, and multimodal interaction, this evolutionary process enables the platform to accommodate an expanding range of product categories and trade forms. Early language services were limited to the translation of standardized product descriptions; however, with the improvement of service capabilities, platforms have begun to handle customized products involving complex descriptions, service-based products requiring in-depth communication, and culturally distinctive products relying on precise expression. The expansion of language service coverage gradually integrates trade types previously constrained by language barriers into the platform's transaction system, thereby initiating the trend toward diversification in trade structure^[5].

The diversification of trade structure generates higher-level demands for language services, thereby forming an interactive evolutionary mechanism between the two. As more product types and trade forms from diverse cultural backgrounds emerge on the platform, the adaptive pressure on existing language service functions increases, necessitating the development of more targeted semantic conversion models and communication assistance tools to meet the expressive needs of new transaction types. This iteration of language services, driven by changes in trade structure, continuously refines and specializes the platform's linguistic functions. The ongoing enhancement of language services, in turn, creates conditions for even more diversified trade types to enter the platform, establishing a synergistic enhancement path between trade structure and language service functions. The interactive relationship between the diversification of trade structure and the iteration of language services ultimately manifests as the platform's capacity to support a growing trade scale in terms of total volume, while its internal composition simultaneously exhibits increasingly rich hierarchical and diverse characteristics.

Conclusion

The impact of language service facilitation on cross-border e-commerce platforms on trade scale presents a transmission pathway that extends from the front end to the back end and progresses from single instances to cumulative effects. At the front end of transactions, language services — through interface anchoring, information translation, and real-time communication — construct contact-trust and search-inquiry conversion channels, thereby enhancing trade accessibility. At the intermediate stage of transactions, language services reduce costs related to information search, negotiation and decision-making, and after-sales processes, improving per-transaction efficiency and the completeness of the consumer experience. At the back end of transactions, network externalities emerge: the connection of language nodes drives synergistic growth of the two-sided user base, increased cross-lingual transaction density leads to greater market thickness, and service iteration interacts with the diversification of trade structure. These three pathways are interwoven, endowing the impact of language services with cumulative and dynamic characteristics. Future research can expand to analyze new language functions such as voice recognition and multimodal interaction; examine the heterogeneous effects of language services on different product categories and trade models; and focus on the co-evolution of language technology and platform business models.

References

- [1] Niu, Y., & Li, C. (2025). *Exploration on the Training Model of Language Service Talents for Cross-border E-commerce in Higher Vocational Colleges under the Background of Hainan Free Trade Port*. *Journal of Hubei Open Vocational College*, 38(24), 79-81.
- [2] Wen, H., & Li, L. (2025). *Research on the Application of Artificial Intelligence in Translation on Cross-border E-commerce Platforms in the Digital Economy Era: A Case Study of Alibaba International Station*. *Management & Technology of SME*, (12), 123-125.
- [3] Zhang, Y., & Ma, G. (2024). *A Study on the Training Model of Language Service Talents for Cross-border E-commerce under the Belt and Road Initiative*. *Journal of Xi'an International Studies University*, 32(04), 86-90.
- [4] Wang, J. (2021). *A Study on the Influence Mechanism of Language Distance on Cross-border E-commerce and Its Countermeasures (MA thesis)*. Anhui University of Science and Technology.
- [5] Liu, Y. (2021). *Applied Research on Language Translation Services of Cross-border E-commerce Platforms*. *Journal of Liaoning Economy Vocational Technical College & Journal of Liaoning Economic Management Cadre Institute*, (01), 60-62.