i-RIC 2024

INTERNATIONAL RESEARCH & INNOVATION CONFERENCE

PROCEEDING

"HARMONY IN DIVERsITY: FOsTERING UNITY
SUsTAINABLE REsEARCH AND INNOVATION SOCIETY"

24 & 25 JULY

2024

Organizer

ULBI Universitas Logistik & Bisnis Internasional

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PREFACE

It is a great privilege for us to present the proceedings of the International Research and Innovation Conference (i-RIC 2024) to the authors and delegates. We hope that you will find it useful, exciting, and inspiring. The International Research and Innovation Conference (i-RIC 2024) was held online from 24 to 25 July 2024, organized by Politeknik Nilai in collaboration with Universitas Logistik dan Bisnis Internasional (ULBI) with the theme, "Harmony in Diversity: Fostering Unity Sustainable Research and Innovation Society."

i-RIC 2024 aims to gather more researchers, students, government agencies, and private sectors in an event with a larger international impact. The organization of this program also serves as a platform for sharing research findings, ideas, and knowledge among members of polytechnics, community colleges, higher education institutions, public universities, as well as government and private agencies involved. Researchers, academics, and experts from various sectors will have a global stage at i-RIC 2024 to discuss the latest findings and research that support sustainable development goals. The conference aims to generate knowledge to make our world greener and better for us and our future generations.

There were 4 keynote speeches covering different areas of the conference. The first day started with Associate Professor Dr. Ir. Agus Purnomo (ULBI Indonesia) talk on "How to Boost Green Supply Chain Resilience?" and Professor Dr. Mohamed Kchaou (University of Bisha, Saudi Arabia; University of Sfax, Tunisia) on "Latex Based Membrane for Oily Wastewater Treatment Technology Process and Perspectives". The second day featured Professor Dr. Recai Kus (Selcuk University, Turkey) on "Load Optimization of AISI 1040 and AISI 5140 Joint" and Dr. Umawathy a/p Technamurthy (Universiti Kebangsaan Malaysia) with her talk on "Harnessing the Potential of Maker Education in Enhancing Student Learning Outcomes".

A total of 124 presenters participated in the parallel presentation sessions, which ran smoothly over the two-day event supported by 109 i-RIC 2024 organizing committees. This included 16 online presentation moderators, 42 reviewers, 19 judges, and all participants who took the time to attend the online sessions. A total of 124 research papers and 56 innovations were presented in this program across 7 fields, namely:

A. Engineering and Technology
B. Business Management
C. Education, Teaching, and Learning
D. Health and Life Sciences
E. Social Sciences
F. Information Communication Technology
G. Logistics and Supply Chain

Information regarding i-RIC 2024 can be accessed through the Program Book at https://heyzine.com/flip-book/521619ef82.html and overall results can be found at http://iric.polinilai.edu.my/.../confe.../results-innovation.

We would like to express our heartfelt thanks and sincere appreciation to all the authors for their contributions to this publication. We also express our gratitude and appreciation to all of the reviewers for their constructive feedback on the papers. Warmest thanks to the members of the organizing committee for their hard work and dedication in ensuring the success of the event.

Congratulations to everyone involved in making this conference a success.

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LOGISTICS AND SUPPLY CHAIN MANAGEMENT

"HARMONY IN DIVERsITY: FOsTERING UNITY
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Integrating Advance Technology and Logistics Customer Service for Optimal Logistics Performance: A Study at Shopee Express Pangalengan Branch

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Abstract

The expansion of e-commerce has elevated the importance of package tracking and delivery for logistics companies, which now combined with cutting-edge technology with customer-focused services. This study examines the integration of Advance Technology (AT) and Logistics Customer Service (LCS) to optimize Logistics Performance (LP) at Shopee Express Pangalengan Branch. This research employed an explanatory cross-sectional survey approach, gathering data through questionnaires administered to 96 Shopee Express users located in Pangalengan. The study utilized Partial Least Squares Structural Equation Modeling (PLS-SEM) for data analysis. Findings revealed that both Advanced Technology and Logistics Customer Service significantly and positively impact logistics performance. Advance technology contributes through improved operational efficiency and shipment visibility, while Logistics Customer Service improves customer satisfaction and loyalty. The findings confirm the importance of integrating advanced technology and superior customer service in e-commerce logistics strategies. Practical implications include recommendations for continued investment in technology and improved customer service quality that enable e- commerce logistics companies to optimize their performance in the digital age.

Keywords: Advance Technology, Logistics Customer Service, Logistics Performance, E-commerce Logistics, PLS-SEM.

1. Introduction

The era of globalization has increased competition in various sectors, including the logistics industry. Companies continue to look for strategies to improve their logistics performance by utilizing Advance Technology (AT) and improving customer service (Lisawanto et al., 2023). Effective logistics operations are crucial for managing supply chains and have emerged as a critical factor in determining an organization's success (L. Zhang, 2018). This includes various aspects, such as on-time delivery, cost effectiveness, and customer satisfaction, all of which contribute to operational efficiency and overall competitiveness.

The logistics industry has witnessed a significant transformation in recent years, driven by the growing demand for efficient and customer-centric services (Perenc, 2018). Along with the growth of the e-commerce sector, long-distance delivery has become a critical component in the supply chain, thus posing a challenge for logistics service providers to meet evolving customer expectations (Vakulenko et al., 2019). Logistics firms are now prioritizing the combination of Advanced Technology and enhanced customer service approaches to overcome these obstacles and boost their overall logistics performance (LP).

Advance technology has emerged as a significant driver for improving logistics performance. The application of technologies such as the Internet of Things (IoT), big data

analytics, and automation has revolutionized supply chain operations (Hercegová et al., 2021). These technologies facilitate real-time tracking, predictive maintenance, and optimized routing, leading to increased efficiency, reduced costs, and better decision-making (Scherbakov & Silkina, 2019). In addition, the integration of Advance Technology can streamline the flow of information, enabling smooth coordination among supply chain partners (Duan, 2020). In addition to technological advancements, Logistics Customer Service (LCS) has gained prominence as an important factor affecting logistics performance (LP). Meeting customer expectations and providing exceptional service has become imperative to maintain a competitive advantage (Ghoumrassi & Țigu, 2017). Effective communication, responsiveness to customer queries, and personalized solutions can increase customer satisfaction and loyalty, ultimately driving logistics performance.

This research examines the integration of Advance Technology (AT) and Logistics Customer Service (LCS) at Shopee Express, one of the leading logistics service providers in Indonesia. This research investigates the impact of digitalization on customer satisfaction, as well as the strategies used by Shopee Express to improve its logistics performance (LP) through technological innovation and a customer experience-centered approach. Shopee Express currently utilizes AT, especially the real-time tracking system. This unique feature allows customers to see the live location of the vehicle distributing their packages. Additionally, the system seamlessly transitions from showing delivery trucks to motorcycles during the long-distance delivery phase, all within the same Shopee app. This level of detailed tracking surpasses the capabilities of many other logistics providers in Indonesia, which usually rely on descriptive text updates to show the location of the package.

In addition, Shopee Express has integrated customer service features powered by AI. One notable application is the AI's ability to accurately estimate package arrival time. In addition, Shopee Express offers a customer-centric guarantee: if the parcel arrives later than the promised delivery time (as determined by Shopee and Shopee Express), customers automatically receive compensation in the form of Shopee Pay credit added to their account balance.These technological advancements and LCS innovations put Shopee Express at the forefront of e-commerce logistics in Indonesia, offering a level of transparency and reliability that enhances the overall customer experience. The integration of real-time tracking, AI- powered forecasting, and customer assurance demonstrates Shopee Express' commitment in utilizing AT to improve LP and customer satisfaction.

The integration of AT and customer-centric strategies has emerged as an important approach for logistics providers to meet the growing demands of the e-commerce industry. By leveraging technological innovations and focusing on improving customer experience, Shopee Express Branch Pangalengan aims to optimize LP and maintain a competitive edge in the market. Despite an expanding field of research, there remains a gap in fully comprehending how Advanced Technology (AT) and Logistics Customer Service (LCS) can be effectively combined to maximize Logistics Performance (LP). Previous research has mostly focused on these factors individually or examined their effects within a specific context or industry (Cano et al., 2021). This research seeks to examine how Advanced Technology (AT) and Logistics Customer Service (LCS) impact Logistics Performance (LP), with the goal of offering useful findings for both industry professionals and academic researchers.

This research offers novelty in exploring the integration of AT and LCS to optimize LP from the customer perspective in the context of e-commerce in Pangalengan. This research is

unique in that it locates customer experiences and perceptions focusing on non-urban settlements. By focusing on Shopee Express in Pangalengan, this study provides valuable insights into how customers perceive and evaluate the implementation of advanced logistics technology in their daily e-commerce services. In addition, this study contributes to the development of a conceptual model that describes the relationship between AT, LCS and LP based on customers' perspectives in an e-commerce context. This approach enables a deeper understanding of how AT and LCS directly affect LP in the e-commerce logistics process.

2. Literature Review

The Role of Advance Technology in Achieving Logistics Performance

A country's level of digitization plays an important role in the formation and development of its logistics performance. Advance technology, especially with regard to digital connectivity and the integration of digital technology into business processes, significantly improves various aspects of logistics performance at the country level. It was found that specific indicators such as fixed broadband coverage, 4G coverage, broadband price index, ICT specialists, professional social media usage, big data, and cross-border e-commerce have a significant influence on various aspects of LP (Moldabekova et al., 2021). Based on the findings of this study, the application of technology in logistics management provides several significant benefits. These technologies contribute to lower overall costs, improved cooperation between suppliers and customers, and increased visibility and traceability of products and information. In addition, technology also plays an important role in supporting the decision-making process throughout the supply chain, including for the end consumer (Cano et al., 2021).

Internet of Things (IoT) technology and Blockchain technology (BCT) have a positive impact on the level of transparency in humanitarian logistics operations. This research provides a new understanding of how AT such as IoT and BCT can improve Humanitarian LP by increasing the level of transparency, public trust, and coordination between all parties involved in humanitarian aid operations (Khan et al., 2021). Several key technologies from Industry 4.0 such as Internet of Things (IoT), Cyber-Physical Systems (CPS), Big Data Analytics, Artificial Intelligence (AI), Cloud Technologies, Blockchain, and Autonomous Robots act as key factors in improving sustainable LP through increased digitization, connectivity, intelligence, integration, and operational responsiveness. However, the application of these technologies requires careful consideration of trade-offs between various aspects of economic, environmental, and social sustainability in order to achieve an optimal balance in their implementation (Sun et al., 2022).

The technologies discussed in this section are useful for updating logistics education materials, improving teacher performance, showing the balance between traditional and disruptive technologies, and illustrating the relationship between the two (Cano et al., 2021).

1) Global Positioning System and General Packet Radio Service
   GPS is a positioning technology that is effective in all weather conditions. This technology provides high accuracy and fast response to determine the location of vehicles or goods in the supply chain (Hussien et al., 2023). Meanwhile, GPRS is a GSM network-based communication technology that offers the advantage of higher data transmission speeds. The combination of GPS and GPRS is often applied in alarm systems and position monitoring of cargo vehicles (Cano et al., 2021). When combined with technologies such as RFID, these technologies enable smarter and more dynamic logistics systems for product collection and delivery, as RFID records product information. These technologies are key

enablers of IoT and enable real-time tracking of the location of each transportation unit (Naumova et al., 2020).

2) Internet of Things
This technology connects everyday objects and products to the internet, allowing them to send and receive data. IoT is based on self-configuring infrastructure using standardized and interoperable communication protocols, where physical and virtual objects have identities as well as physical attributes, and are integrated into information networks through intelligent interfaces. In logistics, IoT technology connects various assets throughout the supply chain. The data generated from these connections provides real-time visibility of operations and creates new sources of value. IoT solutions for logistics integrate sensors with RFID and GPS to provide real-time monitoring of products, ensuring that products arrive in the condition expected by customers (Chuang et al., 2017).

3) Artificial Intelligence
According to this study, Artificial Intelligence (AI) is crucial in enhancing last-mile delivery logistics. AI is implemented in various critical areas to boost efficiency and cut delivery expenses. One key application is Vehicle Routing Optimization (VRO), which employs AI algorithms to determine the most efficient delivery paths, thereby reducing travel distances and transportation costs. Last Mile Platform (LaMP) utilizes AI to automate courier routes by considering various factors such as delivery destination, traffic conditions, and weather in real-time (Jucha, 2021). In the research (Shaklab et al., 2023) mentioned that this Journal describes the comprehensive application of AI in last mile delivery logistics, focusing on robot-based autonomous delivery systems. AI is leveraged to optimize routes and delivery schedules through sophisticated Vehicle Routing Problem (VRP) models, considering travel time uncertainty and customer time preferences. Safety is top of mind with the use of recurrent neural networks to predict pedestrian movements, vibration monitoring systems for package security, and automated loading and unloading mechanisms for contactless delivery. Delivery robots are equipped with intelligent navigation capabilities, allowing them to operate autonomously in complex urban environments. This multifaceted approach demonstrates how AI can improve efficiency, safety, and customer satisfaction in last mile logistics, while addressing real-world operational challenges.

The application of AI in logistics, especially last mile delivery (LMD), has brought significant changes to the industry. AI enables more accurate data-driven decision- making, by analyzing various factors such as consumer patterns, traffic conditions, and driver performance. AI systems can dynamically optimize delivery routes and scheduling, improving overall operational efficiency. AI integration in logistics systems enables real-time data sharing across the supply chain, improving coordination and responsiveness. AI-powered digital services, such as real-time tracking and intelligent scheduling, improve customer experience. AI also plays an important role in demand forecasting and predictive maintenance, helping companies anticipate future needs and reduce downtime. The implementation of AI in Last Mile Delivery (LMD) enhances the overall delivery process, making it more efficient, adaptable, and focused on customer needs. This provides a competitive edge for businesses that embrace AI technology, helping them tackle the increasing challenges posed by the expanding e-commerce sector (Sorooshian et al., 2022).

H1: Advance Technology has a positive and direct effect on Logistics Performance

The Role of Logistics Customer Service in Achieving Logistics Performance

The role of LCS plays vital part in Logistics Performance. This research shows that a focus on written shipping policies, organizational structure, order cycle time, inventory availability, and customer complaint handling significantly contribute to improved LP. The new findings from this research highlight the importance of tailoring LCS elements to industry-specific needs, especially in the context of freight forwarding, and emphasize the importance of after-sales service in achieving customer satisfaction and optimal LP (Purwoko et al., 2022).

The main factors of LCS that affect LP include delivery speed, flexibility of delivery time/place, clarity of return procedures, and delivery price. The higher the quality of LCS, the better LP can be achieved. The main findings of the study (Majchrzak-Lepczyk & Łupicka, 2019) are:

1. Non-price factors in LCS, such as speed and flexibility of delivery and clarity of return procedures, are now favored by consumers over price.
2. The increased use of mobile devices for online shopping has driven consumer expectations of faster delivery.
3. Consumer awareness of the right to return goods is increasing, making clarity of return procedures an important factor.
4. In some European countries, such as Poland, consumers are willing to pay more for faster delivery services.

This research reveals that non-price factors in Logistics Customer Service play an increasingly important role in determining the LP of e-commerce companies, with preferences varying across different European countries. These findings provide new insights into the importance of adapting LCS strategies according to the specific needs of each country's market to improve the competitiveness of e-commerce companies (Majchrzak-Lepczyk & Łupicka, 2019).

H2: Logistics Customer Service has a positive and direct effect on Logistics Performance

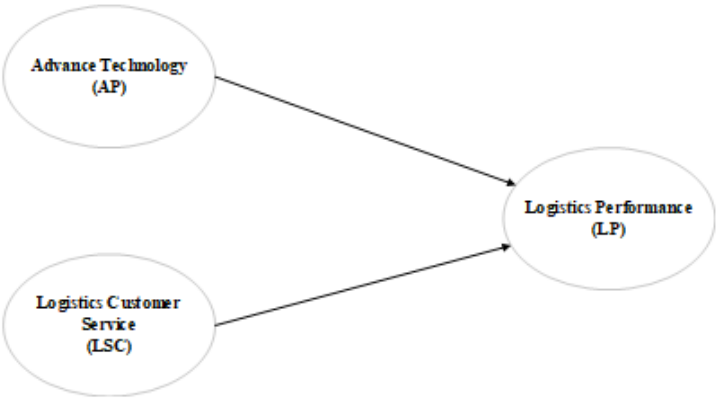

Figure 1: Theoretical Framework

3. Methodology

Research Design

Explanatory research methods, also known as causal or verification research, aim to uncover cause-and-effect relationships between variables. This approach seeks to identify and verify how a phenomenon changes or varies in relation to other variables. In addition, explanatory research also serves to test theories or hypotheses, which may strengthen or refute pre-existing theories. The explanatory survey method is specifically used to analyze the effect of independent variables on dependent variables. This research design involves hypothesis testing through relevant statistical analysis techniques. The choice of this method is based on its ability to explain the causal relationship and test the effect of the independent variable (X) on the dependent variable (Y) (Sari et al., 2022).

Cross-sectional research design is a method that studies the relationship between risk factors and their effects through observation at a single point in time. Unlike longitudinal research which requires a long period of time, cross-sectional aims to collect data simultaneously or in one short period of time. In the context of this research, the cross-sectional survey method was applied to collect data from customers of Shopee Express Pangalengan branch. Data collection is carried out through distributing questionnaires to respondents in a relatively short period of time and simultaneously (Abduh et al., 2022).

Data Source and Sampling Techniques

Prior to initiating the survey, researchers developed a 25-item questionnaire. This survey instrument employed a five-point semantic differential scale and was structured around the three variables outlined in the conceptual research model. To ensure respondents' comprehension, the questionnaire was translated into Indonesian. An online survey was conducted with 100 Shopee Express customers in Pangalengan, Bandung Regency, West Java, Indonesia. This region was chosen due to the high activity of Shopee Express in non-urban areas. The respondents were users of the Shopee Express service, selected based on their experience regarding the variables under study. From the 100 surveys sent out, 96 responses were considered valid and suitable for inclusion in the subsequent analysis.

The research employed Variance-based Partial Least Squares Structural Equation Modeling (PLS-SEM) to analyze the data and investigate relationships among variables. SmartPLS 3.0 software was utilized to assess the measurement model, confirming the construct variables' validity and reliability. Despite the non-normal distribution of data, the conceptual model was validated through PLS-SEM application (Hair et al., 2021).

4. Results

The PLS-SEM method was applied to evaluate the research model, which consists of two aspects: internal and external models. In the external model assessment, validity and reliability are the main focus. Convergent validity using a factor loading threshold of 0.7 and an average variance extracted (AVE) value of at least 0.5. The Fornell-Lacker criterion was employed to test discriminant validity, requiring the correlation between latent constructs to surpass the square root of the AVE.

Model reliability was assessed through composite reliability and Cronbach's alpha, both needing to meet a minimum value of 0.70. The internal model evaluation, aimed at predicting relationships between latent variables, utilized T-statistic values, P-values, and R-squared. According to Hair et al. (2021), R-squared values of 0.75, 0.5, and 0.25 denote strong, moderate, and weak influences of exogenous factors on endogenous variables, respectively. The significance of variable relationships at the 5% level was determined by a t-value exceeding 1.65 and a P-value below 0.05.

Outer Structural Model Result

Table 1 data indicates that all indicators satisfy convergent validity requirements, with factor loading values of 0.7 or higher and AVE values of 0.5 or above. These findings are crucial in assessing the outer model. Table 2 demonstrates compliance with discriminant validity criteria, as the square root of AVE (Fornell-Lacker Criterion) exceeds the correlation between latent constructs. Additionally, the model exhibits Composite Reliability and Cronbach's Alpha values of 0.70 or greater, verifying that it meets the necessary reliability standards.

Table 1: Assessment of Variable Validity and Reliability

Var	Ind	FL	Crb_α	Cps_Re	AV_E
Advance Technology (AT)			**.922**	**.938**	**.685**
T1	location tracking accuracy	.809			
T2	speed of information	.898			
T3	real-time monitoring	.761			
T4	efficiency improvement	.735			
T5	predicted delivery time	.864			
T6	delivery route optimization	.758			
T7	customer satisfaction	.947			
Logistics Customer Service (LCS)			**.962**	**.968**	**.732**
S1	policy clarity	.966			
S2	policy transparency	.783			
S3	warranty availability	.817			
S4	ease of warranty claims	.771			
S5	speed of warranty claim settlement	.869			
S6	packaging quality	.769			
S7	packaging safety	.773			
S8	ease of claim process	.965			
S9	speed of claims handling	.969			
S10	ease of return process	.843			
S11	Return processing speed	.851			
Logistics Performance (LP)			**.911**	**.929**	**.652**
P1	Delivery time	.796			
P2	Shipping cost	.807			
P3	Speed of delivery time	.753			
P4	Customer satisfaction	.859			
P5	Problem solving	.841			
P6	Service uniqueness	.744			
P7	Service flexibility	.843			

Var = Variables, Ind = Indicators; FL = Factor Loading; Crb_α = Cronbach's alpha; Cps_Re = Composite Reliability; AV_E = AVE

Table 2: Fornell-Larcker Criterion (Discriminant Validity)

	AT	LCS	LP
AT	.828		
LCS	.483	.856	
LP	.710	.687	.807

Inner Structural Model Result

Internal model assessment involves examining three parameters: R-squared (coefficient of determination), T-statistic value, and P-value. Data presented in Table 3 shows an R-Squared value greater than 0.5. This suggests that the exogenous variables, AT and LCS, exert a moderately significant influence on the endogenous variable, LP.

Table 3: R-Square (Determinant Coefficient)

	R. Squ	R. Sq Ad
LP	.658	.651

R_Squ = R Square; R_Sq_Ad = R Square Adjusted

Significance of variable relationships at the 5% level is determined using the criteria of T-value exceeding 1.65 and P-value less than 0.05. Comparing Table 4 and Figure 2 reveals that all hypotheses are supported, demonstrating positive direct relationships.

Table 4: Summary of Hypothesis Test Results for All Proposed Research Hypotheses

Hypothesis	β. Pc	O. S	SD	T_Stc	P_VL	Hy_T.Co
Hpt1:AT → LP	.493	.493	.093	5.273	.000	Accepted
Hyp2: LCS → LP	.449	.449	.084	5.336	.000	Accepted

Hpt = Hypothesis; β. Pc = Path Coefficients O. S = Original Sample; SD = Standard Deviation; T_Sc = T Statistics; P_VL = P Value; Hy.T.Co = Hypothesis Testing Conclusion

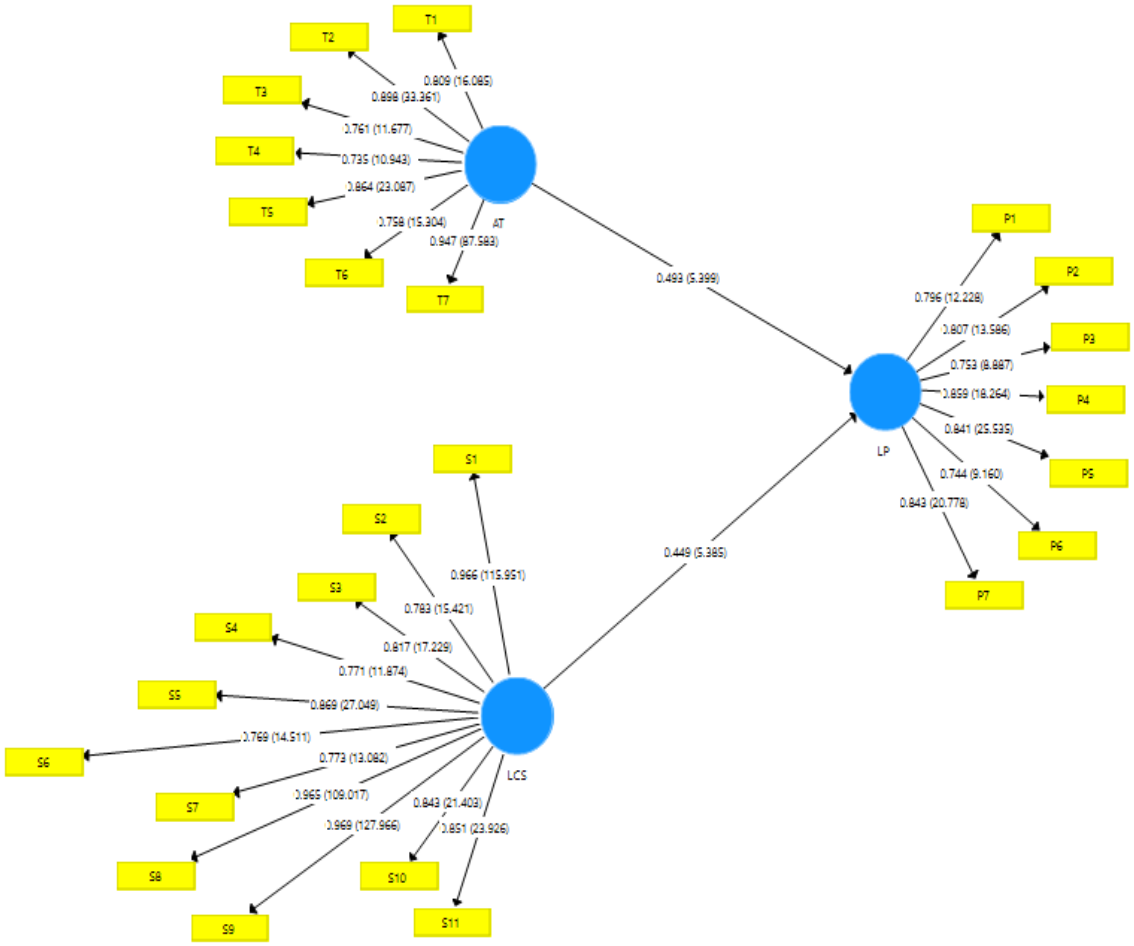

Figure 2: Overview of the Model Based on Bootstrap Analysis: Path Coefficients, Factor Loadings, and T-Statistics

5. Discussion

This study explores how Advanced Technology (AT) and Logistics Customer Service (LCS) combined to optimize Logistics Performance at Shopee Express Pangalengan Branch. In addition, this research also analyzes the impact that AT and LCS have on LP.

Findings from H1 indicate that Advanced Technology (AT) directly and positively influences Logistics Performance (LP). Advanced Technology encompasses cutting-edge tools used in logistics operations, such as warehouse management systems, real-time tracking capabilities, and predictive analytics. This in turn enables companies to achieve optimal LP (Y. Zhang et al., 2017). Practically speaking, companies that adopt AT tend to achieve higher operational efficiency, reduce errors, and increase delivery speed. This improves their productivity, strengthens service reliability, and meets customer expectations for fast and accurate delivery, thereby creating a significant competitive advantage (Wang et al., 2019). In this context, AT value stems from its capacity to enhance real-time tracking systems and increase the transparency of

item-specific tracking data. Consequently, the impact of AT on LP is both practically significant and well-supported by theoretical frameworks in operations and logistics management research.

The findings from H2 corroborate the notion that Logistics Customer Service directly and positively influences Logistics Performance. Organizations that implement superior LCS practices demonstrate a higher ability to meet customer needs, handle complaints effectively, and increase overall customer satisfaction (Gligor et al., 2019). This customer-focused approach not only helps build customer loyalty but also contributes to improved operational efficiency through constructive customer feedback (Yu et al., 2017). From a strategic point of view, excellence in LCS allows companies to differentiate themselves from competitors and build a strong reputation in a highly competitive market (Purnama et al., 2024). In addition, organizations that successfully integrate superior customer service into their logistics operations often experience increased market share, higher customer retention, and sustained revenue growth (Lestari & Harto, 2024). As a result, superior LCS drives improvements in overall LP, including reduced delivery times, increased order accuracy, and decreased return rates (Burity, 2021). Therefore, by placing customer satisfaction as a top priority in logistics operations, companies can build a strong foundation for optimal and sustainable LP.

The recommendations from this study are as follows: First, it is recommended that Shopee Express Pangalengan Branch maintain its investment in Advanced Technology. This should be done not only to enhance operational efficiency but also as a strategic approach to gain a competitive edge and establish market dominance in the e-commerce logistics sector. Secondly, the company is advised to enhance the quality of their Logistics Customer Service, as empirical evidence shows it directly boosts Logistics Performance. By striking a balance between technological innovation and exceptional customer service, the company can reinforce its market standing while fostering long-term growth. This strategy also enables quick adaptation to evolving customer needs and market trends, ultimately leading to stronger customer loyalty and business growth. Third, seamless integration between AT and LCS is highly recommended, as this not only improves overall LP, but also drives innovation in logistics business models. This strategy enables companies to create more personalized and responsive logistics solutions, exceeding customer expectations in terms of service speed, accuracy and convenience. Fourth, to further strengthen LP, it is recommended to periodically analyze customer data and operational feedback to identify areas of improvement and opportunities for innovation. Finally, cultivating an organizational culture that emphasizes both technological advancement and outstanding customer service across all hierarchical levels can substantially enhance LP and nurture enduring customer relationships.

6. Conclusion and Implications

This research reveals the direct impact of Advanced Technology (AT) and Logistics Customer Service (LCS) on Logistics Performance (LP) at Shopee Express Pangalengan Branch. Advance Technology, which includes GPS, AI, and IoT, not only improves operational efficiency directly but also contributes to the overall improvement of Logistics Performance. In addition, superior Logistics Customer Service also plays an important role in improving customer satisfaction and operational effectiveness, thus improving logistics performance. The integration of Advance Technology and quality customer service into the logistics strategy is essential to achieve long-term operational excellence and gain a competitive edge in the highly dynamic e-commerce market.

The practical implications of this study's findings for e-commerce logistics management are as follows: First, organizations can enhance their ability to respond to market demands and

meet customer expectations by prioritizing the implementation of Advanced Technology such as GPS for real-time tracking, AI for route optimization, and IoT for real-time customer feedback system. Second, by understanding the importance of excellent Logistics Customer Service in achieving optimal Logistics Performance, companies can develop comprehensive training programs for customer service staff and implement more sophisticated customer relationship management systems. This includes activities ranging from order handling to customer complaint resolution. By integrating Advance Technology and superior customer service, companies can improve operational efficiency, reduce shipping errors, and strengthen customer loyalty.

However, it should be noted that this research has some limitations. For example, this research focuses on Shopee Express Pangalengan branch, which does not fully represent the dynamics of e-commerce logistics in other regions or a larger scale. Future research could broaden the geographical scope to explore regional differences in technology adoption and customer service approaches. Additionally, they should consider variables such as logistics competitive advantages, organizational culture, and other factors that may impact logistics performance, which were not addressed in this study. Moreover, upcoming research should take into account external factors that could influence technological advancements in last-mile delivery, shifts in government policies, and competitive dynamics within the e-commerce sector. Incorporating additional variables and indicators into the analysis would provide a more comprehensive understanding of the factors affecting logistics performance in the broader e-commerce landscape.

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