Revista Científica Nexo
Vol. 37, No. 02, pp. 02-37/Diciembre 2024

ISSN-E 1995-9516
Universidad Nacional de Ingeniería (UNI)
https://www.camjol.info/index.php/NEXO
http://dx.doi.org/10.5377/nexo.v37i2.19795

IMPACTO DE LOS SISTEMAS DE INFORMACIÓN LOGÍSTICA EN LA EXPORTACIÓN DESEMPEÑO ORGANIZACIONAL Y PERCEPCIONES DE SERVICIO AL CLIENTE: UNA REVISIÓN

LOGISTICS INFORMATION SYSTEMS IMPACT ON EXPORTING ORGANIZATIONAL PERFORMANCE AND CUSTOMER SERVICE PERCEPTIONS: A REVIEW

Selva Staub[1], Sam Khoury[2,*], Kouroush Jenab[3]

[1] Bandirma Onyedi Eylul University, Dept. of International Trades, Bandırma/Balıkesir, Türkiye.
[2] Spring Hill College, Academic Affairs, Mobile, AL, USA.
[3]Morehead State University, Department of Engineering Sciences, Morehead, KY, USA.

(recibido/received: 5-15-2024; aceptado/accepted: 9-9-2024)

ABSTRACT

This study investigates the influence of perceived logistics service quality on the organizational performance of export-oriented businesses in the Aegean Region. Employing a cross-sectional design, we gathered data from 252 firms through surveys, focusing on their collaboration, expectations, and preferences with logistics service providers. The collected data underwent comprehensive analysis using various statistical methods through SPSS 22.0 software, including One-Way Analysis of Variance (ANOVA), Correlation Analysis, and Regression Analyses, to assess the relationships between variables. Our research findings reveal significant differences in customers' expectations of logistics services concerning factors such as operational information sharing, on-time delivery, and order processing. However, variables related to logistics information technologies and problem-solving show no significant differences in influencing customers' preferences for logistics companies. Notably, responsiveness emerges as a significant variable affecting customers' preferences. In conclusion, this study underscores the pivotal role of technological applications in enhancing both business performance and customer satisfaction within the logistics sector. These findings contribute to the understanding of how logistics service quality and information technologies intersect to shape organizational outcomes, emphasizing the importance of meeting evolving customer satisfaction criteria in this service-based industry.

Keywords: Logistics; Logistics Information Systems; Logistics Service Quality; Organizational Performance; Perceived Service Quality

RESUMEN

Este estudio investiga la influencia de la calidad percibida del servicio logístico en el desempeño organizacional de las empresas orientadas a la exportación en la región del Egeo. Empleando un diseño transversal, recogimos datos de 252 empresas a través de encuestas, centrándonos en su colaboración,

* Autor de correspondencia.
Correo: skhoury@shc.edu

expectativas y preferencias con los proveedores de servicios logísticos. Los datos recopilados se sometieron a un análisis exhaustivo utilizando diversos métodos estadísticos a través del software SPSS 22.0, incluyendo el análisis de varianza unidireccional (ANOVA), el análisis de correlación y los análisis de regresión, para evaluar las relaciones entre las variables. Los resultados de nuestra investigación revelan diferencias significativas en las expectativas de los clientes sobre los servicios logísticos en relación con factores como el intercambio de información operativa, la entrega a tiempo y el procesamiento de pedidos. Sin embargo, las variables relacionadas con las tecnologías de la información logística y la resolución de problemas no muestran diferencias significativas en la influencia de las preferencias de los clientes hacia las empresas de logística. En particular, la capacidad de respuesta surge como una variable importante que afecta las preferencias de los clientes. En conclusión, este estudio subraya el papel fundamental de las aplicaciones tecnológicas en la mejora del rendimiento empresarial y la satisfacción del cliente dentro del sector logístico. Estos hallazgos contribuyen a la comprensión de cómo la calidad del servicio logístico y las tecnologías de la información se cruzan para dar forma a los resultados organizacionales, enfatizando la importancia de cumplir con los criterios de satisfacción del cliente en evolución en esta industria basada en servicios.

Palabras clave: Logística; Sistemas de Información Logística; Calidad del Servicio Logístico; Desempeño Organizacional; Calidad de servicio percibida

1. INTRODUCTION

In today's export-oriented business landscape, efficient logistics operations are crucial for maintaining competitiveness and meeting customer demands. This study delves into the intricate relationship between perceived logistics service quality, technology adoption, and organizational performance within the Aegean Region's export-oriented businesses. Through data analysis, the research uncovers pivotal insights with practical implications for both businesses and researchers.

The study underscores the paramount importance of operational information sharing within supply chains. It highlights how investments in systems facilitating real-time information exchange can elevate logistics service quality, leading to enhanced visibility and informed decision-making. Embracing digital transformation and collaborative technologies becomes imperative for businesses to stay competitive in today's dynamic marketplace.

Additionally, the research emphasizes the critical role of responsiveness in shaping customers' preferences for logistics companies. Quick responses to inquiries, timely issue resolution, and adaptability to changing customer needs emerge as essential elements for logistics providers to prioritize. By investing in personnel training and efficient communication channels, businesses can meet customer expectations effectively.

Moreover, the study highlights the positive impact of logistics information technologies on both service quality and organizational performance. Investments in advanced systems like Warehouse Management Systems (WMS) and Transportation Management Systems (TMS) streamline operations, reduce errors, and enhance service delivery, driving overall business success.

Furthermore, adopting a customer-centric approach is emphasized. Actively seeking customer feedback, understanding preferences, and tailoring services accordingly can improve satisfaction and foster loyalty. Regular surveys and feedback mechanisms serve as invaluable tools for refining offerings and strengthening relationships.

The study also stresses the value of building long-term partnerships with logistics service providers. Enduring collaborations lead to deeper understanding and more effective collaboration, benefiting both parties involved. Therefore, this study offers actionable insights, emphasizing technology, customer-

centricity, and collaboration in achieving logistics service excellence for sustained success in an evolving landscape.

2. LITERATURE REVIEW

Logistics quality forms the foundation of logistics companies as it provides a competitive advantage. Utilizing a firm's logistics service capabilities is an effective tool for establishing a strong bond between the firm and its customers (Bowersox. 2013; Bowersox et al., 2008) as it focuses on improving logistics service quality and being prepared to meet changing customer satisfaction criteria (Thai, 2013, p.114). Recent studies indicate the importance of focusing on the ability of logistics to provide quality service and generate increased customer satisfaction and loyalty. The logistics sector today represents a classic example of the development of a service-based industry (Gil Saura et al., 2008, p.651).

In this process, original service quality models have been adapted to logistics service by developing logistics attributes that can be defined by customers and applying complementary services that can be applied to the logistics service content (Feng et al., 2007, p.927). Bienstock et al. (1997) extended the model of physical distribution service quality (PDSQ) that forms the basis for Grönroos's (1984) original service quality model by enhancing the difference between technical and functional quality, ensuring the alignment of technical quality with service outputs, and functional quality with service delivery processes (Rafiq & Jaafar, 2007, p.159). In a study by Mentzer et al. (1989), it was proposed that the items produced can be classified according to the timeliness, availability, and quality dimensions of physical distribution service quality (PDSQ). Quality, in this sense, is determined by the form and composition of the delivered order, i.e., the condition of the delivered products. In the study, a Logistics Service Quality Model (LSQ) was developed, and logistics service quality includes not only the physical distribution aspects of service but also encompasses marketing and customer services from a customer-based perspective (Mentzer et al., 1989; Bienstock et al., 1997, p.32; Rafiq & Jaafar, 2007, p.159). Through the research of Mentzer et al. (1999), it was found that logistics service quality could be examined in nine dimensions. These dimensions (Mentzer et al., 1999, p.6) are:

1. Information quality
2. Order processes
3. Order quantities
4. Timeliness
5. Order accuracy
6. Order quality
7. Order status
8. Management of order discrepancies
9. Quality of communication personnel

The importance of logistics service quality (LSQ) in influencing customer satisfaction has long been recognized. Some empirical studies provide strong support for the connection between improvements in logistics service quality and increased customer satisfaction. LSQ has also been linked to market share, customer satisfaction, and loyalty. One distinctive feature of Mentzer et al.'s research is that it focuses on examining how logistics firms create value for customers, primarily from the customer's perspective, rather than an operational perspective. However, outside of Mentzer et al.'s work, there have been relatively few systematic studies on the development and measurement of the logistics service quality concept.

Primary research conducted on logistics information systems and organizational performance, as well as customer service, illuminated the following aspects:

Aslan et al. (2018) applied structural equation modeling to data from 164 manufacturing firms in the Gaziantep, Adıyaman, and Kahramanmaraş provinces. Their analyses demonstrated that logistics service quality and the use of logistics information technologies had a significantly positive impact on logistics and firm performance.

Bakan and Şekkelli (2018) investigated the impact of logistics service quality on customer loyalty in the Kahramanmaraş province. Their study revealed that meeting quality standards in service delivery, technological infrastructure, error-free order processing, effective communication, and collaboration with customers in essential areas enhanced logistics service quality and, in turn, customer loyalty.

Çağlar (2014) examined the relationship between the use of information technologies in logistics firms, customer satisfaction, and business performance. The study showed that the increased use of information technologies in business operations had a positive impact on logistics activities and customer satisfaction.

Closs and Savitskie (2003) examined logistics information systems in two dimensions: internal and external. Their study revealed that internal logistics information systems improved customer service performance but were ineffective in customer integration. External logistics information systems, on the other hand, were found to have a significant impact on five out of twelve performance elements.

Closs and Xu (2000) found that the application of logistics information technologies exhibited significantly different behavior patterns across regions and types of businesses worldwide.

Hırlak et al. (2017) examined the relationships between perceived service quality, customer satisfaction, customer loyalty, and some socio-demographic variables. Their research revealed a positive and significant relationship between service quality and customer satisfaction and loyalty. They also found that the dimensions of service quality perceived by customers positively influenced customer satisfaction and loyalty.

Karadeniz and Başaran (2014) researched the influence of information systems used by logistics firms on customers' perception of service quality. They concluded that information systems used by logistics companies were perceived as enhancing the quality of services.

Olah et al. (2018) investigated the role of industry-specific Information Technology (IT) advancements and their impact on the revenue, as well as the earnings before tax, of Logistics Service Providers (LSPs). Their study examines how these advancements influence the flexibility and integration of LSPs into supply chains. The findings indicate that a company's revenue, earnings before tax, and level of supply chain integration are influenced by their industry-specific IT investments. The study suggests that IT investments will continue to be crucial in the future, offering LSPs competitive advantages and greater financial rewards when implementing cutting-edge technologies.
Onay and Kara (2009) investigated the effects of logistics outsourcing practices on organizational performance. Their study revealed that businesses could better cope with competitive intensity by enhancing their organizational expertise through logistics outsourcing.

Özdemir and Dulkadir (2017) investigated the impact of information technology functions on organizational performance. Their study showed that when information technologies' external focus and internal integration functions were used together, they had a significant positive impact on organizational performance.

Savıtskıe (2007) explored the impact of internal and external logistics information systems on twelve identified performance elements at an international level. His findings showed that internal information systems effectively influenced decision-making processes, overall business performance, and corporate

competitiveness. External logistics information systems were shown to have a significant influence on five out of twelve performance elements.

Sayın and Altuğ (2016) examined the opinions of retail companies operating in the Thrace Region regarding logistics activities and services. They found that international businesses placed greater importance on aspects such as on-time delivery, customer service quality, the use of information technologies, and damage-free product delivery. Additionally, foreign-owned companies were shown to prioritize areas such as employee training, supplier selection, inventory control, and systematic data recording.

Tekin et al. (2005) researched the usage of information technologies by logistics firms in the city of Konya. They found that using information technologies was important for responding to customer demands more rapidly and effectively reducing operational costs.

Information systems are a concept distinct from computers or technology. In terms of content, it refers to a system where data is collected, processed, and distributed (Long, 2016). In today's world, information has become one of the most important assets of businesses, alongside production factors such as labor, capital, and natural resources. However, information alone is not sufficient to gain a competitive advantage. It also requires integrating information with technology and the presence of knowledgeable individuals and organizations to guide this information. For businesses to adapt to potential future changes and generate successful predictions, they need to leverage information technologies (Çekerol, 2013).

Many logistics service providers have recognized the importance of using technologies that can help manufacturers, warehouses, and retailers communicate more efficiently with each other in terms of competition (Ramanathan et al., 2014). This article aims to examine the information technologies used in businesses and the fundamental logistics information systems they utilize.

Transitioning to the research purpose, methodology, and data analysis, the aforementioned studies collectively contribute valuable insights into the intricate relationships between logistics information systems, organizational performance, and customer service. In the following sections, we delve into the specific objectives of our research, the methodology employed for data collection and analysis, and the key findings that shed light on the dynamics shaping the interplay between information technologies, logistics operations, and overall business performance.

3. RESEARCH PURPOSE, METHODOLOGY, AND DATA ANALYSIS

3.1. Research Purpose and Significance

Organizational performance is defined as the evaluation of all efforts made to achieve the objectives of a business, resulting in an output or outcome at a specific point in time (Lee et al. 2022; Maaz & Ahmad, 2022; Onay & Kara, 2009, p.598).
Logistics Information Systems primarily encompass computer systems, computer networks, cloud systems, and automatic identification and data collection systems. In today's rapidly changing and developing technological landscape, the effective use of logistics information systems not only provides competitive advantages for firms in the market but also contributes to making internal operations easier for employees and management within the company (Cahyono et al., 2023; Ertek & Aba, 2013, p.1). As businesses grow and become more complex, the need for external data has highlighted the importance and necessity of information processing. The use of information technologies in logistics businesses also affects the organizational structure of the company. Information technologies influence organizational performance and support the development of a transparent organizational structure (Fu et al., 2022; Çekerol, 2013, p.173; Çağlar, 2014, p.43).

This study aims to examine the impact of logistics information systems used in logistics services on the perceived service quality by firms engaged in export in the Aegean region and the effect of logistics information systems on organizational performance.

Companies that provide logistics services win customer satisfaction by offering high-quality services and gain a competitive advantage over their competitors. The significance of this study is to measure the perception of logistics services received by export-oriented companies and to examine the effects of their perceived service quality on organizational performance, highlighting the advantages they provide.

3.2. Research Methodology

In this section, information about the main population and sample, data collection method, and the scope and limitations of the research is provided.

3.2.1. Main Population and Sample of the Research

Most scientific research relies on numerical measurements for collecting the desired data. The delineation of permissible data subjects for collection and the corresponding collection scope are intertwined with the fundamental notions of the target population and the sampling framework. The main population is the widest target population to be studied in research. The main population or universe is typically too large, costly, impossible, or unnecessary to reach out to in its entirety, so general trends from the main population are often determined by creating a sample (Cash et al., 2022, p.8). The sample selection technique is chosen as a suitable sampling technique for the research. In the quota sampling technique, the core is to include all participants who answered the questionnaire. This process continues until the desired sample size is reached (Rahman et al., 2022, p.42).

The survey instrument used in this research study plays a critical role in gathering data about the perceptions and preferences of export-oriented businesses in the Aegean Region. It's worth noting that the survey instrument drew from previous studies and adapted scales to measure logistics service quality and organizational performance effectively.

The survey included questions related to logistics service quality, organizational performance, and the usage of logistics information technologies. It is important to highlight the adaptation and validation process of these survey items to ensure they are contextually relevant and reliable.

3.2.2. Sampling Methods

The use of quota sampling in this research is both a strength and a potential source of bias. Quota sampling allows for including participants who are representative of various categories within the sample, ensuring that the survey captures perspectives from different segments of export-oriented businesses. However, it is essential to acknowledge that quota sampling may introduce bias, as participants are not randomly selected. Therefore, the findings may not be fully generalizable to the entire population of export-oriented businesses in the Aegean Region.
Furthermore, it would be beneficial to provide more details about how the quota sampling categories were determined and whether any stratification techniques were applied to ensure a more representative sample.

3.2.3. Data Analysis Techniques

The data analysis techniques employed in this study, including One-Way Analysis of Variance (ANOVA), Correlation Analysis, and Regression Analyses, are appropriate for the research objectives. ANOVA is used

to assess differences between groups, correlation analysis explores relationships between variables, and regression analysis helps evaluate the effects of variables on each other.
The reliability analysis, specifically Cronbach's Alpha, was used to assess the internal consistency of the measurement scales. This demonstrates the care taken to ensure the validity and reliability of the survey instrument.

3.2.4. Potential Biases and Limitations in Methodology

Sampling Bias: Quota sampling, while useful for capturing diverse perspectives, may introduce bias. Participants who respond to email surveys may differ systematically from those who do not, potentially impacting the sample's representativeness.

Non-Random Sampling: The lack of random sampling may limit the generalizability of the findings beyond the sample studied.

Response Bias: It is essential to consider the possibility of response bias, where participants may provide socially desirable responses or have biases in their perceptions of logistics service quality and organizational performance.

Survey Instrument Adaptation: While the study adapted existing survey instruments, it would be helpful to provide more details about the adaptation and validation process to ensure the robustness of the measurement scales.

3.2.5. Practical Implications

The findings of this study have practical implications for export-oriented businesses in the Aegean Region. Companies can use the insights regarding the impact of logistics service quality and logistics information technologies on organizational performance to make informed decisions. For example, the study highlights the significance of factors like operational information sharing and responsiveness in meeting customer expectations, which can guide businesses in improving their logistics services.

Moreover, the emphasis on the importance of logistics information technologies suggests that investments in technology can enhance service quality and ultimately contribute to organizational performance. Companies should consider adopting advanced logistics information systems to streamline operations and better serve their customers.

3.2.6. Limitations and Areas for Future Research:

The study acknowledges several limitations, including the potential bias introduced by sampling methods and the challenges of data collection. Additionally, the research duration exceeded the planned timeline, which could have affected the sample's composition and responses. Future research in this area should address these limitations and consider alternative sampling methods to enhance the study's generalizability.

Further investigations could explore the specific strategies and technologies businesses use to improve logistics service quality and their impact on performance. Longitudinal studies could provide insights into how these relationships evolve over time. Additionally, research could delve into the role of external factors, such as economic conditions or industry-specific trends, in shaping logistics service quality and organizational performance.

In conclusion, this research offers valuable insights into the relationships between logistics service quality, logistics information technologies, and organizational performance. Despite its limitations, the study

provides a foundation for future research and offers practical guidance for businesses seeking to enhance their logistics operations and customer satisfaction.

3.2.7. Data Collection Method

A questionnaire method was used to collect the necessary data for the research. Questionnaires collect option-based information about views, opinions, preferences, behaviors, expectations, and tendencies related to a specific subject. The questionnaire method is preferred to determine the perceptions of participants (Cash et al., 2022; Doğanay et al., 2012).

The questionnaire used in the study was obtained from two different sources. To measure the perception of logistics service, the questionnaire used by Başaran (2014) in the master's thesis titled "The Effect of Information Systems Used in Logistics Companies on Customer Service Perception and Research" was used. The questionnaire for this study was developed to measure the perception of logistics service for all logistics firms in Turkey. The scale used in the study was selected, and these scales were adapted to Turkish and improved by taking into consideration the dimensions of the Logistics Service Quality Scale developed by Mentzer et al. (1999), the Service Quality Scale developed by Parasuraman et al. (1988), and the dimensions of logistics information systems developed by Closs and Savitskie (2003).

In this study, to evaluate organizational performance, the scale used in the master's thesis titled "The Effect of Logistics Information Systems on Business Performance and an Application" by Cengiz (2006) was used as the second source. In this study to examine the effect of information technologies used in logistics firms in Turkey on business performance, the scale was considered suitable for evaluating organizational performance and was added to the questionnaire.

Out of 6,187 companies registered with the Aegean Exporters' Association, 5,660 companies with email addresses were sent an e-survey via Google Forms between April 2021 and June 2022. A total of 412 companies did not receive the questionnaire. As a result, 252 responses were received out of 5,248 companies. The analysis of the questionnaire was conducted for a total of 252 different companies.

3.2.8. Hypotheses of the Study

- H1: Operational Information Sharing and Logistics Information Technologies have an effect on Employee Quality.
- H2: Operational Information Sharing and Logistics Information Technologies have an effect on Information Quality.
- H3: Operational Information Sharing and Logistics Information Technologies have an effect on Timeliness.
- H4: Operational Information Sharing and Logistics Information Technologies have an effect on Problem Resolution.
- H5: Operational Information Sharing and Logistics Information Technologies have an effect on Responsiveness.
- H6: Operational Information Sharing and Logistics Information Technologies have an effect on the Order Process.
- H7: Operational Information Sharing and Logistics Information Technologies have an effect on Satisfaction.
- H8: Operational Information Sharing and Logistics Information Technologies have an effect on Organizational Performance.

3.2.9. Scope and Limitations of the Research

The scope of the research is to examine the perception of logistics services provided by companies engaged in exports in the Aegean region and to investigate the effect of logistics information systems on their organizational performance.

The factors that constitute the limitations of the research are the reluctance of companies to respond to surveys sent via email and their distrust in clicking the link within the email. In addition, due to factors such as the difficulty of reaching knowledgeable employees and a busy work schedule, the research process exceeded the planned duration.

3.2.10. Data Analysis

The data collected for this research was analyzed using SPSS 22.0 software. The frequency tables and explanations for the collected data are provided below.

Table 1. Number of different logistics service providers companies work with.

	Frequency	**Percentage**	**Cumulative Percentage**
1	23	9.1	9.1
2	38	15.1	24.2
3	52	20.6	44.8
4	60	23.8	68.7
5 and more	79	31.3	100
Total	**252**	**100**	

As seen in Table 1, out of the 252 companies surveyed, 23 companies, constituting 9.1%, work with 1 logistics company, 38 companies, constituting 15.1%, work with 2 logistics companies, 52 companies, constituting 20.6%, work with 3 logistics companies, 60 companies, constituting 23.8%, work with 4 logistics companies, and 79 companies, constituting 31.3%, work with 5 or more logistics companies.

Table 2. Primary expectations of companies from logistics service providers.

	Frequency	**Percentage**	**Cumulative Percentage**
Low Cost	70	27.8	27.8
On-Time Delivery	102	40.5	68.3
Value to the Customer	18	7.1	75.4
Extensive Service Network	20	7.9	83.3
Service Quality	42	16.7	100
Total	252	100	

As shown in Table 2, the majority of the 252 companies, constituting 40.5%, indicated that their primary expectation from the logistics service providers is on-time delivery. 27.8% of the participating companies, constituting 70 companies, mentioned low cost as their primary expectation, 16.7% of them, constituting 42 companies, mentioned service quality, 7.9% of them, constituting 20 companies, mentioned an extensive service network, and finally, 7.1% of them, constituting 18 companies, mentioned value to the customer.

Table 3. Reasons for choosing the most preferred logistics service provider.

	Frequency	Percentage	Cumulative Percentage
Cost	53	21	21
Quality Service	91	36.1	57.1
Delivery Time	74	29.4	86.5
Professionalism	24	9.5	96
No Particular Reason	10	4	100
Total	252	100	

Twenty-one percent of the participating companies chose cost as the reason for choosing their most preferred logistics company, 36.1% chose quality service, 29.4% chose delivery time, and 9.5% chose professionalism. 4% stated that they had no particular reason for choosing their most preferred logistics company. As shown in Table 3, quality service plays an important role in the choice of logistics companies by the participating companies.

Table 4. Working periods with the most preferred logistics company.

	Frequency	Percentage	Cumulative Percentage
Less than 1 year	21	8.3	8.3
1-2 years	47	18.7	27
3-4 years	69	27.4	54.4
5 years	37	14.7	69
More than 5 years	78	31	100
Total	252	100	

As analyzed in the data in Table 4, the participating companies' working periods with their most preferred logistics companies were specified as follows: 8.3% for less than 1 year, 18.7% for 1-2 years, 27.4% for 3-4 years, 14.7% for 5 years, and 31% for more than 5 years.

Table 5. Rate of meeting expectations of the most preferred logistics service provider.

	Frequency	Percentage	Cumulative Percentage
20%	4	1.6	1.6
40%	14	5.6	7.1
50%	31	12.3	19.4
60%	56	22.2	41.7
80%	127	50.4	92.1
100%	20	7.9	100
Total	252	100	

According to the data in Table 5, 50.4% of the participating companies stated that their expectations from the most preferred logistics company were met at an 80% rate. 22.2% of them mentioned a 60% rate, 12.3% mentioned a 50% rate, 7.9% mentioned a 100% rate, 5.6% mentioned a 40% rate, and 1.6% mentioned a 20% rate of meeting their expectations.

Table 6. Average monthly logistics shipment quantities of companies.

	Frequency	Percentage	Cumulative Percentage
1-5	34	13.5	13.5
6-10	40	15.9	29.4
11-15	36	14.3	43.7
16-20	38	15.1	58.7
21-25	46	18.3	77
26+	58	23	100
Total	252	100	

As shown in Table 6, 13.5% of the participating companies ship an average of 1-5 shipments per month, 15.9% ship 6-10 shipments, 14.3% ship 11-15 shipments, 15.1% ship 16-20 shipments, 18.3% ship 21-25 shipments, and 23% ship 26 or more shipments per month.

Table 7. Logistics information technologies used by customers.

(*) The number exceeds the sample size because the question allowed for multiple responses.

	Frequency	Percentage	Cumulative Percentage
Logistics Information Technologies	222	35.5	13.5
Email. Teleconferencing, etc. Communication Systems	66	10.5	29.4
Enterprise Resource Planning (ERP) Systems and Applications	40	6.4	43.7
Customer Relationship Management (CRM) Applications			58.7
Order/Product/Vehicle Tracking Systems (GPRS, GPS, Geographic Information Systems)	80	12.8	77
Automatic Identification/Data Collection Systems (RFID and Barcode)	42	6.7	
Information by SMS	92	14.7	100
Smartphone Applications (Android, iOS, Windows Mobile, etc.)	62	9.9	
Electronic Data Interchange (EDI)	16	2.6	
Extranet (Supplier and Distribution System Relationships)	6	1	
Total	626*	100	

The results of the participants' responses to the question about the level of understanding and usage of logistics information technologies provided by logistics service-providing companies by customers are presented in Table 7. This question allowed participants to select multiple responses to measure the usage level of each logistics information system.

The data on participants' perceptions of "Logistics Information Systems," is measured on a 5-point Likert scale (1: Strongly Disagree - 5: Strongly Agree), is provided in Table 8.

Table 8. Basic descriptive statistics for participants' responses to logistics information systems questions.

Logistics Information Systems	Min.	Max.	Mean	Standard Deviation
Logistics information systems are used adequately and effectively.	1	5	3.62	1.066
The used logistics information systems are sufficient in meeting our needs.	1	5	3.75	0.955
The used information systems infrastructure is increasing to meet our requirements every year.	1	5	3.76	0.923
The latest logistics information technologies and systems are used.	1	5	3.37	1.031
The use of geographic tracking systems is increasing in logistics activities.	1	5	3.75	0.927
The logistics company allows important last- minute changes without reducing efficiency through communication with us.	1	5	3.79	0.998
The logistics information systems used facilitate ecommerce via the internet.	1	5	3.96	0.924
Information regarding order-related activities is shared.	1	5	3.87	0.899
Operational data is shared effectively.	1	5	3.72	0.912
Information sharing is provided through a common data exchange system.	1	5	3.63	1.064
Information sharing can be done in standard and/or customized formats.	1	5	3.72	0.839
Real-time data updating/entry is provided through information technologies.	1	5	3.64	1.083
The rate of information sharing via the used information technologies is decreasing.	1	5	3.37	1.053
Real-time querying of order information is possible.	1	5	3.76	0.958
The previded data facilitates planning future transactions.	1	5	3.97	0.934

Participants' perceptions of "Logistics Service Quality," is measured on a 5-point Likert scale (1: Strongly Disagree - 5: Strongly Agree), are provided in Table 9.

Table 9. Basic descriptive statistics for participants' responses to logistics service quality questions.

Logistics Service Quality	Min.	Max.	Mean	Standard Deviation
Personnel are aware of customers' requests and make an effort to understand their requests.	1	5	3.87	0.77
Personnel have sufficient product and service knowledge and experience.	1	5	3.8	0.78
Personnel have an innovative attitude.	1	5	3.75	0.798
Regular updates are provided regarding requested services.	1	5	3.82	0.912
Information provided about services is appropriate and accessible.	1	5	3.96	0.767
The time between order shipment and delivery is short.	1	5	3.59	0.988
Promised services are provided on time and correctly.	1	5	3.94	0.809
Requested services are processed without delay.	1	5	4.05	0.698

Logistics Service Quality	Min.	Max.	Mean	Standard Deviation
In case of a problem, the logistics company resolves it satisfactorily.	1	5	3.83	0.872
Efforts are made to promptly address issues such as incorrect delivery or damage.	1	5	3.7	0.983
Post-service support activities demonstrate the company's commitment to the service provided.	1	5	3.92	0.848
The logistics company has an innovative attitude.	1	5	3.77	0.861
The logistics company is flexible in non-standard shipments.	1	5	3.74	0.899
Efficient logistics management is provided for returned products.	1	5	3.7	0.846
Special advantages are provided to loyal customers.	1	5	3.75	0.961
Order placement processes are easy.	2	5	4.08	0.687
Orders never go to the wrong person.	1	5	4.02	0.84
What word describes your feelings about the logistics company?	1	5	3.95	0.654
How would you describe your overall impression of the logistics company?	1	5	3.98	0.671

Data regarding the perceptions of the 252 participating companies on the "Organizational Performance" related to their most preferred logistics companies, measured on a 5-point Likert scale (1: Strongly Disagree - 5: Strongly Agree), is presented in Table 10.

Table 10. Basic descriptive statistics for participants' responses to organizational performance questions.

Organizational Performance	Min	Max	Mean	Standard Deviation
Using logistics information technologies has made our company more profitable.	1	5	3.64	1.026
Using logistics information technologies has assisted us in our relationships with customers.	1	5	3.71	993
Using logistics information technologies has positively impacted our company's image.	1	5	3.73	976
Using logistics information technologies has generally improved our company's performance.	1	5	3.82	997

3.2.11. Reliability Analysis and Research Reliability

Reliability pertains to the extent to which a given assessment instrument or measuring scale consistently and accurately gauges the intended construct or dimension over repeated administrations (Coşkun et al., 2015: 124). In scientific studies, the reliability of a measurement tool is determined by the consistency of the results obtained through multiple measurements using the same measurement tool (Doğanay et al., 2012, p.153). The most commonly used method for measuring internal consistency is "Cronbach's Alpha," also known as the alpha coefficient. The alpha value represents an average of all possible split-half combinations of the items. The alpha value ranges from 0 to 1, and an alpha value of at least 0.7 is desirable. However, in exploratory studies, some researchers predict that an alpha value of up to 0.5 can be considered reasonable. However, an important feature of the alpha coefficient is that as the number of items in the scale increases, the alpha value also increases. This can lead to misleading results, as it may result in an artificial increase. The tool that can help in this regard is the calculation of the beta coefficient (Coşkun et al., 2015: 126).

3.2.12. Reliability of the Research

Reliability analysis was conducted for the dependent variables, Logistics Service Quality and Organizational Performance, and the independent variable, Logistics Information Systems. The results of the reliability analysis showed that the variables had very high reliability. This indicates that the variables consistently measured what they intended to measure. The analysis results for the variables are provided in Table 11.

Table 11. Reliability results of the scales.

Question Group	Number of Variables	Cronbach's Alpha Values
Logistics Information Systems	2	0.916
Logistics Service Quality	7	0.915
Organizational Performance	1	0.961

Reliability analyses were conducted for the components of dependent and independent variables, and the results of the reliability analyses for Logistic Information Systems, Logistic Service Quality, and Organizational Performance variables are presented in Table 12.

Table 12. Reliability analysis results of variables.

Scale	Variable Name	Reliability
Reliability Analysis Results of Variables Related to Logistics Information Systems	(1) Logistics Information Technologies	0.863
	(2) Operational Information Sharing	0.838
Reliability Analysis Results of Variables Related to Logistics Service Quality	(1) Personnel Quality	0.847
	(2) Information Quality	0.691
	(3) Timeliness	0.629
	(4) Problem Solving	0.714
	(5) Responsiveness	0.831
	(6) Order Process	0.682
	(7) Satisfaction	0.871
Reliability Analysis Results of Variables Related to Organizational Performance	Organizational Performance	0.961

As seen in Table 12, the reliability of all components is high. Therefore, there is no obstacle to conducting the following analyses using the data obtained with these components. In addition, the data has been transformed logarithmically to ensure normality.

3.2.13. Hypothesis Testing

In this study section, hypotheses were tested using one-way analysis of variance (ANOVA), correlation analysis, and regression analysis.

One-Way Analysis of Variance (ANOVA):

ANOVA test (analysis of variance or F-test) is used to analyze group means and related processes (Gürbüz & Şahin, 2016, p.40). Before conducting a one-way analysis of variance, the homogeneity of variances

should be tested using the Levene test. If the p-value from the Levene test is greater than 0.05, variance homogeneity is assumed (Tosunoğlu & Yücel-Toy, 2007, p.16).

One-way analysis of variance between customers' basic expectations from logistics companies and the variables "operational information sharing," "timeliness," and "order process":

According to the Levene test results, the p-values for operational information sharing (p=0.114), timeliness (p=0.495), and order process (p=0.142) are greater than 0.05, indicating that the variances are homogenous.

Table 13. One-way analysis of variance test - customers' basic expectations from logistics.

ANOVA						
		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
Operational Information Sharing	Between Groups	0.348	4	0.087	6.101	0.000
	Within	3.527	247	0.014		
	Total	3.875	251			
Timeliness	Between Groups	0.225	4	0.056	3.175	0.014
	Within Groups	4.376	247	0.018		
	Total	4.601	251			
Order Processing	Between Groups	0.423	4	0.106	5.184	0.001
	Within Groups	5.036	247	0.02		
	Total	5.459	251			

The results of the one-way analysis of variance test between customers' basic expectations from logistics companies and the variables "operational information sharing," "timeliness," and "order process" are presented in Table 13. According to the analysis results, there are significant differences at the 0.05 significance level between operational information sharing (p=0.000<0.05), timeliness (p=0.014<0.05), and order process (p=0.001<0.05) variables and customers' basic expectations from logistics companies.

Table 14. Pairwise comparisons of the impact of customers' basic expectations on operational information sharing, timeliness, and order process (post hoc tests - Tukey) test results.

	(I) Basic Expectation	**(J) Basic Expectation**	**Mean Differences (I-J)**	**Standard Error**	**Significance Level**
Operational Information Sharing	Extensive Service Network	Low Cost	-0.12762	0.0303	0.000
		Service Quality	-0.12091	0.03246	0.002
Timeliness	Low Cost	On-Time Delivery	0.06945	0.02066	0.008
Order Process	Low Cost	On-Time Delivery	0.07272	0.02216	0.010
		Extensive Service Network	0.11014	0.0362	0.022
	Service Network	On-Time Delivery	0.0823	0.02618	0.016
		Extensive Service Network	0.11972	0.03879	0.019

To determine which groups the differences come from, one of the multiple comparison tests should be performed (Tosunoğlu & Yücel-Toy, 2007, p.16). The Tukey test results were examined to identify which group or groups caused this difference.

According to the Tukey test results (Table 14) for the operational information sharing variable, it is observed that there are significant differences between extensive service network and low cost, as well as between extensive service network and service quality among customers' basic expectations from logistics companies. The difference between extensive service network and low cost in operational information sharing is -0.12762, indicating that the mean of low cost is higher than the mean of extensive service network. The difference between extensive service network and service quality in operational information sharing is -0.12091, indicating that the mean of service quality is higher than the mean of the extensive service network.

For the timeliness variable, the difference between low cost and on-time delivery is 0.06945, indicating that the mean of low cost is higher than the mean of on-time delivery.

Regarding the order process variable, significant differences were observed between low cost and on-time delivery, as well as between service quality and on-time delivery, and between extensive service network and on-time delivery. The difference between low cost and on-time delivery in the order process is 0.07272, indicating that the mean of low cost is higher than the mean of on-time delivery. The difference between service quality and on-time delivery in the order process is 0.08230, indicating that the mean of service quality is higher than the mean of on-time delivery. The difference between extensive service network and on-time delivery in the order process is 0.11972, indicating that the mean of extensive service network is higher than the mean of on-time delivery.

One-way analysis of variance between customers' reasons for choosing logistics companies and the variables "Logistics Information Technologies," "Responsiveness," and "Problem Solving":

According to the Levene test results, the p-values for operational logistics information technologies (p=0.483), responsiveness (p=0.08), and problem-solving (p=0.121) variables are greater than 0.05, indicating that the variances are homogenous.

Table 15. One-way analysis of variance test - customers' reasons for choosing logistics companies.

ANOVA

		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
Logistics Information Technologies	Between Groups	0.134	4	0.034	1.903	0.111
	Within Groups	4.356	247	0.018		
	Total	4.49	251			
Responsiveness	Between Groups	0.303	4	0.076	4.111	0.003
	Within Groups	4.553	247	0.018		
	Total	4.856	251			
Problem Solving	Between Groups	0.083	4	0.021	0.787	0.534
	Within Groups	6.503	247	0.026		
	Total	6.586	251			

The results of the one-way analysis of variance test between customers' reasons for choosing logistics companies and the variables "Logistics Information Technologies," "Responsiveness," and "Problem-Solving" are presented in Table 15.

According to the analysis results, there is no significant difference at the 0.05 significance level between logistics information technologies (p=0.111>0.05) and problem-solving (p=0.534>0.05) variables and customers' reasons for choosing logistics companies. However, there are significant differences at the 0.05 significance level between responsiveness (p=0.010<0.05) and customers' reasons for choosing logistics companies.

Table 16. Pairwise comparisons of the impact of customers' reasons for choosing logistics companies on responsiveness (post hoc tests - Tukey) test results.

	(I) Preference Reasons	(J) Preference Reasons	Average Differences (I-J)	Standard Error	Significance Level
Answerability	Corporate identity	Cost	-0.12898	0.0334	0.001
		Quality of service	-0.10871	0.03116	0.005
		Delivery time	-0.11319	0.03189	0.004

According to the Tukey test results (Table 16) for the responsiveness variable, it is observed that there are significant differences between the reasons for choosing logistics companies, specifically between formality and cost, quality service, and delivery time among the customers' reasons for choosing logistics companies. The difference between formality and cost in responsiveness is -0.12898, indicating that the mean of cost is higher than the mean of formality.

The difference between formality and quality service in responsiveness is -0.10871, indicating that the mean of quality service is higher than the mean of formality. The difference between formality and delivery time in responsiveness is -0.11319, indicating that the mean of delivery time is higher than the mean of formality.

One-way analysis of variance between customers' monthly average logistics shipment quantities and the variables "Personnel Quality," "Information Quality," and "Satisfaction":
According to the Levene test results, the p-values for personnel quality (p=0.416), information quality (p=0.856), and satisfaction (p=0.326) variables are greater than 0.05, indicating that the variances are homogenous.

Table 17. One-way analysis of variance test - customers' monthly average logistics shipment quantities.

ANOVA						
		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
Personnel Quality	Between Groups	0.154	5	0.031	1	0.195
	Within Groups	5	246	0.021		
	Total	5.261	251			
Information Quality	Between Groups	0.078	5	0.016	1	0.672
	Within Groups	6.037	246	0.025		
	Total	6.115	251			
Satisfaction	Between Groups	0.248	5	0.05	2.728	0.02
	Within Groups	4.477	246	0.018		
	Total	4.725	251			

The results of the one-way analysis of variance test between customers' monthly average logistics shipment quantities and the variables "Personnel Quality," "Information Quality," and "Satisfaction" are presented in Table 17. According to the analysis results, there are no significant differences at the 0.05 significance level between personnel quality ($p=0.195>0.05$) and information quality ($p=0.672>0.05$) variables and customers' monthly average logistics shipment quantities. However, there are significant differences at the 0.05 significance level between satisfaction ($p=0.020<0.05$) and customers' monthly average logistics shipment quantities.

Table 18. Pairwise comparisons of the impact of customers' monthly average logistics shipment quantities on satisfaction (post hoc tests - Tukey) test results.

	(I) Preference Reasons	(J) Preference Reasons	Average Differences (I-J)	Standard Error	Significance Level
Satisfaction	1-5	21-25	0.10834	0.03051	0.006

According to the Tukey test results (Table 18), for the satisfaction variable, there are significant differences between customers' monthly average logistics shipment quantities, specifically between 1-5 units and 21-25 units.

The difference between 1-5 units and 21-25 units in satisfaction is 0.10834, indicating that the mean of 1-5 units is higher than the mean of 21-25 units. Therefore, companies with a monthly shipment quantity of 1-5 units are more satisfied with the logistics service provider compared to those with a monthly shipment of 21-25 units.

3.2.14. Correlation Analysis

Correlation analysis is a technique used to determine the strength of the relationship between two variables. The calculated correlation coefficient r ranges between -1 and +1. A correlation coefficient of +1 indicates a perfect positive relationship between variables, -1 indicates a perfect negative relationship, and 0 indicates no relationship between variables (Coşkun et al., 2015: 228).

In addition to the calculated correlation coefficient, the test result indicating whether this coefficient is significant should also be provided, and both results should be evaluated together (Tosunoğlu & Yücel-Toy, 2007: 17).

The correlation analysis results for the relationships between variables are provided in Table 19. When looking at the correlation among groups, the numbers marked with asterisks (**) indicate that there is a relationship between variables at the 1% significance level. According to the analysis results, all relationships between variables are positive. The strongest relationship is 0.774 between operational information sharing and logistics information technologies. The weakest relationship is 0.202 between timeliness and organizational performance.

3.2.15. Regression Analysis

Regression analysis, one of the most widely used techniques in social sciences, is employed to evaluate the relationship between dependent and independent variables (Doğanay et al., 2012, p.184). In this section, regression analysis was conducted to examine the relationship between independent variables and the dependent variable. The backward elimination method was utilized in the analysis. In the backward elimination method, initially, all variables are included in the model. In subsequent steps, variables that do not contribute to the model are removed one by one.

H1: Operational Information Sharing and Logistic Information Technologies variables have an impact on the Personnel Quality variable.

Table 19. Correlation analysis results.

	Operational Information Sharing	**Logistics Information Technologies**	**Personnel Quality**	**Information Quality**	**Timeliness**	**Problem Solving**	**Responsiveness**	**Order Process**	**Satisfaction**	**Organizational Performance**
Operational Information Sharing	1									
Logistics Information Technologies	0.774 (**)	1								
Personnel Quality	0.367 (**)	0.407 (**)	1							
Information Quality	0.287 (**)	0.343 (**)	0.460 (**)	1						
Timeliness	0.219 (**)	0.210 (**)	0.264 (**)	0.282 (**)	1					
Problem Solving	0.439 (**)	0.421 (**)	0.541 (**)	0.407 (**)	0.417 (**)	1				
Responsiveness	0.528 (**)	0.501 (**)	0.552 (**)	0.528 (**)	0.402 (**)	0.673 (**)	1			
Order Process	0.332 (**)	0.329 (**)	0.456 (**)	0.453 (**)	0.372 (**)	0.535 (**)	0.636 (**)	1		
Satisfaction	0.401 (**)	0.399 (**)	0.497 (**)	0.459 (**)	0.349 (**)	0.518 (**)	0.542 (**)	0.439 (**)	1	
Organizational Performance	0.440 (**)	0.45 (**)	0.268 (**)	0.270 (**)	0.202 (**)	0.356 (**)	0.444 (**)	0.297 (**)	0.424 (**)	1

The results of the regression analysis for the independent variables and the dependent variable, "personnel quality," are presented in Table 20 and Table 21. Since the F value corresponds to 25.986, which results in a significance level (p-value) of 0.000, the regression model is generally statistically significant.

Table 20. Regression model summary - personnel quality.

Model	**R**	**R^2**	**Adjusted R^2**	**Standard Error of Prediction**
1	0.416[a]	0.173	0.166	0.13222
2	0.407[b]	0.166	0.163	0.13249

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
b. Predictors: (Constant), *Operational Information Sharing*

Table 21. ANOVA – personnel quality.

ANOVA[a]						
		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
1	**Regression**	0.909	2	0.454		
	Residual	4	249	0.017	25.986	0.000b
	Total	5.261	251			
2	**Regression**	0.873	1	0.873		
	Residual	4.388	249	0.018	49.749	0.000c
	Total	5.261	251			

a. Dependent Variable: *Personnel Quality*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
c. Predictors: (Constant), *Operational Information Sharing*

In the analysis conducted using backward elimination method, initially two independent variables were included in the model. As seen in Table 22, the p-value of the operational information-sharing variable is less than 0.05, indicating that it makes a significant contribution to the model. However, the p-value of the logistic information technology variable is greater than 0.05, indicating that it does not make a significant contribution to the model and has, therefore, been removed from the model.

Table 22. Regression analysis results - personnel quality.

	Model	**Beta**	**St. Error**	**St. Beta**	**T Value**	**P Value**
1	**Logistics Information Technologies**	0.140	0.098	0.129	1.422	0.156
	Operational Information Sharing	0.358	0.106	0.307	3.379	0.001
2	**Operational Information Sharing**	0.475	0.067	0.407	7.053	0.000

The R-value represents the correlation between the dependent variable and the independent variable. A high R-value indicates a strong relationship between the dependent and independent variables, meaning that the independent variable explains a significant portion of the variation in the dependent variable (Coşkun et al., 2015, p.237). In the analysis conducted using the backward elimination method, the R-value was found to be 0.407, indicating a positive and significant relationship between the independent variable and the dependent variable.

R-squared (R2) is the coefficient of determination, representing the percentage of variation in the dependent variable explained by the independent variable (Coşkun et al., 2015, p.237). In the analysis, the R2 value was found to be 0.166. This means that the independent variable, operational information sharing, can explain 16.6% of the variance in the dependent variable, personnel quality.

As evident from the analysis results, the coefficient associated with the operational information-sharing variable that contributes to the model is 0.407, and the associated t-value (t=7.053) and significance level (p-value=0.000) are both less than 0.05. This indicates that a one-unit standard deviation change in the operational information sharing variable will have a 0.407 standard deviation effect on the dependent variable, personnel quality. Furthermore, the positive coefficient of the independent variable indicates a positive relationship between the independent and dependent variables.

H2: Operational Information Sharing and Logistic Information Technologies have an impact on the Information Quality variable.

The results of the regression analysis for independent variables and the dependent variable, "information quality," are provided in Table 23. As seen in Table 24, the F-value is 16.745, and the significance level (p-value) is 0.000, indicating that the regression model is statistically significant.

Table 23. Regression model summary - information quality.

Model	R	R^2	Adjusted R^2	Standard Error of Prediction
1	0.344[a]	0.119	0.111	0.14713
2	0.343[b]	0.117	0.114	0.14694

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
b. Predictors: (Constant), *Operational Information Sharing*

Table 24. ANOVA - information quality.

ANOVA[a]						
		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
1	**Regression**	0.725	2	0.362		
	Residual	5.390	249	0.022	16.745	0.000[b]
	Total	6.115	251			
2	**Regression**	0.717	1	0.717		
	Residual	5.398	250	0.022	33.229	0.000[c]
	Total	6.115	251			

a. Dependent Variable: *Information Quality*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
c. Predictors: (Constant), *Operational Information Sharing*

Table 25. Regression analysis results - information quality.

	Model	**Beta**	**St. Error**	**St. Beta**	**T Value**	**P Value**
1	**Logistics Information Technologies**	0.065	0.11	0.055	0.59	0.556
	Operational Information Sharing	0.376	0.118	0.3	3.192	0.002
2	**Operational Information Sharing**	0.43	0.075	0.343	5.764	0.000

In the analysis conducted through the backward elimination method, initially, two independent variables were included in the model. As seen in Table 25, the p-value of the operational information-sharing variable is less than 0.05, indicating that it makes a significant contribution to the model. However, as indicated, the p-value of the logistic information technology variable is greater than 0.05, indicating that it does not make a significant contribution to the model and has been removed.

The analysis resulted in an R-value of 0.343, indicating a positive and significant relationship between the independent variable and the dependent variable. The R2 value is 0.117, meaning that the independent variable, operational information sharing, can explain 11.7% of the variance in the dependent variable, information quality.

As indicated by the analysis results, the coefficient associated with the operational information-sharing variable that contributes to the model is 0.343, and the associated t-value (t=5.764) and significance level (p-value=0.000) are both less than 0.05. This means that a one-unit standard deviation change in the operational information sharing variable will have a 0.343 standard deviation effect on the dependent

variable, information quality. Additionally, the positive coefficient of the independent variable indicates a positive relationship between the independent and dependent variables.

H3: Operational Information Sharing and Logistic Information Technologies have an impact on the Timeliness variable.

The results of the regression analysis for independent variables and the dependent variable "timeliness" are provided below. In Table 27, the F-value is 6.841, and the significance level (p-value) is 0.000, indicating that the regression model is statistically significant.

Table 26. Regression model summary – timeliness.

Model	R	R^2	Adjusted R^2	Standard Error of Prediction
1	0.228[a]	0.052	0.044	0.13235
2	0.219[b]	0.048	0.044	0.13236

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
b. Predictors: (Constant), *Operational Information Sharing*

Table 27. ANOVA – timeliness.

ANOVA[a]						
		Sum of Squares	**Degrees of Freedom**	**Mean Squares**	**F**	**Significance Level**
1	**Regression**	0.240	2	0.120		
	Residual	4.362	249	0.018	6.841	0.001[b]
	Total	4.601	251			
2	**Regression**	0.221	1	0.221		
	Residual	4.380	250	0.018	12.630	0.000[c]
	Total	4.601	251			

a. Dependent Variable: *Information Quality*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
c. Predictors: (Constant), *Operational Information Sharing*

In the analysis, initially, two independent variables were included in the model, but it was observed that neither of the two variables contributed significantly to the model. Subsequently, through backward elimination, the operational information sharing variable was removed from the model, and as shown in Table 28, the p-value of the logistic information technology variable is less than 0.05, indicating that it makes a significant contribution to the model.

Table 28. Regression model results – timeliness.

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.144	0.099	0.142	1.46	0.145
	Operational Information Sharing	0.109	0.106	0.1	1.024	0.307
2	**Operational Information Sharing**	0.222	0.062	0.219	3.554	0.000

The analysis resulted in an R-value of 0.219, indicating a positive relationship between the independent variable and the dependent variable, timeliness. The R2 value is 0.048, indicating that the independent variable, logistic information technologies, can explain only 4.8% of the variance in the dependent variable, timeliness.
As indicated by the analysis results, the coefficient associated with the logistic information technologies variable that contributes to the model is 0.219, and the associated t-value (t=3.554) and significance level (p-value=0.000) are both less than 0.05. This means that a one-unit standard deviation change in the logistic information technologies variable will have a 0.219 standard deviation effect on the dependent variable, timeliness. Additionally, the positive coefficient of the independent variable indicates a positive relationship between the independent and dependent variables.

H4: There is an effect of Operational Information Sharing and Logistics Information Technologies variables on the Dependent Variable "Problem Solving."

The results of the regression analysis for the independent variables and the dependent variable "problem solving" are provided below.

Table 29. Regression model summary - problem solving.

Model	R	R^2	Adjusted R^2	Standard Error of Prediction
1	0.457[a]	0.209	0.203	0.14465

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

Table 30. ANOVA - problem solving.

ANOVA[a]						
		Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance Level
1	**Regression**	1.376	2	0.688		
	Residual	5.210	249	0.021	32.879	0.001[b]
	Total	6.586	251			

a. Dependent Variable: *Problem Solving*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

As seen in Table 30, the F-value is 32.879, and the significance level (p-value) is 0.000, indicating that the regression model is generally statistically significant.

Table 31. Regression analysis results - problem solving.

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.342	0.108	0.822	3.173	0.002
	Operational Information Sharing	0.264	0.116	0.202	2.275	0.024

As a result of the analysis, as shown in Table 31, the p-values for both independent variables are less than 0.05. Therefore, both independent variables make a significant contribution to the model.

The R-value found in the analysis is 0.457, indicating a positive and statistically significant relationship between the independent variable and the dependent variable. The R^2 value is 0.203, meaning that the independent variables can explain 20.3% of the variance in the dependent variable.

In terms of explanatory power, the most explanatory variable is the logistics information technologies variable (beta = 0.282). The t-value (t = 3.173) related to this variable has a significant level (p-value) of 0.002, which is less than 0.05, indicating a statistically significant contribution. The coefficient for the operational information-sharing variable is 0.202. As the analysis shows, a one-unit standard deviation change in logistics information technologies will have a 0.282 standard deviation effect on the dependent variable "problem solving," while a one-unit standard deviation increase in operational information sharing will have a 0.202 standard deviation effect on the dependent variable "problem-solving." Furthermore, the positive coefficients of the independent variables indicate a positive relationship with the dependent variable.

H5: There is an effect of Operational Information Sharing and Logistics Information Technologies variables on the Dependent Variable "Responsiveness."

The results of the regression analysis for the independent variables and the dependent variable "Responsiveness" are provided below.

Table 32. Regression model summary – responsiveness.

Model	R	R^2	Adjusted R2	Standard Error of Prediction
1	0.548[a]	0.300	0.295	0.11681

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

Table 33. ANOVA – responsiveness.

ANOVA[a]						
		Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance Level
1	**Regression**	1.459	2	0.729		
	Residual	3.397	249	0.014	53.457	0.000[b]
	Total	4.856	251			

a. Dependent Variable: *Responsiveness*

b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

As seen in Table 33, the F-value is 53.457, and the significance level (p-value) is 0.000, indicating that the regression model is generally statistically significant.

Table 34. Regression analysis results – responsiveness.

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.364	0.087	0.35	4.185	0.000
	Operational Information Sharing	0.258	0.094	0.23	2.755	0.006

As a result of the analysis, as shown in Table 34, the p-values for both independent variables are less than 0.05. Therefore, both independent variables make a significant contribution to the model.

The R-value found in the analysis is 0.548, indicating a positive and statistically significant relationship between the independent variable and the dependent variable. The R^2 value is 0.295, meaning that the independent variables can explain 29.5% of the variance in the dependent variable.

In terms of explanatory power, the most explanatory variable is the logistics information technologies variable (beta = 0.350). The t-value (t = 4.185) related to this variable has a significance level (p-value) of 0.000, which is less than 0.05. Therefore, this value signifies a statistically significant contribution. The coefficient for the other independent variable, operational information sharing, is 0.230. As understood from the analysis, a one-standard-deviation change in the logistics information technologies variable will result in a 0.350 standard deviation impact on the dependent variable, "Responsiveness." Similarly, an increase of one standard deviation in the operational information-sharing variable will lead to a 0.230 standard deviation impact on the dependent variable. Furthermore, the fact that the coefficients of the independent variables are positive indicates a positive relationship with the dependent variable.

H6: Operational Information Sharing and Logistics Information Technologies variables have an effect on the Dependent Variable "Order Process."

The results of the regression analysis for the independent variables and the dependent variable, "Order Process," are provided below.

Table 35. Regression model summary - order process

Model	R	R^2	Adjusted R2	Standard Error of Prediction
1	0.351[a]	0.123	0.116	0.13867
2	0.332[b]	0.11	0.106	0.13941

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
b. Predictors: (Constant), *Operational Information Sharing*

Table 36. ANOVA - order process.

ANOVA[a]						
		Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance Level
1	**Regression**	0.671	2	0.335		
	Residual	4.788	249	0.019	17.447	0.000[b]
	Total	5.459	251			
2	**Regression**	0.600	1	0.600		
	Residual	4.858	250	0.019	30.896	0.000[c]
	Total	5.459	251			

a. Dependent Variable: *Order Process*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
c. Predictors: (Constant), *Logistics Information Technologies*

Table 36 indicates that the F value, which corresponds to a significance level (p-value) of 0.000, is 17.447. Therefore, the regression model is generally statistically significant.

Table 37. Regression analysis results - order processing.

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.213	0.103	0.193	2.06	0.040
	Operational Information Sharing	0.213	0.111	0.179	1.915	0.057
2	**Logistics Information Technologies**	0.366	0.066	0.332	5.558	0.000

In the analysis conducted using the backward elimination method, initially, two independent variables were included in the model. As seen in Table 37, the p-value of the logistics information technologies variable is less than 0.05, indicating that it makes a significant contribution to the model. On the other hand, the p-value of the operational information-sharing variable is greater than 0.05, indicating that it does not make a significant contribution to the model and has, therefore, been removed from the model.
The analysis resulted in an R-value of 0.332, indicating a positive and statistically significant relationship between the independent variable and the dependent variable. The R-squared (R2) value is found to be 0.110, meaning that the independent variable, operational information sharing, can explain 11% of the variance in the dependent variable, information quality.

As evident from the analysis results, the coefficient associated with the logistic information technology variable, which contributes to the model, is 0.332. The significance level (p-value) of the t-value (t=2.060) for this coefficient is less than 0.05, indicating that this value represents a statistically significant contribution. In other words, a one-unit standard deviation change in the logistic information technology variable will have a 0.332 standard deviation effect on the dependent variable, personnel quality. Furthermore, the positive sign of the coefficient indicates a positive relationship between the independent variable and the dependent variable.

H7: Operational Information Sharing and Logistic Information Technology variables have an effect on the Satisfaction variable.

The results of the regression analysis for the independent variables and the dependent variable, "satisfaction," are provided in Table 38.

Table 38. Regression model summary – satisfaction.

Model	R	R^2	Adjusted R^2	Standard Error of Prediction
1	0.425[a]	0.180	0.174	0.12471

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

Table 39. ANOVA – satisfaction

ANOVA[a]						
		Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance Level
1	**Regression**	0.852	2	0.426		
	Residual	3.873	249	0.016	27.401	0.000[b]
	Total	4.725	251			

a. Dependent Variable: *Satisfaction*
b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

The F value in Table 39, which corresponds to a significance level (p-value) of 0.000, indicates that the regression model is generally statistically significant.

Table 40. Regression analysis results – satisfaction

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.237	0.093	0.231	2.554	0.011
	Operational Information Sharing	0.213	0.100	0.22	2.427	0.016

As seen in Table 40, the p-values for both independent variables are less than 0.05, indicating that both independent variables make a significant contribution to the model.

The analysis resulted in an R-value of 0.425, indicating a positive and statistically significant relationship between the independent variables and the dependent variable. The R-squared (R2) value is found to be 0.174, meaning that the independent variables can explain 17.4% of the variance in the dependent variable, satisfaction.

In terms of explanatory power, the most significant variable is the logistic information technology variable (beta=0.231), and the significance level (p-value) of the t-value (t=2.554) for this coefficient is less than 0.05, indicating a statistically significant contribution. The coefficient for the other independent variable, operational information sharing, is 0.220. As evident from the analysis, a one-unit standard deviation change in the logistic information technology variable will have a 0.231 standard deviation effect on the dependent variable, satisfaction. Similarly, an increase in one standard deviation in operational information sharing will result in a 0.220 standard deviation effect on the dependent variable, satisfaction. Additionally, the positive sign of the coefficients indicates a positive relationship between the independent variables and the dependent variable.

H8: Operational Information Sharing and Logistic Information Technology variables have an effect on Organizational Performance.

The results of the regression analysis for the independent variables and the dependent variable, "organizational performance," are provided in Table 41.

Table 41. Regression model summary - organizational performance.

Model	R	R^2	Adjusted R^2	Standard Error of Prediction
1	0.477[a]	0.270	0.221	0.15962

a. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*

Table 42. ANOVA - organizational performance.

ANOVA[a]						
		Sum of Squares	Degrees of Freedom	Mean Squares	F	Significance Level
1	**Regression**	1.865	2	0.933		
	Residual	6.344	249	0.025	36.605	0.000[b]
	Total	8.209	251			

a. Dependent Variable: *Organizational Performance*

b. Predictors: (Constant), *Operational Information Sharing and Logistics Information Technologies*
As seen in Table 42, the F value, which corresponds to a significance level (p-value) of 0.000, indicates that the regression model is generally statistically significant.

Table 43. Regression analysis results - organizational performance.

	Model	Beta	St. Error	St. Beta	T Value	P Value
1	**Logistics Information Technologies**	0.294	0.119	0.218	2.476	0.014
	Operational Information Sharing	0.419	0.128	0.228	3.275	0.001

In Table 43, it is observed that the p-values for both independent variables are less than 0.05, indicating that both independent variables make a significant contribution to the model.

The analysis resulted in an R-value of 0.477, indicating a positive and statistically significant relationship between the independent variables and the dependent variable. The R-squared (R2) value is found to be 0.221, meaning that the independent variables can explain 22.1% of the variance in the dependent variable, organizational performance.

In terms of explanatory power, the most significant variable is the operational information sharing variable (beta=0.288), and the significance level (p-value) of the t-value (t=3.275) for this coefficient is less than 0.05, indicating a statistically significant contribution. The coefficient for the other independent variable, logistic information technologies, is 0.218. As evident from the analysis, a one-unit standard deviation change in operational information sharing will have a 0.288 standard deviation effect on the dependent variable, organizational performance. Similarly, increasing one standard deviation in logistic information technologies will result in a 0.218 standard deviation effect on the dependent variable, organizational performance. Additionally, the positive sign of the coefficients indicates a positive relationship between the independent variables and the dependent variable.

4. RESULTS

This study was conducted to investigate the perceived logistics service quality of businesses and its impact on organizational performance. A survey was conducted with the participation of 252 representatives from businesses engaged in exports in the Aegean Region, and the data collected was analyzed using SPSS 22.0 software. Hypotheses developed for the study were tested through 'One-Way Analysis of Variance (ANOVA),' 'Correlation Analysis,' and 'Regression Analysis tests.

The descriptive characteristics of the firms participating in the survey were analyzed through frequency analysis. 31% of the participants stated that they work with five or more logistics service providers. The primary expectations of firms from their logistics service providers are on-time delivery (40.5%) and low cost (27.8%). The reasons why participants prefer the most used logistics service provider are quality (36.1%), delivery time (29.4%), and cost (21%). These percentages indicate that firms prioritize the quality of the services they receive, their primary focus is delivering their products to customers on time, and transportation costs are emphasized.

When asked about the duration of working with their most preferred logistics service provider, 31% of the participants answered more than five years, and 27% answered three to four years. 50.4% of the participants stated that their most preferred logistics company meets their expectations by 80%.

In the study, the relationship between descriptive characteristics and dependent and independent variables was examined with a One-Way Analysis of Variance (ANOVA). According to the analysis results, there

are significant differences between operational information sharing, timeliness, and order processing variables and customers' fundamental expectations from logistics companies.

According to the Tukey test results, for the operational information sharing variable, significant differences were observed between a wide service network and low cost and between a wide service network and service quality among customers' fundamental expectations from logistics companies. When looking at the timeliness variable, significant differences were observed between low-cost and on-time delivery. When looking at the order processing variable, significant differences were observed between low cost and on-time delivery and between service quality and on-time delivery and a wide service network.

There is no significant difference between logistics information technologies and problem-solving variables and customers' reasons for choosing logistics companies. However, there are significant differences between the variable of responsiveness and customers' reasons for choosing logistics companies. According to the Tukey Test results, for the responsiveness variable, significant differences were observed between corporate image and cost, quality service, and delivery time among customers' reasons for choosing logistics companies.

According to the analysis results, there are no significant differences between personnel quality and information quality variables and customers' average monthly logistics shipment quantities. There are only significant differences between the satisfaction variable and customers' average monthly logistics shipment quantities. According to the Tukey test results, for the satisfaction variable, significant differences were observed between 1-5 shipments and 21-25 shipments among customers' average monthly logistics shipment quantities.

According to the results of the hypothesis tests, it was observed that the use of logistics information technologies has a positive effect on all dependent variables except for the perception of personnel quality and information quality. The use of information technologies is considered to reduce customer-personnel interaction, and this result is consistent with other studies. The independent variable of logistics information technologies has a significant effect on timeliness, problem-solving, responsiveness, order processing, satisfaction, and organizational performance variables.

The independent variable of operational information sharing has a positive effect on responsiveness, problem-solving, satisfaction, and organizational performance variables but does not have a significant effect on timeliness and order processing variables.

For businesses, it is essential that the logistics company completes operations on time and minimizes the time between order dispatch and delivery. The "timeliness element" is essential for businesses in terms of preventing additional costs and positively affecting customer satisfaction with the timely delivery of products or services. In today's competitive environment, low-cost, fast, and high-quality service provision is seen as factors that give firms a competitive advantage and positively affect customer loyalty. Logistics, which is one of the many cost items for firms, is crucial for increasing firm profitability. As the results of the analysis show, firms generally adopt a cost-quality service-oriented approach.

Factors such as ease of performing processes in the order processing and ensuring that orders are not delivered to the wrong person can increase the perception of logistics service quality for the receiving business. As the analysis results indicate, businesses prioritize service quality and cost regarding their fundamental expectations. The reason for this is the desire of businesses to keep their costs to a minimum. Businesses also want to keep logistics costs, one of the cost items, to a minimum.

Businesses with a low monthly shipment volume have a higher satisfaction level compared to firms with a higher monthly shipment volume. This is because firms with a higher shipment volume have a higher

probability of experiencing problems. Errors in business processes are fewer in businesses with a low shipment volume compared to businesses with a high shipment volume. As can be seen from the analysis results, businesses with a monthly shipment quantity ranging from 1-5 units are more satisfied with the logistics service provider compared to businesses with a shipment quantity between 21-25 units. The use of logistics information systems contributes to increasing the perceived logistics service quality.

The main definition of logistics is to deliver the right products to the right customers in the right quantity and at the right time. In this case, achieving low cost with high-quality service is an expected and known outcome. Our thesis supports this view. What we primarily focus on is the increasing technological applications in the logistics sector where technology plays a larger role over time and their positive contribution to customer satisfaction and the positive impact on organizations' performance.

Based on the analysis of our thesis, it can be seen that the use of logistics information technologies and operational information sharing has a positive effect on organizational performance. At the same time, companies benefiting from logistics information technologies and operational information sharing generally improve organizational performance, positively affect the company's image, make the company more profitable, and assist in communication with customers, thereby ensuring customer satisfaction.

The rapid development of technology requires companies to keep themselves up to date. In today's world, easy access to services through technology makes it difficult for businesses to ensure customer loyalty. The abundance of service alternatives shows that it is important for businesses to actively and timely benefit from technologies. Logistics information systems provide convenience to businesses in many areas and contribute positively to their organizational performance, differentiating them from other businesses. Providing the requested service at low cost and on time is essential for today's businesses. Proper use of technology will also raise the quality standard of the service provided, thus increasing customer loyalty. While information technologies affect all variables except information quality and personnel quality, operational information sharing affects all variables except timeliness and order processing. What is surprising here is that the perception of satisfaction is higher for businesses with a low shipment volume compared to businesses with a high shipment volume.

This study was conducted based on data obtained from companies engaged in export activities. In future studies, the question of why information technologies do not affect the quality of information and personnel quality should be investigated. Similarly, the question of why operational information sharing does not have an impact on timeliness and order processing should be examined. Research in different sectors can shed light on these issues.

5. DISCUSSIONS

The findings of this study hold practical significance for export-oriented businesses in the Aegean Region and beyond, providing actionable insights on how to enhance logistics service quality and improve organizational performance. The study underscores the importance of operational information sharing in meeting customer expectations. Businesses can enhance their logistics service quality by investing in systems that facilitate real-time information sharing across their supply chains. This can lead to improved visibility, better decision-making, and, ultimately, more satisfied customers.

Responsiveness emerged as a significant factor influencing customers' preferences for logistics companies. Firms should prioritize quick responses to customer inquiries, timely issue resolution, and flexibility in adapting to changing customer needs. Training staff in customer service skills and implementing efficient communication channels can aid in achieving this goal.

The research highlights the positive impact of logistics information technologies on logistics service quality and organizational performance. Companies should consider investing in advanced logistics information systems, such as Warehouse Management Systems (WMS), Transportation Management Systems (TMS), and real-time tracking solutions. These technologies can streamline operations, reduce errors, and improve service delivery.

To meet customer expectations, companies should adopt a customer-centric approach. This involves actively seeking feedback, understanding customer preferences, and tailoring logistics services accordingly. Regular customer surveys and feedback mechanisms can be valuable tools in this regard.
Businesses should aim to build long-term relationships with preferred logistics service providers. The study found that a significant portion of companies had been working with their most preferred logistics companies for several years. Nurturing such relationships can lead to a deeper understanding of each other's needs and more effective collaboration.

Recognizing that logistics service quality is a dynamic aspect of business, companies should focus on continuous improvement. Regularly assess service quality metrics, monitor customer satisfaction levels, and use these insights to refine processes and procedures.

6. LIMITATIONS AND AREAS FOR FUTURE RESEARCH

While this study provides valuable insights, it is essential to acknowledge its limitations and suggest areas for future research:

Sampling Bias: The use of quota sampling may have introduced bias, limiting the generalizability of the findings. Future research could employ more robust sampling methods to obtain a more representative sample of export-oriented businesses.

Response Bias: The study does not delve into potential response biases that may have influenced participant responses. Future research could employ techniques to mitigate response bias and validate findings.

External Factors: The research does not extensively explore the impact of external factors, such as economic conditions or industry-specific trends, on logistics service quality and organizational performance. Future studies could investigate how these external variables interact with the factors studied.

Longitudinal Studies: Longitudinal studies tracking changes in logistics service quality and organizational performance over time could provide deeper insights into the dynamics of these relationships.

Comparative Analysis: Comparative analyses between industries or regions could help identify sector-specific best practices and variations in the impact of logistics information technologies.
Qualitative Research: Complementing quantitative data with qualitative research methods, such as in-depth interviews or focus groups, can provide richer insights into the experiences and perceptions of businesses regarding logistics service quality and technology adoption.

In conclusion, while this study offers practical guidance for businesses aiming to enhance logistics service quality and organizational performance, further research is needed to address its limitations and expand our understanding of these critical aspects of modern supply chain management.

7. CONCLUSION

This study sheds light on the intricate relationship between perceived logistics service quality, technology adoption, and organizational performance in the context of export-oriented businesses in the Aegean

Region. Several key findings emerge from the analysis, offering valuable insights and practical implications for businesses and researchers alike.

Firstly, the study underscores the importance of prioritizing operational information sharing within supply chains. Businesses can enhance their logistics service quality by investing in systems and processes that enable real-time information sharing, leading to improved visibility, more informed decision-making, and, ultimately, greater customer satisfaction. This finding highlights the need for businesses to embrace digital transformation and collaborative technologies to stay competitive in today's dynamic marketplace.

Furthermore, the significance of responsiveness in influencing customers' preferences for logistics companies cannot be overstated. Quick responses to inquiries, timely issue resolution, and adaptability to changing customer needs are essential elements that logistics providers should prioritize. Training personnel in customer service skills and establishing efficient communication channels are critical steps toward achieving this level of responsiveness.

Additionally, the positive impact of logistics information technologies on logistics service quality and organizational performance is a central theme in this research. The study suggests that businesses should consider investing in advanced logistics information systems, such as Warehouse Management Systems (WMS) and Transportation Management Systems (TMS), to streamline operations, reduce errors, and enhance service delivery. Embracing these technologies can contribute significantly to overall business success.

Moreover, the study emphasizes the need for a customer-centric approach. Businesses should actively seek customer feedback, understand their preferences, and tailor logistics services accordingly. Regular surveys and feedback mechanisms can serve as valuable tools for improving customer satisfaction and loyalty.

Building long-term relationships with preferred logistics service providers is another key takeaway. The study reveals that enduring partnerships can lead to a deeper understanding of each other's needs and more effective collaboration, ultimately benefiting both parties.

Finally, the importance of continuous improvement in logistics service quality should not be underestimated. Regular assessment of service quality metrics and monitoring of customer satisfaction levels can help businesses refine their processes and procedures over time.
However, it's essential to acknowledge the limitations of this study, including potential sampling and response biases, as well as the need for future research to explore the impact of external factors and conduct longitudinal and comparative analyses.

In summary, this study provides actionable insights for export-oriented businesses and highlights the pivotal role of technology, customer-centricity, and collaboration in achieving logistics service excellence. As the logistics sector continues to evolve, embracing these findings can position businesses for sustained success, improved customer satisfaction, and enhanced organizational performance.

CRediT AUTHORSHIP CONTRIBUTION STATEMENT

Conceptualization (Selva Staub and Kouroush Jenab): Ideas; formulation or evolution of the general objectives and goals of the research.

Methodology (Selva Staub and Kouroush Jenab): Development or design of the methodology; creation of models.

Validation (Selva Staub and Kouroush Jenab): Verification, either as part of the activity or separately, of the general replicability/reproduction of the results/experiments and other products of the research.

Formal analysis (Selva Staub and Kouroush Jenab): Application of statistical, mathematical, computational or other formal techniques to analyze or synthesize study data.

Research (Selva Staub, Sam Khoury and Kouroush Jenab): Conducting research and research process, specifically performing the experiments, or collecting data/evidence.

Data Curation (Selva Staub): Management activities to annotate (produce metadata), clean data, and maintain research data (including software code, where necessary to interpret the data itself) for initial use and later reuse.

Writing (Selva Staub) - Original Draft: Preparation, authoring, or presentation of published work, specifically writing the initial draft (including substantive translation).

Writing - Review and Editing (Selva Staub, Sam Khoury, and Kouroush Jenab): Preparation, authoring, or presentation of published work by members of the original research group, specifically critical review, commentary, or revision – including pre- or post-publication stages.

Supervision (Selva Staub): Responsibility for oversight and leadership in the planning and execution of research activities, including external mentoring of the core team.

Project Administration (Selva Staub): Responsibility for management and coordination of the planning and execution of the research activity.

DECLARATION OF COMPETING INTEREST

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

DATA AVAILABILITY

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

ACKNOWLEDGMENTS

This study did not receive any specific grant from any funding agency in the public, commercial or not-for-profit sector.

REFERENCES

Aslan, H., Taşçı, H., & Yıldız, B. (2018). The impact of logistics service quality and logistics information technology on logistics and firm performance. *Journal of Current Researches on Social Sciences, 8*(1), 343-358.

Bakan, İ. & Şekkeli, Z. H. (2018). The effect of logistics service quality on customer loyalty: A field study in kahramanmaraş province. *TURAN-SAM International Peer-Reviewed Journal, 10*(40), 123-137.

Başaran, H. (2014). The effect of ınformation systems used in logistics enterprises on customer perception of service and a research. Unpublished Master's Thesis, Naval Sciences and Engineering Institute of Naval War College, Istanbul.

Bıenstock, C. C., Mentzer, J. T., & Bırd, M. M. (1997). Measuring physical distribution service quality. *Journal of the Academy of Marketing Science, 25*, 31-44.

Bowersox, D. J. (2013). Logistical excellence: It's not business as usual. Elsevier.

Bowersox, D., Mentzer, J., & Speh, T. (2008). Logistics leverage. *Journal of Business Strategies, 25*(2), 85-99.

Çağlar, M. B. (2014). The relationship between the use of ınformation technologies in logistics enterprises, customer satisfaction, and business performance: A research. *Journal of Selçuk University Institute of Social Sciences,* 41-55.

Cahyono, Y., Purwoko, D., Koho, I., Setıanı, A., Supendı, S., Setyoko, P., & Wıjoyo, H. (2023). The role of supply chain management practices on competitive advantage and performance of halal agroindustry SMEs. *Uncertain Supply Chain Management, 11*(1), 153-160.

Cash, P., Isaksson, O., Maıer, A., & Summers, J. (2022). Sampling in design research: Eight key considerations. *Design Studies, 78*, 101077.

Cengiz, F. (2006). The effect of logistics ınformation systems on business performance and an application. Unpublished Master's Thesis, Gaziantep University Graduate School of Social Sciences, Gaziantep.

Closs, D. J. & Savıtskıe K. (2003). Internal and external logistics ınformation technology ıntegration. *The International Journal of Logistics Management*, 63-76.

Closs, D. J. & XU, K. (2000). Logistics ınformation technology practice in manufacturing and merchandising firms–an ınternational benchmarking study versus world class logistics firms. *International Journal of Physical Distribution and Logistics Management, 30*(10), 869-886.

Çekerol, G. S. (2013). Logistics Management. Anadolu University Publication No: 2823, Eskişehir.

Doğanay, A., Ataızı, M., Şımşek, A., Salı, J. B., & Akbulut, Y. (2012). Research methods in social sciences. Printing place: Anadolu University.

Ertek, G. & Aba, B. (2013). A classification (taxonomy) for logistics ınformation systems. *Logistics*, 27-31.

Feng, Y. X., Zheng, B., & Tan, J. R. (2007). Exploratory study of logistics service quality scale based on online shopping malls. *Journal of Zhejiang University-SCIENCE A, 8*(6), 926-931.

Fu, Q., Abdul Rahman, A. A., Jıang, H., Abbas, J., & Comıte, U. (2022). Sustainable supply chain and business performance: The impact of strategy, network design, information systems, and organizational structure. *Sustainability, 14*(3), 1080.

Gıl Saura, I., Servera Frances, D., Berenguer Contrı, G., & Fuentes Blasco, M. (2008). Logistics service quality: A new way to loyalty. *Industrial management & data systems, 108*(5), 650-668.

Grönroos, C. (1984). A service quality model and its marketing ımplications. *European Journal of Marketing, 18*(4), 36-44.

Gürbüz, S. & Şahin, F. (2016) Research methods in social sciences (3rd ed.), Ankara, Seçkin Publishing.

Hırlak, B., Taşlıyan, M., Güler, B., & Ceyhan, Y. (2017). Relationships between perceived service quality, customer satisfaction, customer loyalty, and some socio-demographic variables. *Social Sciences Studies Journal (SSSJournal), 3*(2), 121.

Karadeniz, M. & Başaran, B. (2014). Investigation of the effect of ınformation systems used in logistics enterprises on customers' perception of service. *Journal of Management Sciences, 12*(24), 239-273.

Lee, K., Romzı, P., Hanaysha, J., Alzoubı, H., & Alshurıdeh, M. (2022). Investigating the impact of benefits and challenges of IoT adoption on supply chain performance and organizational performance: An empirical study in Malaysia. *Uncertain Supply Chain Management, 10*(2), 537-550.

Long, D. (2016) International logistics: Global supply chain management, (Translated by: M. Tanyaş, M. Düzgün), Ankara, Nobel Academic Publishing.

Maaz, M. A. M., & Ahmad, R. (2022). Impact of supply chain performance on organizational performance mediated by customer satisfaction: A study of dairy industry. *Business Process Management Journal, 28*(1), 1-22.

Mentzer, J. T., Flınt, D. J., & Kent, J. L. (1999). Developing a logistics service quality scale. *Journal of Business logistics, 20*(1).

Mentzer, J. T., Gomes, R., & Krapfel, R. E. (1989). Physical distribution service: A fundamental marketing concept? *Journal of the Academy of Marketing Science, 17*, 53-62.

Olah, J., Karmazın, G., Pető, K., & Popp, J. (2018). Information technology developments of logistics service providers in Hungary. *International Journal of Logistics Research and Applications, 21*(3), 332-344.

Onay, M. & Kara, H. S. (2009). Effects of logistics outsourcing practices on organizational performance. *Aegean Academic Perspective Journal*, 593-622.

Özdemir, L. & Dulkadir, B. (2017). The effect of ınformation technology functions on organizational performance. *Journal of Management Sciences, 15*(29), 25-41.

Parasuraman, A. B. L. L., Zeıthaml, V. A., & Berry, L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing, 64*(1), 12-40.

Rafıq, M. & Jaafar H. (2007). Measuring customers' perceptions of logistics service quality of 3pl service providers. *Journal of Business Logistics, 28*(2), 159-175.

Rahman, M. M., Tabash, M. I., Salamzadeh, A., Abdulı, S., & Rahaman, M. S. (2022). Sampling techniques (probability) for quantitative social science researchers: A conceptual guidelines with examples. *Seeu Review, 17*(1), 42-51.

Ramanathan, R., Ramanathan, U., & Ko, L. W. L. (2014). Adoption of RFID technologies in UK logistics: Moderating roles of size, barcode experience and government support. *Expert Systems with Applications, 41*(1), 230-236.

Savıtskıe, K. (2007). Internal and external logistics ınformation technologies: the performance ımpact in an ınternational setting. *International Journal of Physical Distribution & Logistics Management, 37*(6), 454-468.

Tekın, M., Zerenler, M., & Bılge, A. (2005). Effects of the use of ınformation technologies on business performance: an application in the logistics sector. *Istanbul Commerce University Journal of Science, 4*(8), 115-129.

Thai, V. V. (2013). Logistics service quality: Conceptual model and empirical evidence. *International Journal of Logistics Research and Applications, 16*(2), 114-131.

Tosunoğlu, N. & Yücel-Toy, B. (2007). Scientific research process, statistical techniques, and errors made in research in social sciences field. *Journal of Faculty of Commerce and Tourism Education, 1*(1), 1-20.