



Construction of a Third-Party Logistics Service Quality Evaluation System Based on Customer Experience Maps

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Abstract. With the intensification of competition in the logistics industry, customer experience has become a key factor affecting the service quality of third-party logistics (3PL). This paper constructs a comprehensive evaluation system based on customer experience maps, aiming to comprehensively assess the service quality of 3PL. By analyzing the various touchpoints in the logistics service process, identifying key experience factors, and combining quantitative and qualitative methods for evaluation, this study show that the evaluation system can effectively identify the strengths and weaknesses of service quality and provide a scientific basis for the service improvement of 3PL companies. Compared to traditional models like SERVQUAL, this system integrates customer experience maps to reveal previously unidentified service gaps (e.g., real-time tracking issues).

Keywords: Third-Party Logistics, Customer Experience Maps, Service Quality Evaluation, Customer Satisfaction

1 Introduction

3PL plays an important role in modern supply chains, and its service quality directly affects customer satisfaction and corporate competitiveness[1]. With the increasing market competition, customers' requirements for logistics services are becoming higher, focusing not only on service efficiency and cost but also on the experience during the service process[2]. Therefore, constructing a 3PL service quality evaluation system based on customer experience is of great significance. This paper aims to build a 3PL service quality evaluation system based on customer experience maps, analyze the various touchpoints in the logistics service process, identify key experience factors, and conduct a comprehensive evaluation using both quantitative and qualitative methods to provide a scientific basis for the service improvement of 3PL companies. Unlike SERVQUAL's static dimensions, our framework dynamically captures service quality through customer journey mapping.

2 Literature Review

With the intensification of competition in the logistics industry, service quality has become a key factor affecting the competitiveness of 3PL companies[3]. Early research mainly focused on the construction of service quality evaluation indicator systems, such as the classic SERVQUAL model proposed by Parasuraman et al., [4], which measures service quality through five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. This model has provided a basic framework for the quantitative evaluation of service quality and has been widely applied in various industries. However, with the changing market and the diversification of customer needs, traditional service quality dimensions alone are no longer sufficient to comprehensively evaluate customer experience[5][6]. While prior studies have expanded service quality dimensions (e.g., cost-effectiveness), none have systematically integrated customer experience maps to map service failures across the entire logistics journey.

In recent years, researchers have begun to focus on more dimensions of evaluation indicators, such as cost-effectiveness, technological innovation capabilities, and environmental performance. In terms of evaluation methods, scholars have proposed various methods, such as the Analytic Hierarchy Process (AHP), fuzzy comprehensive evaluation, and Data Envelopment Analysis (DEA)[7]. In recent years, with the development of big data and artificial intelligence technologies, new evaluation methods such as machine learning and neural networks have also begun to be applied in the evaluation of 3PL service quality[8].

Customer experience maps, as a visualization tool, are used to depict the various touchpoints in the interaction process between customers and companies, analyzing the experience and feelings of customers at each stage. In recent years, customer experience maps have been widely applied in various fields, such as retail, finance, and tourism[9][10]. Customer experience is closely related to service quality, and a good customer experience can significantly improve customer satisfaction and loyalty. Therefore, introducing customer experience maps into the 3PL service quality evaluation system can provide a more comprehensive assessment of service quality [11]. Zeithaml et al., [12]demonstrated that service quality significantly impacts customer behavior, with high-quality service substantially enhancing customer satisfaction and loyalty, thereby bringing long-term economic benefits to companies. Zeithaml, [12]proposed a customer satisfaction model, analyzing the key drivers of customer satisfaction and pointing out that customer satisfaction is not only influenced by service quality but also by customer expectations, perceived value, and customer engagement. Frow & Payne (2013) introduced a strategic framework for customer experience management, emphasizing the application of customer experience maps in identifying and optimizing customer experience at various touchpoints throughout the customer journey [13].

In summary, existing research has provided a rich theoretical basis for logistics companies to optimize service quality. However, there are still some shortcomings. Most studies focus on specific dimensions of service quality, lacking a comprehensive analysis of the entire customer experience journey. Moreover, with the rapid devel-

opment of digital technologies, how to utilize big data and artificial intelligence to enhance the accuracy and real-time nature of service quality evaluation is an important direction for future research.

In summary, existing research has provided a rich theoretical basis for logistics companies to optimize service quality. However, most studies focus on specific dimensions of service quality, lacking a comprehensive analysis of the entire customer experience journey. This paper aims to fill this gap by introducing customer experience maps to evaluate 3PL service quality more comprehensively

2.1 Evaluation Status of 3PL Service Quality

Early research mainly focused on the construction of service quality evaluation indicator systems, such as the five dimensions proposed by Gupta & Walton : reliability, responsiveness, assurance, empathy, and tangibles. In recent years, researchers have begun to focus on more dimensions of evaluation indicators, such as cost-effectiveness, technological innovation capabilities, and environmental performance. In terms of evaluation methods, scholars have proposed various methods, such as the Analytic Hierarchy Process (AHP), fuzzy comprehensive evaluation, and Data Envelopment Analysis (DEA). In recent years, with the development of big data and artificial intelligence technologies, new evaluation methods such as machine learning and neural networks have also begun to be applied in the evaluation of 3PL service quality.

2.2 Application of Customer Experience Maps

Customer experience maps are a visualization tool used to depict the various touchpoints in the interaction process between customers and companies, analyzing the experience and feelings of customers at each stage. In recent years, customer experience maps have been widely applied in various fields, such as retail, finance, and tourism. Customer experience is closely related to service quality, and a good customer experience can significantly improve customer satisfaction and loyalty. Therefore, introducing customer experience maps into the 3PL service quality evaluation system can provide a more comprehensive assessment of service quality. . The summary of the application of customer experience maps are shown in Table 1 below.

Table 1. Application of Customer Experience Maps

Industry	Application
Retail	Analyzing the entire process of customers from entering the store to leaving, including browsing products, trying on clothes, and checking out.
Financial Services	Financial institutions use customer experience maps to analyze the experience of customers in processes such as account opening, loan application, and online banking.
Tourism	Travel companies use customer experience maps to analyze

	the entire process from booking a trip to the end of the journey, including booking, itinerary arrangement, accommodation, and transportation.
Healthcare	Medical institutions use customer experience maps to analyze the entire process of patients from making an appointment to the end of treatment, including registration, waiting for consultation, diagnosis, treatment, and recovery.
Logistics	Logistics companies use customer experience maps to analyze the entire process from placing an order to receiving the goods, including order processing, goods transportation, goods tracking, and delivery.
E-commerce	E-commerce platforms use customer experience maps to analyze the entire process from browsing products to completing a purchase, including product search, product detail page, shopping cart, payment, and logistics delivery.
Software and Technology	Software and technology companies use customer experience maps to analyze the entire process from downloading software to using it, including software installation, function use, and technical support.

3 Construction of a 3PL Service Quality Evaluation System Based on Customer Experience Maps

3.1 Construction of Customer Experience Maps for 3PL Services

Customer experience maps, as a visualization tool, depict the various touchpoints in the interaction process between customers and 3PL companies, analyzing the experience and feelings of customers at each stage. The specific construction steps are shown in Table 2.

Table 2. the construction steps of customer experience maps

Stage	User Needs	User behavior	Pain point	User evaluation
Awareness Stage	Learn about reliable logistics service providers	Browse advertisements, social media, and word-of-mouth recommendations	Advertisements are unclear, making it difficult to distinguish the strengths and weaknesses of different service providers It is hard to judge the authenticity of reviews on social media	“There are many ads, but I don’t know which service is better.” “There are many reviews on social media, but I don’t know which ones are genuine.”

			Limited information from friends' recommendations, making it difficult to fully understand service providers	"The service my friend recommended is good, but I want to know more options."
Con- sider- ation Stage	Compare the services of different logistics providers	Visit multiple logistics providers' web-sites	The website information is incomplete, making it difficult to find key service information.	There is too little information on the website to compare different service providers.
	Understand the service price and customer evaluation	Check service prices; read customer reviews	Price information is not transparent, and it is difficult to distinguish between true and false customer reviews.	Price information is not clear, customer reviews are difficult to distinguish between true and false, it is difficult to make a choice.
	Consult customer service to understand the details of the service	Contact customer service for consultation	Slow customer service response, detailed problem answers are not provided.	The customer service response is too slow, and the problem answers are not detailed enough, which is very annoying."
Pur- chase Stage	Complete the order quickly and conveniently	Place an order on the website	The ordering process is complex and prone to errors.	The ordering process is too complicated, there were many problems in the middle, and a lot of time was wasted.
Usage Stage	Get timely help when you encounter problems	Contact customer service for help	Slow customer service response, low problem-solving efficiency.	When problems occur, the customer service response is too slow, and the problem solving is also very slow, which is very helpless.
	Real-time understanding of cargo transportation status	Inquire about cargo tracking information through the website or customer service	The cargo tracking information is not updated in time, making it difficult to know the cargo's location in real time.	"The cargo tracking information updates too slowly, making it difficult to know the location of the goods in real time, which is very anxiety-inducing
	Ensure the goods are delivered on time and safely.	Pay attention to the timeliness and intact rate of goods transportation	Unstable cargo transportation time; high risk of cargo damage.	The delivery time of goods is unstable, and sometimes the goods will be damaged, which is very worrying.
Deliv- ery	Convenient and quick	Sign for the goods	The delivery process is not smooth,	The delivery process was not very smooth, the signing process-

Stage	receipt of goods		and the signing procedures are cumbersome.	dure was a bit troublesome, and it is hoped that it can be more convenient.
	Confirm that the goods are intact;	Check if the goods are damaged	The process of handling goods damage is complicated and compensation is not timely.	“Sometimes the goods are damaged, the handling process is complicated, and the compensation is not timely, which is very unsatisfactory.
After - sales Stage	Provide timely feedback on service experience and solve problems	Feedback service experience through customer service and raise questions	Customer service feedback is not timely, and the problem-solving efficiency is low.	When providing feedback on service experience, the customer service response was too slow, and the problem resolution was also very slow, which was very disappointing
	obtain a satisfactory solution	Waiting for customer service to solve the problem	The solution is not ideal, and the problem keeps recurring.	The solution is not ideal, and the problem sometimes recurs, which is very annoying.

3.2 Service Quality Evaluation Index System

Based on the theory of customer experience map, this study constructs a comprehensive evaluation index system for the quality of 3PL services. The customer experience map helps to identify key experience factors by visualizing various touchpoints of customers in the logistics service process, thus evaluating the service quality more comprehensively. specific evaluation index system is shown in the Table 3 below:

Table 3. 3PL service quality evaluation system based on customer experience map

Dimension	Indicator	Description	The corresponding touchpoints in the customer experience map
Reliability	Order processing speed	The time interval from when an order is placed to when it is processed.	Website ordering; customer service consultation
	Goods transportation time limit	The time interval from the shipment of goods to their delivery.	Goods transportation; goods tracking
	Goods intact rate	The proportion of goods that were not damaged during transportation.	Goods delivery
Responsiveness	Customer service response	The response time of customer service personnel to cus-	Customer service consultation

	speed	customer inquiries or complaints.	
Assurance	Problem solving time	The time needed for customer service staff to solve customer problems.	Customer service consultation, problem solving
	Stability of service quality	Consistency of service quality across different time periods and different customers.	Goods transportation; goods tracking
	Service commitment fulfillment rate	The actual fulfillment ratio of the services committed by the enterprise.	Order placement; goods delivery
Empathetic	Service attitude of customer service staff	The attitude and professionalism of customer service personnel in their interactions with customers.	Customer service consultation
	Attention to customer needs	The degree of emphasis and response speed of enterprises to customer needs.	Customer service consultation, problem solving
Tangibility	The degree of modernization of logistics facilities	The modernization level of logistics facilities and the advancement of equipment.	Goods transport; goods delivery
	Cleanliness of the means of transport	The cleanliness and maintenance condition of the means of transport.	Goods transport
	Personalized service	Whether the enterprise provides personalized services that meet the specific needs of customers.	Customer service consultation; order customization
Customer experience	Information transparency	Whether the enterprise provides logistics information to customers in a timely and accurate manner.	Goods tracking, order status update
	Interactive convenience	The convenience of customer interaction with the business, such as website ease of use, diversity of customer service channels, etc.	Website ordering; customer service consultation
	Emotional connection	Whether the enterprise establishes an emotional connection with customers through services, such as brand loyalty, customer satisfaction, etc.	Customer service consultation; customer feedback

3.3 Evaluation Methods

- (1) Quantitative Evaluation Methods such as the Analytic Hierarchy (AHP) or Data Envelopment Analysis (DEA) are used to quantify the evaluation indicators, calculating the weights and comprehensive scores of each indicator. Applied AHP to determine weights through pairwise comparisons of experts.
- (2) Qualitative Evaluation Qualitative analysis of customer experience is conducted through customer feedback, interviews, social media analysis, etc., to understand the specific feelings and suggestions of customers service quality.
- (3) Comprehensive Evaluation Combining the results of quantitative and qualitative evaluations, a comprehensive evaluation of the quality of 3PL services is conducted to the strengths and weaknesses of service quality and propose improvement measures.

4 Empirical Analysis

4.1 Data Collection and Research

A well-known 3PL company selected as the research object, which has a high market share and customer satisfaction in the logistics industry. The questionnaire was designed based on the key touchpoints identified in the customer experience map. A total of 500 questionnaires were distributed, after removing 50 invalid responses through logic checks and duplicate filtering and 450 valid responses were collected. The sample included customers from different regions and industries to ensure representativeness; some customers are selected for in-depth interviews to their specific views and suggestions on service quality. Through crawler technology, customer comments and feedback on social media are collected for sentiment analysis.

4.2 Results Analysis and Discussion

The comprehensive score of the quantitative evaluation results is 85 points, indicating that the service quality of the 3PL enterprise is generally good, reveals significant opportunities for optimization in transportation. The 'goods transportation timeliness' indicator scored 72/100, with 35% of respondents reporting delays exceeding 48 hours.

In terms of qualitative evaluation, customers are relatively satisfied with the order processing speed and customer service response speed, but have put forward some improvement suggestions for the timeliness of goods transportation and the service attitude of customer service personnel.

Considering the above evaluation analysis results comprehensively, it shows the service quality of the 3PL enterprise is generally good, but it needs to be further improved in terms of the timeliness of goods transportation and the service attitude customer service personnel in order to improve customer satisfaction.

This study constructs a comprehensive evaluation system for 3PL service quality based on customer experience maps. The results show that the system can effectively

identify strengths and weaknesses in service quality. However, the study is limited by its reliance on self-reported data. Future research could incorporate real-time data from logistics systems to enhance the accuracy of the evaluation

5 Conclusions and Prospects

Based on the customer experience map, this article constructs a comprehensive evaluation system, which analyzes various touchpoints in the logistics service process, identifies experience factors, and combines quantitative and qualitative methods for comprehensive evaluation. The results of the study show that this evaluation system can effectively identify the strengths and weaknesses of service and provide scientific basis for the service improvement of 3PL enterprises. This framework supports digital transformation by enabling IoT sensor data integration with CEM for real-time service monitoring.

Future research should focus on two critical technological advancements: First, developing AI-powered predictive analytics frameworks leveraging LSTM networks to anticipate service failures through historical complaint data analysis, which would enable early detection of systemic service gaps and dynamic adjustment of evaluation indices based on real-time operational feedback. Second, constructing digital twin-enabled monitoring ecosystems that seamlessly synchronize customer experience map (CEM) insights with IoT sensor data streams across 3PL operational networks, thereby visualizing service quality metrics in multidimensional logistics landscapes and automating root-cause analysis through reinforcement learning algorithms. These innovations would not only enhance predictive accuracy and operational efficiency but also establish new methodological foundations for service quality evaluation in smart logistics ecosystems.

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