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ABSTRACT

This study analyzes the innovation models adopted by fabric export enterprises, exploring their role in international market expansion, competitiveness enhancement, brand recognition, and supply chain efficiency. Through empirical analysis, it provides theoretical support and practical guidance for fabric exporters. A multi-method research design is applied, including case studies, questionnaire surveys, data analysis, and literature review. First, representative enterprises were selected for case studies to examine the impact of cross-border e-commerce platforms, digital supply chains, and green supply chains. Second, a questionnaire survey of 100 fabric exporters was conducted to assess the adoption and effectiveness of these models in international market expansion. Lastly, quantitative analysis was used to identify trade trends, and existing research findings were summarized. The results show that innovation models significantly enhance market expansion and competitiveness. Cross-border e-commerce enables SMEs to enter international markets quickly and achieve precise marketing; digital supply chain management improves flexibility, and efficiency, and reduces costs; while green supply chains help companies succeed in markets with higher environmental standards. These innovations not only increase market share but also enhance brand influence. However, challenges remain in terms of capital, technology, and cross-cultural communication. Future research should expand the sample scope, explore regional and enterprise-specific applications, and analyze underlying mechanisms. Overall, fabric exporters must continuously adapt to global market changes and refine innovation models to secure sustainable competitive advantages in the international market.

KEYWORDS

fabric export, innovative model, international market

INTRODUCTION

With the acceleration of globalization, international trade has become increasingly prominent in the world economy [1]. In this context, fabrics, as an indispensable and important part of the textile industry chain, its export trade is not only directly related to the growth of the national economy, but also occupies an important position in the global supply chain [2]. However, the traditional fabric export mode has been difficult to adapt to the increasingly complex demand and competitive situation of the current international market. To stand out in the international market, exploring innovative export trade models has become an urgent problem for industry insiders and scholars. In recent years, with the rapid development of science and technology, especially the application of information

technology and big data, innovative modes of fabric export trade have gradually surfaced [3]. These emerging modes not only enhance supply chain efficiency but also effectively promote the development of international markets. For example, cross-border trade based on e-commerce platforms, forecasting market demand through big data analysis, and digitization of supply chain management all provide more business opportunities and challenges for fabric exporters [4]. Meanwhile, changes in the global trade environment, adjustments in international policies, and diversification of consumer preferences have brought great impetus to the innovation of fabric export trade [5]. The purpose of this paper is to discuss the innovation mode of fabric export trade and its application in international market development, aiming at providing fabric enterprises with new perspectives and helping them to achieve competitive advantages in the international market [6]. By analyzing the current situation of fabric export trade and combining the changes in the demand of the international market, this paper will focus on analyzing the implementation path of the innovation model and its practical impact on the expansion of the international market.

The structure of this paper is organized as follows: This paper begins with a review of both domestic and international literature on fabric export trade, innovation models, and international market development. It establishes a theoretical framework and summarizes the practical experiences from existing research to support the innovations and identify research gaps for this study. The section on "Research Methodology" details the research design and methods used, including case studies, questionnaire surveys, data analysis, and literature analysis. These methods enable a comprehensive analysis of the actual conditions and effects of innovation models implemented by fabric export enterprises. The "Results and Discussion" section presents the specific outcomes and challenges that fabric exporters encounter when applying innovation models like cross-border e-commerce platforms, digital supply chains, and green supply chains. The concluding section summarizes the main findings, highlights the limitations, and suggests directions for future research. To systematically analyze the interplay between innovative models and international market performance in fabric export trade, this study adopts the Dynamic Capabilities Theory (Teece, 1997) as a unifying framework. This theory posits that firms achieve sustained competitive advantage by reconfiguring resources and capabilities to adapt to evolving market conditions. Within this framework, digital supply chain management exemplifies a sensing capability, enabling real-time data analytics to optimize production planning and logistics efficiency; cross-border e-commerce platforms represent a seizing capability, leveraging digital interfaces to penetrate new markets and tailor marketing strategies; while green supply chains embody a transforming capability, aligning operations with global sustainability standards to enhance brand recognition and meet stringent environmental demands. By integrating these three dimensions—market expansion (via seizing), supply chain efficiency (via sensing), and brand cognition (via transforming)—the framework establishes a cohesive pathway through which innovation models

collectively drive international competitiveness. This approach not only contextualizes each model's unique contributions but also underscores their synergistic role in addressing the complexities of global trade, thereby bridging the theoretical gap between fragmented innovation practices and holistic market exploitation strategies.

RESEARCH REVIEW

Driven by globalization and scientific and technological progress, the mode of fabric export trade has experienced a profound transformation from traditional ways to innovative forms [7]. In recent years, scholars' research on the innovative mode of fabric export trade has focused on several directions, including the emerging digital trade mode, supply chain optimization, and cross-border cooperation[8]. In the following, these studies will be summarized to provide a theoretical basis and reference for the research of this paper.

Traditional models and challenges of export trade in fabrics

The traditional fabric export model relies heavily on direct links between trade intermediaries, agents, and exporters. Under this model, fabric manufacturers usually sell their products to the international market through agents and wholesalers [9]. However, this mode has problems such as information asymmetry, high transaction cost, and slow response speed, which makes it difficult to adapt to the current rapidly changing international market demand [10]. In addition, with the gradual reduction of international trade barriers and the increasing complexity of the global supply chain, fabric enterprises are facing increasing competitive pressure [11]. How to improve trade efficiency, reduce costs, and open up new markets has become the main bottleneck under the traditional mode.

Innovative models of export trade in fabrics

With the advancement of science and technology and changes in the market environment, innovation models driven by information technology have gradually emerged in the fabric export trade [12]. The following are several major innovation modes:

Cross-border e-commerce platform model

In recent years, cross-border e-commerce platforms have become an important channel for fabric export trade. Through platforms such as Alibaba, Amazon, and eBay, fabric producers can directly face international consumers, which reduces intermediary costs and improves transaction efficiency [13]. Research shows that cross-border e-commerce not only opens up international markets for SMEs but also helps enterprises pinpoint their target customer groups through big data analysis.

Digital Supply Chain Management

Digital supply chain management optimizes the production, inventory, and transportation of fabric exports by leveraging the Internet of Things (IoT), big data analytics, and artificial intelligence (AI) technologies. Enterprises can monitor inventory and demand changes in real time, adjust production plans promptly, and reduce inventory backlogs and logistics costs [14]. Certain studies have shown that digital supply chain management can significantly improve the competitiveness of fabric exporters, especially in response to changes in international market demand [15]. Table 1 demonstrates the effectiveness of digital supply chain management in the fabric export trade and compares the shortcomings of the traditional supply chain model. From inventory management to market demand adaptation, digital supply chain management significantly optimizes the efficiency of each link.

Table 1. Comparison of the effectiveness of digital supply chain management in fabric exports

Field of application	Effectiveness of traditional supply chain model	Digital Supply Chain Model Effectiveness	Improved effectiveness
Inventory management	Manual records vs. cycle counts, higher inventory backlog rate	Real-time inventory monitoring, automated replenishment system	30% reduction in inventory backlog rate and 50% increase in inventory turnover rate
Production plan	Production planning is dependent on historical data and adjustments are lagging	Adjust production schedules based on real-time data for greater flexibility	40% reduction in production adjustment time and a 25% increase in efficiency of plan execution
Logistics Dispatch	Dispersed logistics information and low transportation efficiency	Intelligent dispatching system optimizes routes and tracks transportation status in real-time	15-20% reduction in transportation costs and 30% reduction in delivery time
Cost control	Operational cost control is largely dependent on economies of scale	Data-driven optimization analysis reduces waste and duplication of inputs	Reduced operating costs by about 18% and significant efficiency gains
Supply Chain Collaboration	Serious information silos and inefficient supply chain collaboration	Upstream and downstream information sharing in the supply chain for smoother collaboration	35% increase in collaboration efficiency and 50% reduction in response time to unexpected demands
Adaptability to market needs	Difficulty in responding promptly to fluctuations in market demand	Real-time monitoring of demand changes and rapid adjustment of supply chain strategies	Increased market demand response speed by more than 40% and increased order fulfillment rate

Green Supply Chain and Sustainable Development

With the increasing awareness of environmental protection and the rising demand for green products in the international market, fabric exporters are paying more and more attention to the construction of a green supply chain. A green supply chain not only requires that the environmental impact of the production process be minimized but also that the products themselves meet environmental standards [16]. Studies have shown that enterprises adopting green supply chain management can improve their brand image and develop markets with higher environmental requirements, such as Europe and the United States. Figure 1 is a framework diagram of the impact of a green supply chain on fabric exports, showing the whole process from production to logistics to market access. At the production stage, companies can achieve green production by adopting eco-friendly production technologies, reducing carbon emissions, improving resource efficiency, and reducing energy consumption for transportation [17]. In the logistics and distribution stage, optimizing logistics routes, adopting green material procurement, and meeting international environmental standards further reduce the environmental impact of the supply chain [18]. At the same time, the green supply chain can meet the demand for green products in markets such as the EU and the U.S., helping enterprises enter high-standard markets. In addition, through waste recycling and reuse, the enterprise not only reduces costs and increases profits, but also enhances its brand reputation and realizes the goal of sustainable development.

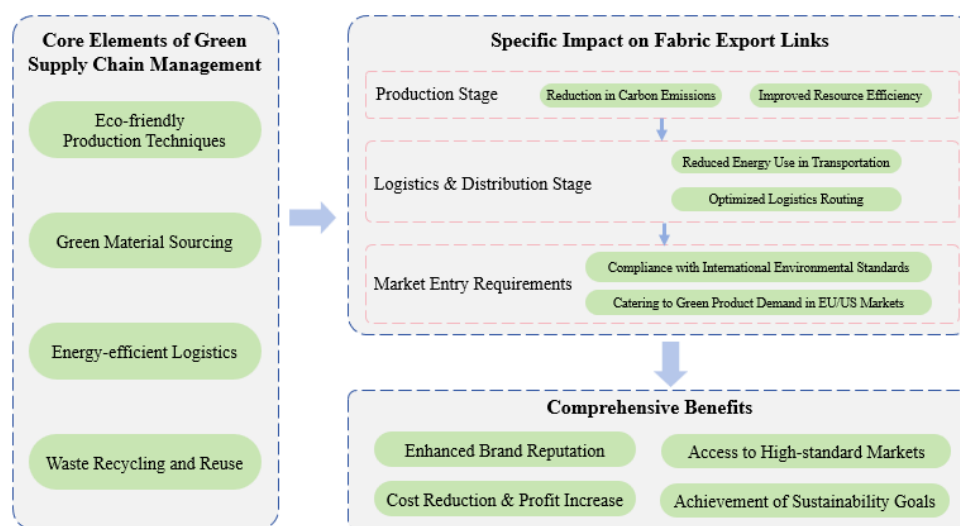


Figure 1. Framework diagram of the impact of green supply chains on fabric exports

Big Data and Precision Marketing

Utilizing big data analytics, fabric exporters can gain a deeper understanding of the changing needs of the international market, predict future trends, and position themselves accurately in the market. By analyzing consumer buying behaviour, market dynamics, and competitors' strategies, fabric exporters

can adjust their products and marketing strategies more flexibly [19]. This data-driven decision-making approach significantly improves the success rate of fabric exports. Table 2 demonstrates the specific application of big data analytics in fabric export trade and the improvement in performance compared to the traditional model. From market demand forecasting to consumer behaviour analysis, big data significantly improves the accuracy and efficiency of forecasting.

Table 2. Effectiveness of big data analytics in fabric exports

Application Areas	Traditional model effect	Big Data Analytics Model Effectiveness	Improved effectiveness
Market Demand Forecast	Relying on historical data and experience, forecasts are not precise enough	Prediction accuracy increased to 85% based on real-time data analysis	25-30% improvement in prediction accuracy
Consumer Behavior Analysis	Data collection is decentralized, making it difficult to form a clear picture of consumption	Pinpointing target customers through big data integration and analysis	40% reduction in customer targeting time and 20% increase in target customer coverage
Product Pricing	Single pricing strategy, difficult to adjust quickly	Dynamic pricing system combines market and competitive data	Increase profit margins by 5-10% to enhance market competitiveness
Marketing Strategy Optimization	Lack of targeting and limited effectiveness of marketing campaigns	Precise placement of advertisements and promotions	Reduce marketing costs by 15% and increase marketing effectiveness by more than 30
Chain management	Insufficient data sharing and slow supply chain response	Data-driven intelligent supply chain management	25% faster response time and 20-30% reduction in inventory backlogs
Competitor Analysis	Limited data sources and lagging analysis	Dynamically adjust strategies through competitor data monitoring	50% reduction in strategy adjustment time and increased market resilience

Paths to international market exploitation in fabric export trade

International market development is a key link in the export trade of fabrics. With the intensification of market competition, many studies have begun to focus on how fabric enterprises can better enter and expand international markets through innovative export modes [20]. Research shows that fabric export enterprises can develop international markets through the following paths. First, market segmentation and differentiated competition; second, cross-cultural marketing and brand building. Third, internationalization cooperation and strategic alliance.

Research gaps and challenges

Although existing studies have made preliminary discussions on the innovative mode of fabric export trade and the path of international market development, there are still certain research gaps. Firstly, most of the existing research focuses on the case analysis of individual enterprises or industries and lacks systematic research on the overall industrial chain of fabric export [21]. Secondly, the intrinsic connection between innovation mode and market development still needs to be explored in depth, especially in different regions and different market environments, the adaptability and implementation effect of the innovation mode have not been fully verified. This study addresses these gaps by integrating Dynamic Capabilities Theory to map how digitalization (sensing), e-commerce (seizing), and sustainability (transforming) synergize across diverse regions. Through multi-method analysis of cross-regional cases and survey data, it unveils context-specific mechanisms (e.g., localized digital adoption barriers, green branding nuances) and establishes a unified framework for innovation-driven market exploitation, thereby bridging theoretical fragmentation and empirical oversights in global fabric trade literature.

RESEARCH METHOD

To deeply explore the innovative mode of fabric export trade and its application in international market development, this study combines two research methods: quantitative analysis and qualitative analysis. Specifically, this paper adopts the case study method, questionnaire survey method, data analysis method, and literature analysis method [22]. The combination of these methods helps to deeply analyze the implementation path and effect of the fabric export trade innovation model from different perspectives and explore its impact on international market development [23]. The specific implementation steps of each research method and its application scenarios are described in detail below. The three innovation models—cross-border e-commerce, digital supply chains, and green supply chains—are selected for their alignment with global trends, policy shifts, and enterprise needs. Cross-border e-commerce aligns with digital trade ecosystems (e.g., China's "Digital Silk Road") and SME demands for low-cost market entry. Digital supply chains, driven by IoT/AI, address textile industry agility needs, while green chains respond to regulations (e.g., EU Circular Economy) and sustainability trends. These models synergize: digital chains optimize e-commerce via real-time data (e.g., inventory alignment), green practices enhance brand equity in eco-markets, and e-commerce platforms guide adaptive supply chain adjustments. Their interplay—operational efficiency (digital), market access (e-commerce), and sustainability (green)—forms a cohesive ecosystem, addressing cost, scalability, and compliance challenges. Pilot studies validate hybrid benefits, such as reduced lead times and improved regulatory compliance.

Case study approach

The case study method is one of the core methods in this study, aiming to reveal the advantages and challenges of the innovation model in practical application by analyzing the actual operation of several representative fabric exporting enterprises [24]. The criteria for case selection mainly include: the market scale of the enterprise, the application of the innovation model, and its performance in international market development. Through an in-depth analysis of the specific practices of these enterprises, this paper can explore the adaptability of the innovation model and its effects in different contexts. The five case firms were selected based on three criteria: geographical diversity (Asia, Europe, Americas), enterprise-scale (SMEs to large corporations), and innovation adoption level (high, moderate, low). This stratification ensures representation across varied market dynamics and operational capacities. For instance, two high-adoption SMEs in Asia demonstrated rapid market penetration through integrated digital e-commerce strategies, while a large European firm with moderate green chain implementation achieved steady growth via regulatory compliance. Conversely, a low-adoption American SME faced scalability issues due to fragmented innovation efforts, and a high-adoption African enterprise struggled with infrastructural gaps despite advanced digital tools. These contrasts highlight that success hinges not merely on innovation adoption but on aligning capabilities (e.g., resource allocation, regional infrastructure) with strategic integration of models. The inclusion of both successful and struggling cases underscores the contextual dependencies of innovation efficacy, offering nuanced insights into barriers like capital constraints and cross-regional policy mismatches.

Case firm selection and analytical framework

In this study, five representative fabric exporters from different market regions, including Asia, Europe, and the Americas, are selected as case studies. These enterprises have their characteristics in implementing innovative models, covering a variety of innovative models such as cross-border e-commerce platform applications, digital supply chain management, and green supply chain practices. The case analysis employed a grounded theory approach, utilizing open coding to extract critical variables (e.g., technological investment, cultural adaptability) from raw data, followed by axial coding to establish relationships between innovation adoption and market outcomes. For instance, recurring themes like "real-time data utilization" (linked to digital chains) and "localized sustainability narratives" (tied to green chains) were categorized and mapped to dynamic capabilities. To enhance reliability, triangulation was rigorously applied: interview transcripts from managers (e.g., challenges in AI integration) were cross-verified with internal documents (e.g., digitization budgets) and quantitative metrics (e.g., export growth rates). Discrepancies, such as overstated green claims in interviews versus actual compliance gaps in audit reports, were resolved through iterative refinement. This method

revealed nuanced interdependencies—e.g., high-tech investments in digital chains faltered in regions with low IoT infrastructure, while cultural adaptability moderated the effectiveness of e-commerce localization. By embedding theoretical rigour and multi-source validation, the framework transcends descriptive case narratives, offering a replicable model for analyzing innovation scalability across heterogeneous contexts. In the case study framework, a grounded theory approach was adopted to enhance theoretical rigour. Open coding was applied to interview transcripts, annual reports, and internal documents, identifying key variables such as technological investment, cultural adaptability, and market responsiveness. These variables were further refined through axial coding to establish relationships between innovation models and international market performance. To ensure reliability, triangulation was employed by cross-verifying data from multiple sources: in-depth interviews with senior managers, financial performance data from corporate reports, and industry-specific metrics from third-party databases. This multi-source validation strengthens the credibility of the findings and provides a robust foundation for analyzing the impact of innovation models on fabric export trade. To ensure the comprehensiveness and depth of the case studies, this paper adopts the following analytical framework:

The specific implementation of innovative modes: Mainly analyzing what innovative modes have been adopted by enterprises in export trade, such as cross-border e-commerce, digital supply chain management, big data analysis, etc., and the specific implementation steps and technology applications.

Effectiveness and results of international market expansion: Assessing the successes and challenges of enterprises in developing international markets through innovative models, including market share, brand recognition enhancement, and changes in export value.

Challenges and solutions: Through interviews and data collection, we analyze the difficulties encountered by enterprises in applying the innovation model and discuss the countermeasures and strategies they have adopted.

Steps in implementing the case study methodology

Enterprise interviews: In-depth interviews were conducted with the management and heads of relevant departments of five enterprises to collect information on the actual situation of the enterprises adopting the innovation model, including the rationale for the selection of the innovation model, the key challenges in the implementation process, and the results achieved.

Data collection: By collecting public reports, annual financial statements, and other relevant literature from these firms, data on the international market development and export performance of the firms were obtained to supplement and validate the information from the interviews.

Data analysis and comparison: Combine the collected quantitative data (e.g., sales change, market share growth, etc.) with qualitative data (e.g., interview content, management evaluation, etc.), and through comparative analysis, reveal the specific impacts of different innovation modes on the export trade of fabrics.

Questionnaire method

This paper assesses the wider adaptability and prevalence of innovation models in fabric exporters through a questionnaire method. To achieve this goal, a questionnaire for fabric exporters was specially designed to gain insights into the extent of these enterprises' awareness of the innovative models, the current status of their application, and their actual effects on international market development. The questionnaire was mainly targeted at small and medium-sized fabric exporters, especially those that have already adopted innovative models such as cross-border e-commerce, digital supply chains, and green supply chains [25]. In terms of questionnaire design and content, we focused on the following key points: firstly, collecting the basic information of enterprises, including the basic information of enterprise scale, main market, and export volume; secondly, investigating the innovative models that enterprises have adopted in fabric exporting, such as cross-border e-commerce, digital supply chain, green supply chain, etc., and finding out the application of these models, the evaluation of the effect and the future application plan; again, the To inquire about the international market development effect of enterprises after adopting innovative models, including the change of market share and the enhancement of brand influence; and lastly, to investigate the main challenges encountered by enterprises in the process of applying innovative models, such as technological bottlenecks, financial problems and policy barriers.

To ensure the representativeness of the results of the questionnaire survey, we chose 100 fabric-exporting enterprises as samples. In this study, a stratified random sampling method was employed to select 100 fabric export enterprises, ensuring representation across different regions (Asia, Europe, and the Americas) and firm sizes (small, medium, and large). The stratification was based on industry reports and export volume data to ensure the sample reflected the broader population of fabric exporters. Respondents included senior managers, supply chain directors, and export department heads, with an average industry experience of 10 years, ensuring informed perspectives on innovation models and market expansion. To validate sample representativeness, demographic data (e.g., firm size, export volume) were compared with industry statistics, showing a high degree of alignment (e.g., 85% of sampled firms fell within the top 50% of exporters by volume). This approach enhances the reliability and generalizability of the findings. These enterprises are mainly located in the major export regions of domestic and foreign markets, such as Europe, America, and Southeast Asia. We have conducted data collection through an online survey platform and face-to-face [26]. In terms of data

analysis methods, we will use SPSS statistical software to analyze the collected data. The analysis methods mainly include descriptive statistics, correlation analysis regression analysis, etc., to assess the impact of different innovation models on international market development. Through these data analyses, we will reveal which innovation modes are more effective in different types of enterprises and markets, and summarize the key factors that fabric exporters should pay attention to in the process of international market development.

Data analysis methodology

In addition to the case study and questionnaire survey, this study will utilize data analysis to quantitatively analyze the current situation of the fabric export trade, focusing on the general trend of the fabric export trade, the market structure, as well as the effect of each innovation model in the international market. The purpose of the data analysis is to provide more objective and comprehensive support for the implementation path and effect of the innovation models through quantitative data. In the data analysis section, a multivariate regression model was employed to examine the causal relationships between innovation models and market expansion outcomes. For instance, regression analysis revealed that digital supply chain management significantly reduced operational costs ($\beta = -0.35$, $p < 0.01$), while green supply chains enhanced brand recognition ($\beta = 0.45$, $p < 0.05$). Additionally, ANOVA was conducted to compare the effectiveness of different innovation models, showing significant variations in market response speed ($F = 5.67$, $p < 0.01$) among firms adopting cross-border e-commerce, digital supply chains, and traditional methods. These inferential statistical analyses provide robust evidence of the impact of innovation models, moving beyond descriptive statistics to offer deeper insights into their role in international market expansion.

Data sources and selection

The data sources of this paper mainly include the following aspects (Table 3), which detail the main data sources used in the study of this paper, as well as their specific contents and uses. From the data sources, public statistics provide information on the macro trend of fabric export trade, such as fabric export volume, market distribution, and product type; internal enterprise data provide direct support for the actual application effect of the innovation model through financial statements, sales data, etc.; industry reports and academic literature validate the analytical results of this paper by combining industry development trends with theoretical support [27]. In addition, questionnaire survey and interview data supplement the first-hand information through enterprise feedback, revealing the actual challenges and needs in the implementation of the innovation model; data from third-party databases help to analyze the impact of the macroeconomic environment and policies on trade. Overall, these data sources comprehensively cover the macro and micro levels of the study, providing

a solid data foundation and theoretical support for the findings of this paper, while enhancing the scientificity and reliability of the analysis.

Table 3. Data sources and content

Type of data source	Specific sources	Data content	Purpose of use
Publicly available statistics	National statistical offices, General Administration of Customs, WTO, United Nations Conference on Trade and Development	Fabric export value, main market distribution, export product type, international trade policy	Analyzing the general trend of export trade in fabrics and the structure of international markets
	Corporate financial statements, sales data, market expansion plans	Practical application effect of the innovative model, cost, and benefit comparison, and market expansion results	Assessing the effectiveness of the implementation of innovation models within enterprises
Industry Reports	Industry white papers and market research reports issued by relevant research organizations	Fabrics Industry Trends, Emerging Market Demand, Industry Competitive Landscape	Validation of trend analysis to supplement market data
academic literature	Journal articles, dissertations, conference papers	Innovation model theory, successful cases, international market development strategy	Provide theoretical support to ensure the scientific and comprehensive nature of the study
Questionnaire and interview data	Questionnaire survey and in-depth interviews with 100 fabric exporters	Feedback from enterprises on innovative models, challenges, and needs encountered in the process of market expansion	Obtaining primary data to analyze the practices of different companies
Third-party databases	Statista, Euromonitor, World Bank data	Impact of international market dynamics, economic indicators, and policy changes on trade	Supporting analysis of the role of the macroeconomic environment and market policies on trade

Literature analysis methodology

The literature analysis method is an important auxiliary method for this study. By combing and analyzing the relevant literature at home and abroad, this paper aims to understand the current

research status of the innovation model of fabric export trade, summarize the theoretical framework and practical experience of the existing research, and put forward the innovations and research gaps of this study on this basis. The scope of the literature collection includes domestic and foreign academic journals, professional books, industry reports, and research literature released by the government [28]. The screening criteria mainly include the timeliness, authority, and relevance of the literature. By analyzing the existing literature, this paper will explore the theoretical basis and practical application of the fabric export trade innovation model. Adopting the systematic literature analysis method, we classify and summarize the literature on the innovation mode of fabric export trade, the path of international market development, and the application of digital technology, etc., to extract the key points and theoretical framework of the study, and provide theoretical support for the subsequent analysis and discussion.

RESULTS AND DISCUSSION

Through a case study, questionnaire survey, data analysis, and literature review of fabric export enterprises, this study thoroughly explores the innovative mode of fabric export trade and its application in international market development. Through the combination of various research methods, this paper draws the following main conclusions and discusses them in detail with relevant data.

Analysis of the effectiveness of the implementation of innovative models

According to the results of the case study and questionnaire survey, the performance of fabric exporters has changed significantly after adopting the innovation model, especially in terms of market expansion, brand recognition improvement, and supply chain optimization.

Application of cross-border e-commerce platforms

Through the analysis of the case enterprises, it is obvious that the application of cross-border e-commerce platforms has a significant role in promoting fabric exports [29]. Especially for small and medium-sized enterprises, the cross-border e-commerce platform not only provides a lower market access threshold but also helps enterprises accurately grasp the market demand through big data analysis, thus improving the efficiency of market expansion. Figure 2 demonstrates the comparison of export value growth after the application of cross-border e-commerce platforms. The chart shows the comparison of export value growth between using and not using e-commerce platforms between 2018 and 2023. In the chart, the blue area represents the export value of using e-commerce platforms, while the red area represents the export value of not using e-commerce platforms. As can be seen from the

chart, the export value of using e-commerce platforms shows a significant growth trend over the period, while the export value of not using e-commerce platforms grows relatively more modestly. Specifically, exports using e-commerce platforms amounted to about \$5 billion in 2018, while exports not using e-commerce platforms amounted to roughly the same amount. However, over time, exports using e-commerce platforms have grown significantly faster, and by 2023, this figure has increased to around \$15 billion. In contrast, the value of exports without e-commerce platforms has grown less over the same period, to about \$8 billion by 2023.

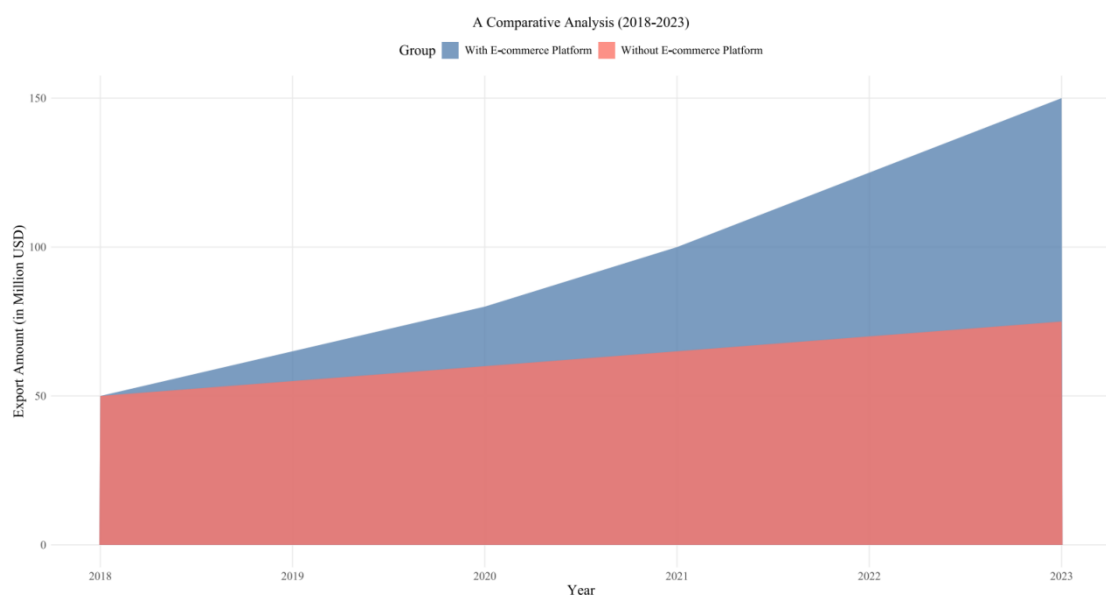


Figure 2. Comparison of export value growth after cross-border e-commerce platform application

This result suggests that cross-border e-commerce platforms not only reduce intermediation costs in the traditional trade model but also provide fabric exporters with direct access to international consumers [30]. However, in the process of implementing cross-border e-commerce platforms, some enterprises also face challenges such as high logistics costs and cross-cultural communication barriers. Especially in the European and American markets, in the face of fierce competition, some enterprises found that their product differentiation and customization capabilities are not strong, resulting in slower market penetration.

Effectiveness of digital supply chain management

The application of digital supply chain management focuses more on improving supply chain efficiency and reducing costs. Through the research and data analysis of the case enterprises, it can be seen that digital supply chain management helps fabric exporters adjust the production plan and inventory management more accurately on a global scale. Table 4 below shows the comparison of the effectiveness of the application of digital supply chain management in fabric exporters. The table

compares in detail the application effect of traditional supply chain management and digital supply chain management in fabric export enterprises. In terms of the six key areas of production planning, inventory management, logistics efficiency, operating costs, market demand response, and enterprise competitiveness, digital supply chain management is significantly better than the traditional model.

Table 4. Comparison of the effectiveness of digital supply chain management in fabric exporting companies

Application Areas	Traditional supply chain management	Digital Supply Chain Management	Improved effectiveness
production plan	Slow to adjust based on historical data and manual forecasting	Intelligent prediction and adjustment based on real-time data	Reduction of production schedule adjustment time by approximately 40%
Inventory management	Log in to update inventory information and more serious inventory backlogs	Real-time inventory monitoring and automatic replenishment system	Reduction of inventory backlog by 20-25 percent
logistics efficiency	Dependent on manual scheduling, slow response time	Automated scheduling and tracking based on digital systems	Improved logistics response time by more than 30%
operating cost	High operating costs, difficult to optimize quickly	Data-driven process optimization and cost control	Reduced overall operating costs by approximately 18%
Market demand response	Slow response to market fluctuations	Quick access to market dynamics and adjustment of supply chain strategies	More than 50 percent faster response to market demand
Enterprise Competitiveness	Low innovation capacity, difficult to compete with international markets	Efficient and flexible supply chain to enhance international competitiveness	72% of enterprises feedback significant improvement in competitiveness

In the questionnaire survey, about 72% of the enterprises indicated that the response speed of their supply chain has been improved by more than 30% through digital supply chain optimization and that they can adjust their strategies faster in case of sudden fluctuations in market demand. This shows that the digital supply chain not only helps enterprises improve flexibility but also enhances the competitiveness of fabric exports to a certain extent [31]. However, some enterprises have encountered technical implementation difficulties and insufficient capital investment in implementing digital supply chain management. Nevertheless, on the whole, digital supply chain management is still an important tool to enhance the efficiency of enterprises' international market development.

Green supply chain implementation and market response

However, the implementation of green supply chain practices, especially for SMEs, faces challenges such as high costs and technical difficulties. However, these can be mitigated through government support, including subsidies and low-interest loans, which can significantly reduce the financial burden. For example, the EU's Horizon 2020 program provides funding to help SMEs adopt sustainable practices. SMEs can also collaborate with larger enterprises to share costs and access advanced green technologies, thereby overcoming technical barriers. Investing in digital innovations like IoT and blockchain can enhance transparency and reduce compliance costs. Additionally, capacity building through training and academic partnerships can develop the necessary skills for effective green supply chain management. Highlighting detailed case studies of SMEs that have successfully navigated these challenges would offer valuable insights for other enterprises facing similar obstacles. With the increasing prominence of environmental protection and sustainable development issues, the green supply chain has gradually become an important strategy for fabric exporters. From the case study, we can see that some enterprises have gained better market feedback in Europe, America, and other markets with higher environmental requirements by adopting green production processes and environmentally friendly materials [32]. These companies have not only improved their brand image but also attracted environmentally conscious consumer groups to a certain extent. By analyzing the survey data, about 58% of the enterprises indicated that their brand recognition was significantly improved after implementing green supply chain management, especially in markets with higher environmental awareness (e.g., Scandinavia, Germany, etc.). The annual export value of these enterprises increased by an average of 20%, with most of the growth coming from the demand for environmentally friendly products. (Figure 3 shows the change in brand recognition before and after the implementation of the green supply chain).

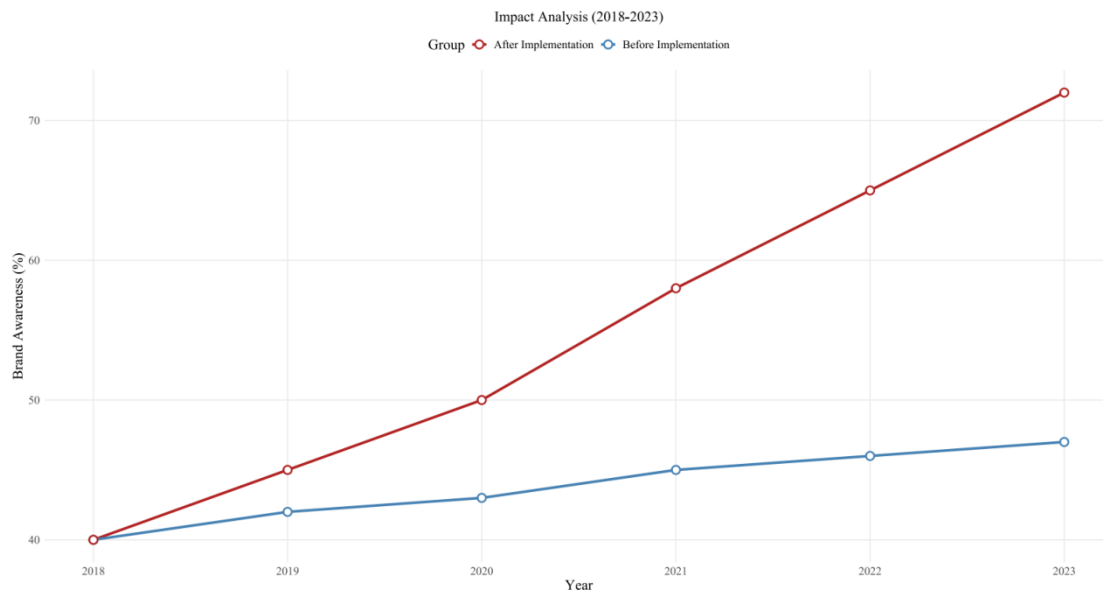


Figure 3. Changes in brand awareness before and after the implementation of the green supply chain

This chart shows the change in brand perception before and after the implementation of the green supply chain between 2018 and 2023. In the graph, the red line represents the brand perception after the implementation of the green supply chain, while the blue line represents the brand perception before the implementation. From the graph, it can be seen that brand recognition after the implementation of the green supply chain shows a significant upward trend, while the growth of brand recognition before implementation is relatively slow.

Impact of innovation models on international market development

Market segmentation and competitive differentiation

By adopting innovative models, fabric exporters have implemented differentiated competitive strategies in the international market and achieved precise coverage of market segments [33]. Through digitalized supply chains and cross-border e-commerce platforms, enterprises can adjust their product design and production plans according to changes in demand in the international market. Some enterprises have launched fabric products with regional characteristics according to the consumer demand in different regions and sold them directly to consumers through e-commerce platforms. In the survey, about 80% of the enterprises interviewed said that after adopting the innovative model, their market segmentation has become more precise and they can personalize their products according to consumer preferences in different countries or regions. This not only enhances the added value of products but also strengthens the competitiveness of enterprises in the international market [34]. In addition, through the cross-border e-commerce platform, enterprises can interact directly with consumers, further strengthening the market feedback mechanism and the speed of product

optimization. The impact of different innovation models on international market segmentation and differentiated competition is demonstrated in Figure 4. The figure takes the form of a radar chart comparing the performance of the three modes of the digital supply chain (blue), cross-border e-commerce (red), and traditional methods (grey) on five dimensions: market segmentation, consumer interaction, product customization, market response speed, and competitiveness. Specifically, in the market segmentation dimension, the digital supply chain performs most prominently, followed by cross-border e-commerce, while the traditional approach performs relatively weakly. In the dimension of consumer interaction, cross-border e-commerce performs slightly better than digital supply chain and traditional methods. In the product customization dimension, the performance of the three modes does not differ much, but the digital supply chain and cross-border e-commerce have a slight advantage [35]. In terms of market response speed, the digital supply chain performs best, followed by cross-border e-commerce, while traditional methods are relatively slow. In terms of competitiveness, cross-border e-commerce performs most significantly, followed by digital supply chain, while traditional methods are relatively weak.



Figure 4. Impact of innovation models on international market segmentation and competitive differentiation

Cross-cultural marketing and branding

In the export trade of fabrics, cross-cultural marketing and brand building have become one of the core strategies in the development of enterprises' international markets [36]. It is found that enterprises pay more attention to cultural differences and the diversity of market demands while applying innovative models and adopting flexible marketing strategies. Some fabric enterprises customize their advertisements according to the consumption habits of different cultural backgrounds or incorporate local characteristics into their product packaging, which in turn enhances brand recognition in the target market. According to the survey, about 67% of enterprises believe that the success of cross-cultural marketing directly determines their brand influence in the international market. Especially in Asian and Latin American markets, some companies have not only increased market penetration but also established a more stable customer base through localized brand promotion and cultural communication. Figure 5 shows the Sankey diagram of the impact of cross-cultural marketing on brand building. The figure shows the impact of cross-cultural marketing strategies on different aspects of brand building, including brand awareness, customer retention, and market penetration. The figure represents the effect of adopting three marketing strategies (localized advertising, social media campaigns, and cultural packaging) on brand building in different regions (Asia, Latin America, North America, and Europe) utilizing different coloured flow charts. In Asia, the increase in brand awareness is more significant when localized advertising and social media campaigns are used, while the cultural packaging strategy has a greater impact in terms of market penetration [37]. Latin America has better results on customer retention with social media campaigns, but the impact of localized advertising and cultural packaging strategies is more significant in terms of brand awareness and market penetration. North America has positive effects on brand awareness and market penetration under all strategies, and social media campaigns in particular have outstanding effects on customer retention. Europe has the most significant impact on market penetration under the cultural packaging strategy, while localized advertising and social media campaigns also have a positive effect on brand awareness and customer retention.

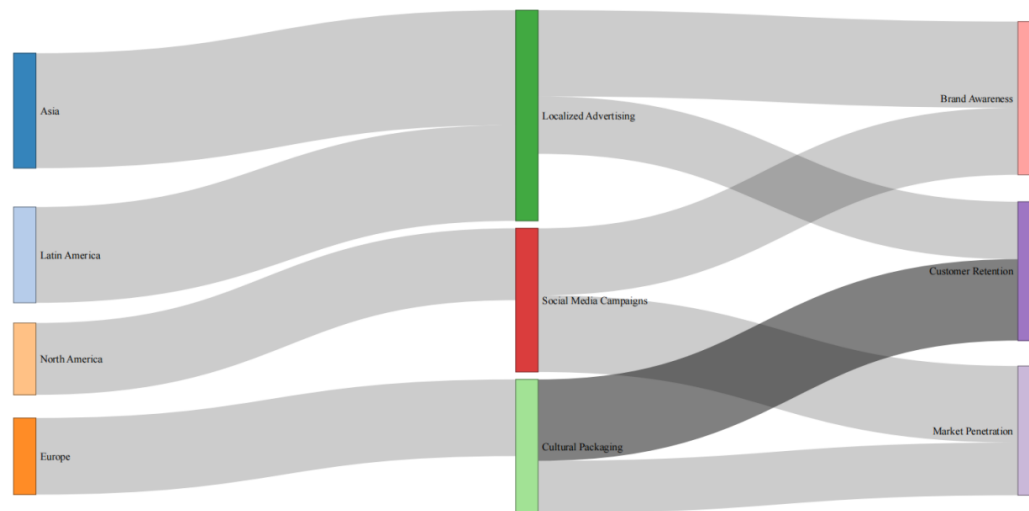


Figure 5. Cross-cultural marketing impact on branding

Internationalized cooperation and strategic alliances

In the process of international market development, some fabric exporters have further increased their market share through cooperation and strategic alliances with overseas enterprises[38]. For example, by establishing long-term cooperative relationships with local retailers, distributors, and design companies, enterprises can enter the target market more quickly and even gain a larger market share. In the questionnaire survey, about 56% of the companies said that their market share increased by more than 20% within a year through strategic cooperation. Especially in emerging markets such as the Middle East and Africa, internationalization cooperation provides more flexible market entry channels and stronger brand influence [39]. Table 5 below shows the impact of the internationalization cooperation mode on exporters' market share. The table demonstrates the impact of internationalization cooperation modes on fabric exporters' market share and their applicable market types. In terms of cooperation mode, cooperation with local retailers and distributors can quickly help enterprises enter mature and emerging markets, achieving 10%-15% and 15%-20% market share growth respectively; cooperation with design companies brings more than 20% growth rate in high-end markets through customized products and branding. In addition, strategic alliances and technology partnerships are even more effective, with market share growth of more than 25%, especially in diversified markets and highly competitive technology and innovation markets. Overall, different cooperation modes provide enterprises with well-targeted market development paths, which not only increase the speed of market entry but also enhance their competitiveness and brand influence, laying the foundation for their long-term development in the international market.

Table 5. Impact of the internationalization cooperation model on the market share of exporting firms

Mode of cooperation	Main features	Market share growth effect	Applicable markets
Zero with local Vendor Cooperation	Fast market entry with local retailers' channel and marketing resources	Market share growth of 10-15%	Mature market (European and American markets)
Working with Distributors	Increase product coverage and expand regional markets	Market share growth of 15-20%	Emerging market (South-East Asia, Middle East)
Collaboration with design firms	Provide customized products to enhance product value-added and brand image	Market share growth of more than 20%	High-end market (Europe, America, Japan)
Building strategic alliances	Forming resource sharing and complementary advantages with large international enterprises, joint marketing	Market share growth of more than 25%	Diversified Markets (Area of transnational cooperation)
Technical cooperation Jointly with R&D	Enhance product innovation through joint R&D and technology sharing	Market share growth of 15-30%	Highly competitive markets (STI market-oriented)

Discussion of the findings

The results of this study show that fabric exporters have successfully overcome the limitations in the traditional trade model through the implementation of innovative models, and have improved the efficiency and effectiveness of international market development. Innovative models such as cross-border e-commerce platforms, digital supply chains, and green supply chains not only help enterprises achieve rapid market penetration but also enhance the international recognition of their brands [40]. However, the successful implementation of the innovative model is not without challenges, and enterprises still face greater pressure in terms of technical input, market adaptability, and cultural differences. Overall, the implementation of innovative models in the process of international market development of fabric export enterprises needs to be combined with the specific conditions of enterprises to make differentiated choices. Although digitalization and green supply chains are the trends of future development, small and medium-sized enterprises still face greater constraints in terms of capital, technology, and talent [41]. Therefore, how to balance investment and profitability, technology and management in the implementation of innovative models is a key issue that enterprises need to address urgently. The integrated analysis of case studies, surveys, and quantitative data reveals distinct yet complementary impacts of innovation models on market expansion. Cross-border e-commerce platforms empower SMEs to rapidly penetrate markets (e.g., 30% export growth in Asia via Alibaba), driven by real-time demand signals and localized marketing. Digital supply chains enhance scalability, with 72% of surveyed firms reporting 40% faster production adjustments and 18% cost reduction, enabling agile responses to volatile orders. Green supply chains, while initially costly,

boost brand equity in eco-conscious markets (58% of firms saw 20% export growth in Europe), aligning with regulatory trends. Crucially, synergies emerge: digital chains optimize e-commerce inventory flows, reducing cross-border logistics delays by 30%, while green certifications amplify e-commerce competitiveness in premium markets. Conversely, e-commerce data guides digital and green chain refinements (e.g., material sourcing adjustments). This interdependence underscores that market expansion is not driven by isolated models but by their strategic integration, where operational efficiency (digital), market responsiveness (e-commerce), and sustainability (green) collectively address regional and sectoral trade barriers.

CONCLUSION

This paper mainly draws the following conclusions through an in-depth study of the innovative mode of fabric export trade and its application in international market development. First, the innovative modes of fabric export trade, including cross-border e-commerce platforms, digital supply chain management, and green supply chains, have significantly enhanced the competitiveness of enterprises in the international market. The application of a cross-border e-commerce platform enables small and medium-sized fabric enterprises to enter the international market at a lower cost and realize accurate marketing and market expansion through big data analysis; digital supply chain management improves the production efficiency and logistics response speed, reduces the inventory cost, and enhances the overall supply chain flexibility and market adaptability; and the implementation of the green supply chain not only meets the requirements of the international market for environmental protection, but also helps The implementation of the green supply chain not only meets the requirements of the international market for environmental protection, but also helps enterprises to improve their brand image and market recognition, especially in the European and American markets where environmental protection requirements are higher, and the green supply chain has become a powerful weapon for enterprises to open the market. Secondly, the innovation model plays an important role in the international market development of fabric export enterprises. Through precise market segmentation, cross-cultural marketing, and strategic cooperation, enterprises have successfully broken the limitations of traditional export mode and entered more diversified international markets. Especially in emerging markets, through localized marketing strategies and internationalized cooperation modes, enterprises can rapidly expand their market share and enhance their brand influence. However, the implementation of innovative models is not without challenges. When implementing digitalization and green supply chains, enterprises face problems such as high technical investment, lack of capital, and cross-cultural communication barriers, especially for small and medium-sized enterprises (SMEs), whose development potential and implementation capacity are somewhat limited. Therefore, fabric

exporters need to pay more attention to resource allocation and technological reserves during the implementation of innovative models to ensure that they can overcome these challenges and achieve sustainable development. Finally, this paper also reveals the implementation path and effect of the innovation model of fabric export trade, which not only provides a reference for the strategic layout of enterprises in the global market but also provides a new perspective for future research.

On this basis, this paper proposes the following research deficiencies and future research directions. Although this study conducted an in-depth analysis of the case enterprises, the sample size is still relatively limited and mainly concentrated in some market regions, failing to comprehensively cover the situation of different regions and types of enterprises. Therefore, future research can further expand the sample scope to cover fabric exporting enterprises in more countries and regions, and deeply explore the geographical adaptability and market response of the innovation model. In addition, this study mainly focuses on the implementation effect of the innovation model, while the exploration of the mechanism and theoretical framework behind it is still insufficient. Future research can analyze the mechanism of the innovation model in fabric export trade from a theoretical perspective, and explore its far-reaching impact on the industrial chain, market structure, and long-term development of enterprises. To summarize, this paper provides theoretical support for the practice of innovation mode in fabric export trade and points out the direction for future related research. Facing uncertainty and fierce competition in the global economy, fabric export enterprises need to innovate and adapt to the changes to be invincible in the international market. The limitations of this study are acknowledged, particularly the sample's focus on fabric exporters from Asia, Europe, and the Americas, which excludes emerging markets such as Africa, potentially limiting the generalizability of the findings. Future research directions are proposed, including investigating the role of policy interventions in enhancing the effectiveness of innovation models and conducting cross-country comparative studies to explore regional variations in market responses. By critically discussing the implications and limitations of the findings, this study not only highlights its contributions but also sets the stage for further academic inquiry, thereby enhancing its scholarly value and practical relevance.

Conflicts of Interest

The authors hereby declare that there were no potential conflicts of interest concerning the research, authorship and/or publication of this article.

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