DINASTI INTERNATIONAL JOURNAL OF MANAGEMENT SCIENCE (DIJMS)
E-ISSN : 2686-522X
P-ISSN : 2686-5211
https://dinastipub.org/DIJMS dinasti.info@gmail.com +62 811 7404 455

DOI: https://doi.org/10.31933/dijms.v5i5
Received: 03 June 2024, **Revised:** 08 June 2024, **Publish:** 23 June 2024

ANALYSIS LOGISTICS INFORMATION SYSTEMS AND WAITING LINE METHODS ON LION PARCEL CUSTOMER SATISFACTION DURING COVID-19 (2020-2021)

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Abstract: This study assesses customer satisfaction with Lion Parcel during the 2020-2021 COVID-19 period, noting a substantial surge in orders during the pandemic and peak seasons. The research explores the potential of a Logistics Information System as a broader communication network for companies to send and receive information. Additionally, it employs the Waiting Line Method to address customer queue service issues. The study, involving 100 respondents categorized by gender, age, and occupation, utilizes quantitative methods with SmartPLS version 4.0. The analysis reveals that the Average Variance Extracted (AVE) values for the Logistics Information System (X_1), Waiting Line Method (X_2), and Customer Satisfaction (Y) exceed the 0.5 threshold, with values of 0.693, 0.625, and 0.829, respectively. The R-Square value of 0.711 suggests that all exogenous latent constructs collectively influence Customer Satisfaction (Y) by 71% in this study and 29% were influenced by other factors.

Keywords: Logistic Information System, Waiting Line Method, Customer Satisfaction, Covid-19 pandemic

INTRODUCTION

Customer satisfaction has become the main focus for many companies in various industrial sectors. Research on customer satisfaction is an important step to understanding how companies can improve their services, retain existing customers, and attract new customers. During this time, customer satisfaction has become an important performance indicator for many companies. However, customer satisfaction conditions can be influenced by various factors, one of which is external factors, namely the Covid-19 pandemic.

During the Covid-19 pandemic, customer satisfaction conditions in many industrial sectors experienced significant changes. The pandemic has forced many companies to change the way they operate, such as reducing physical contact, dealing with disrupted supplies, and

adapting their services to changing customer needs. Therefore, it is important to understand how this pandemic has affected customer satisfaction, whether it has been the same, decreased, or even increased during this time.

Apart from that, the role of waiting line methods and logistics information systems is also very important in this context. An efficient queuing system and good logistics information system can contribute significantly to increasing customer satisfaction. A good waiting line method can reduce customer waiting time, while an efficient information logistics system can ensure products or services are available on time.

To ensure customer safety while using services, companies must maintain and manage their facilities well. Lion Parcel, one of the many freight forwarding companies, continues to compete with many expedition companies in the current era in order to survive and win in a market that prioritizes maximizing profits. (Afghani & Yulianti, 2017)

Logistics Information Systems (SIL) refers to the use of information technology to manage and coordinate various logistics activities within an organization. In the context of Lion Parcel, SIL is a framework that integrates order receipt, delivery management, route scheduling, and delivery status monitoring. SIL not only provides real-time operational information, but can also provide strategic insights that support decision making in logistics aspects

LITERATURE REVIEW

Logistic Informatiom System

Logistics is the science or activities related to planning, organizing, directing and controlling in order to obtain, store, move and distribute goods and services from sources to consumers Dr. Ir. Suntoro (2020).

A system is a collection of elements and components that mutually influence each other, so that a goal can be achieved ((Sulistyaningsih, Transportasi, Logistik, & Trisakti, 2018)

Information systems are a combination of information technology and the activities of people who use that technology to support operations and management. In a very broad sense, the term information system is often used to refer to interactions between people, data, algorithmic processes, and technology. Information systems can also be interpreted as an organized combination of humans, software, hardware, communication networks and data sources in collecting, changing and disseminating information within an organization.Firmansyah & Hafidudin (2019).

A logistics information system is a wider communication network within an organization or company that must be prepared to create or send and be able to receive information submitted by the organization or company. There are efforts made to collect, strengthen and utilize company or organization data as a basis for company strategy in making decisions that can be useful for the company or organization itself. (Nuryanto & Hidayana, 2021)

An efficient logistics information system can also help companies plan and manage inventory needs more accurately, thereby reducing the risk of stock shortages or excesses that can disrupt the distribution of logistics needs.

The Logistics Information System at PT Lion Parcel involves various components, such as delivery tracking systems, inventory management, and internal communications. Good integration between these systems enables the Company. Logistics Information Systems (LIS) refer to the use of information technology to manage and coordinate various logistics activities within an organization. In the context of Lion Parcel, LIS is a framework that integrates order receipt, delivery management, route scheduling, and delivery status monitoring. LIS not only provides real-time operational information, but can also provide strategic insights that support decision making in logistics aspects.

Waiting Line Method

Queuing theory is a theory that concerns the mathematical study of queues or waiting lines. The formation of waiting lines is of course a service that exceeds the available capacity if the need for a service exceeds the available capacity to provide that service. Firmansyah & Hafidudin (2019).

The waiting line method is one of the methods used to solve problems in decision making such as employee selection, queuing for programs from computer systems, making employee schedules, and so on. The waiting line method is very useful for analyzing queue length, average service time, average waiting time (Muchlis & Ma'ruf, 2021).

The Waiting Line method has the aim of increasing the effectiveness of service in delivery services to customers so that it is hoped that it will increase its attractiveness to future customers carry out transaction processes for delivery of goods.(Wibowo & Suseno, 2022)

In a logistics context, the concept of a waiting line refers to a situation where products or orders must queue to receive service or be processed. Queuing theory is a mathematical analysis tool used to understand and optimize queuing situations. At the Lion Parcel Company, the waiting line method is used to manage the flow of receiving and processing customer orders.

Implementing the waiting line method at PT Lion Parcel involves steps such as determining the number of cashiers or order reception staff, estimating service time, and identifying bottleneck points that can slow down the process. A deep understanding of waiting line methods allows companies to allocate resources efficiently and reduce customer waiting time.

Customer Satisfaction

Customer satisfaction means a comparison between what consumers expect and what consumers feel when using the product. If consumers feel the product's performance is the same as or exceeds their expectations, it means they are satisfied. On the other hand, if the product performance is less than their expectations, it means they are not satisfied. Satisfaction is the level of a person's feelings after comparing the performance or results they feel with their expectations Gultom et al (2020).

In the logistics industry, customer satisfaction has become more important during the Covid-19 pandemic. Uncertainty and changes in shipping policies as well as potential delays can affect customer perceptions of logistics services. Therefore, it is important to understand how Logistics Information Systems and Waiting Line methods can influence customer satisfaction in unique contexts

Indicators for measuring customer satisfaction, according to Indrasari & Press (2019):

1. Conformity to expectations, namely satisfaction is not measured directly but concluded based on the conformity or discrepancy between expectations customers with actual company performance.
2. Interest in returning to visit, namely customer satisfaction measured by ask whether the customer wants to buy or reuse the service company.

Hypothesis

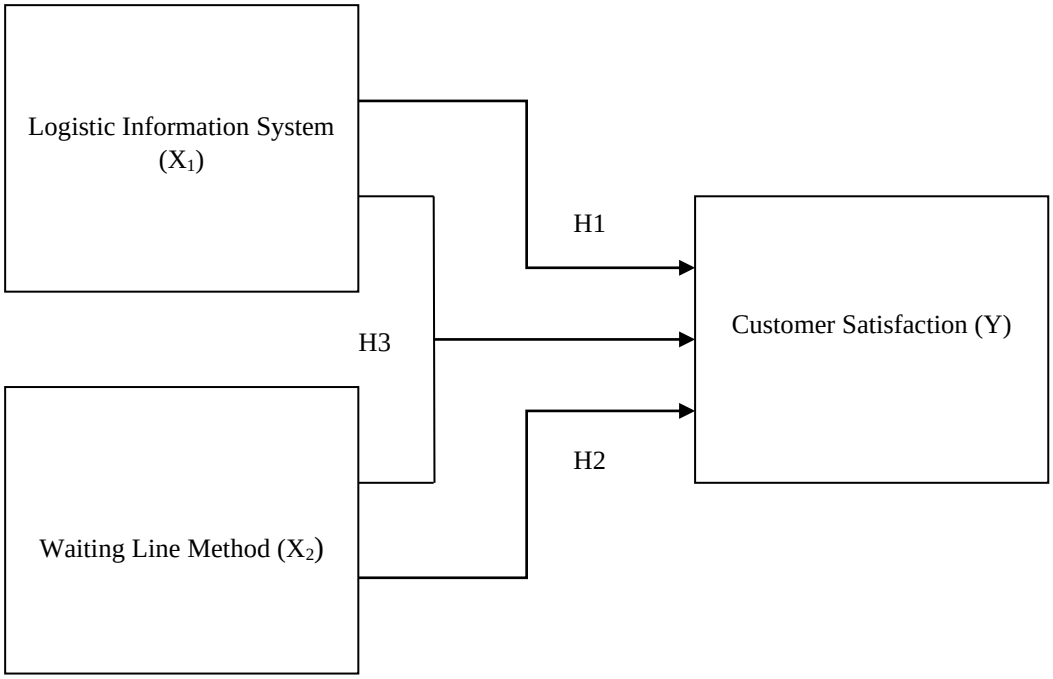


Figure 1. Framework

Starting from the rationale and thinking framework described, the hypotheses put forward by this researcher are:
H1: It is suspected that the Logistics Information System has an influence on customer satisfaction during the Covid-19 pandemic at Lion Parcel.
H2: It is suspected that the Waiting Line Method has an influence on customer satisfaction during the Covid-19 pandemic at Lion Parcel.
H3: It is suspected that the Logistics Information System and Waiting Line Method have an influence on customer satisfaction during the Covid-19 pandemic at Lion Parcel.

METHOD

The type of survey used was a quantitative survey. The tool used in managing results for all respondents is Smart PLS version 4, which is used to explain the analysis of the logistics information system and the waiting line method on customer satisfaction at Lion Parcel. This research includes survey research, where data collection is carried out using a questionnaire.

The population in this research is all users of the Lion Parcel expedition service who used its services during the Covid-19 pandemic, namely in July 2021. The sampling technique used in this study was a saturation sampling. According to Sugiyono (2019), saturated sampling is a sampling technique when all members of the population are used as samples. The condition of the respondents who were sampled were customers who had used the Lion Parcel expedition service. The number of samples taken was 100 respondents. The sample size was taken using the Hair formula. According , Hair et al. (2013) The Hair formula is used because the population size is not yet known with certainty. that the minimum sample size is 5-10 observations for each parameter being estimated. In this research, the sample size was 100 respondents from Lion Parcel consumers. So, with a total of 20 indicators multiplied by 5. So, through calculations based on this formula, the number of samples from this research is 100 respondents from Lion Parcel consumers.

RESULTS AND DISCUSSION

The objective of this data study is to asses the effects of Logistics information systems (X_1), Waiting Line Method (X_2), and Customer Satisfaction (Y) of Lion Parcel. Of the 100 overall respondents, there is a percentage of sex of 54.1% of men and 45.9% of females; age percentages of 0% of < 18 years old, 25.7% of 18–25 years old, 39.2% of 26–35 years old, 32.4% of 36–50 years old, and 2.7% >50 years old; job percentages amount to 20% of students, 46% of private employees, 11% of entrepreneurs, 3% of civil servants and 20% of others. The data analysis results will be used to prove hypotheses one through the construct validity test stage which consists of convergent validity, which pays attention to the loading factor value, AVE value and discriminant validity as indicated by the cross loading value.

Table 1. Characteristics of Respondents

		Frequency	%
Gender	Male	54	54.1
	Woman	46	45.9
Total		100	100
Age (years)	< 18 years old	-	0.0
	18 – 25 years old	26	25.7
	26 – 35 years old	40	39.2
	36 – 50 years old	32	32.4
	> 50 years old	2	2.7
Total		100	100
Job	Students	20	20
	Private Employees	46	46
	Entrepreneurs	11	11
	Civil servants	3	3
	Others	20	20
Total		100	100

Source: Data Result, 2023

Validity Test

Table 2. Result of the Data Processing Validity Test *(Outer Louding)*

Variable	Indicators	Outer Loading
Logistics information systems (X_1)	SIL1	**0.802**
	SIL2	**0.834**
	SIL3	**0.757**
	SIL4	**0.826**
	SIL5	**0.828**
	SIL6	**0.832**
	SIL7	**0.863**
	SIL8	**0.894**
	SIL9	**0.848**
Waiting Line Method (X_2)	WL1	**0.812**
	WL2	**0.811**
	WL3	**0.765**
	WL4	**0.830**
	WL5	**0.769**
	WL6	**0.864**
	WL7	**0.798**
Customer Satisfaction (Y)	KP1	**0.908**
	KP2	**0.917**
	KP3	**0.914**
	KP4	**0.904**

Source: Data Result, 2023

Based on the data in table 2, it is known that many of the research variable indicators have an outer loading value of >0.70. The data above shows that there are no variable indicators whose outer loading value is below 0.5, so that all indicators are declared suitable or valid for research use and can be used for further analysis. This states that it has a high level of validity, so it meets convergent validity. Thus, this model meets the criteria for good convergent validity. All indicators for the logistics information system variables, waiting line methods and customer satisfaction already have factor loading values above 0.70. Thus, the indicators forming the construct of the logistics information system, waiting line method and customer satisfaction are categorized as valid.

Tabel 3. Result of the *Average Variance Extracted* (AVE)

Variabel	*Average Variance Extracted* (AVE)
Logistics Information Systems (X_1)	0.693
Waiting Line Method (X_2)	0.625
Customer Satisfaction (Y)	0.829

Source: Data Result, 2023

Based on the AVE table and image, it can be seen that the AVE value for the Logistics Information System variable is >0.5 or 0.693, for the Waiting Line Method variable >0.5 or 0.625, and for the Customer Satisfaction variable >0.5 or 0.829. This shows that each variable has good discriminant validity.

Table 4. Discriminant Validity Results (Cross Loading)

	X1	X2	Y
KP1	0.753	0.713	0.908
KP2	0.748	0.710	0.917
KP3	0.755	0.701	0.914
KP4	0.778	0.724	0.904
SIL1	0.802	0.700	0.755
SIL2	0.834	0.696	0.645
SIL3	0.757	0.615	0.615
SIL4	0.826	0.671	0.685
SIL5	0.828	0.669	0.638
SIL6	0.832	0.774	0.678
SIL7	0.863	0.752	0.764
SIL8	0.894	0.784	0.733
SIL9	0.848	0.766	0.701
WL1	0.720	0.812	0.591
WL2	0.722	0.811	0.694
WL3	0.551	0.765	0.456
WL4	0.763	0.830	0.724
WL5	0.614	0.769	0.535
WL6	0.834	0.864	0.731
WL7	0.590	0.798	0.607

Source: Data processed by SmartPLS version 4.0, 2023

Based on Table 4, the cross loading values for the logistics information system quality variable with seven measurement indicators are SIL1 = 0.802, SIL2 = 0.834, SIL3 = 0.757, SIL4 = 0.826, SIL5 = 0.828, SIL6 = 0.832, SIL7 = 0.863, SIL8 = 0.894, SIL9 = 0.848. The variable values for the Waiting Line Method with seven measurement indicators are WL1 = 0.812, WL2 = 0.811, WL3 = 0.765, WL4 = 0.830, WL5 = 0.769, WL6 = 0.864, WL7 = 0.798. The value of the Customer Satisfaction variable with four measurement indicators is KP1 = 0.908, KP2 = 0.917, KP3 = 0.914, KP4 = 0.904. All indicators for the Logistics Information System, Waiting Line Method and Customer Satisfaction variables already have cross loading values above 0.70. This means that each latent variable already has good discriminant validity, meaning that the latent variable has a measuring instrument that is

highly correlated with other constructs or that discriminant validity at the indicator level is met.

Table 5. The result of Analysis Cronbach's Alpha

Variable	Cronbach's Alpha
Logistics Information Systems (X_1)	0.944
Waiting Line Method (X_2)	0.912
Customer Satisfaction (Y)	0.931

Source: Data Result, 2023

Based on the tables and graphs of the results from Cronbach's alpha, the Logistics Information System variable is >0.7, which is 0.944, the Waiting Line Method is >0.7, which is 0.912, and Customer Satisfaction >0.7, which is 0.931. Thus, these results can show that each research variable has met the Cronbach's Alpha value requirements, so it can be concluded that all variables have a high level of reliability.

Table 6. The result of analysis Composite Reliability

Variable	Composite Reliability
Logistics Information Systems (X_1)	0.946
Waiting Line Method (X_2)	0.921
Customer Satisfaction (Y)	0.931

Source: Data Result, 2023

The composite reliability value produced for each logistics information system variable, waiting line method and service quality is >0.7, where the composite reliability value of the Logistics Information System variable is 0.946, the Waiting Line Method is >0.7, which is 0.921, and Customer Satisfaction is >0.7, which is 0.931. Judging from the composite reliability value for each variable, the magnitude is >0.7, indicating that the three variables are reliable.

Tabel 7. The result of analysis R-*Square*

Variable	*R-Square*
Customer Satisfaction	0.711

Source: Data Result, 2023

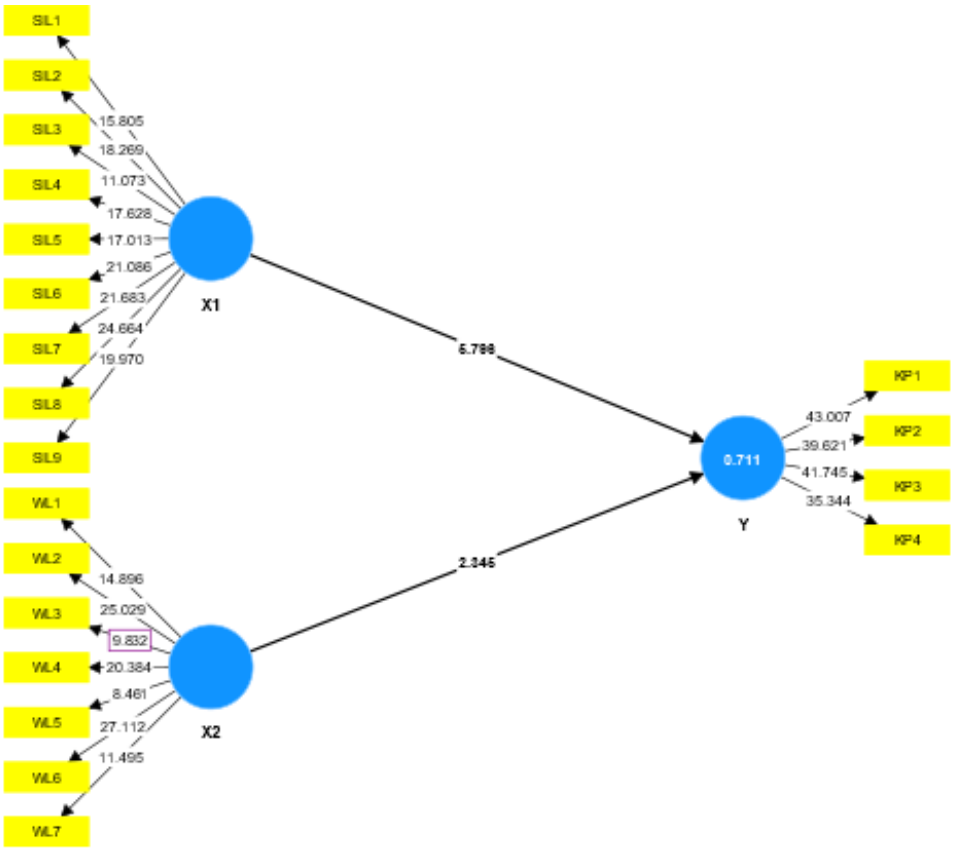
Based on the output of the analysis using the bootstrapping method, it can be seen that the R-Square value is 0.711, which can be explained that all exogenous latent constructs have an effect on Y of 0.711 or 71% in this study.

Tabel 8. Path Coefficients (Original Sample, T Statistics, P Values)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
X1 -> Y	0.617	0.615	0.107	5.796	0.000
X2 -> Y	0.251	0.250	0.107	2.345	0.019

Source: Data Result, 2023

The Result of Bootstrapping Variabel X_1, X_2 and Y



Source: Data Result, 2023

Based on these results, it can be concluded that the Logistics Information System has a significant positive effect on Customer Satisfaction as indicated by the original sample of 0.617. The significant value, namely 0.000, is smaller than the alpha level of 5%. This is indicated by the $t_{statistic}$ value of 5.796 which is greater than 1.96 (t_{table}). Then, the Waiting Line Method also has a positive and significant effect on customer satisfaction as shown by the original sample of 0.251. The significant value, namely 0.019, is smaller than the alpha level of 5%. This is indicated by the $t_{statistic}$ value of 2.345 which is greater than 1.96 (t_{table}).

Table 9. Effect of Independent Variable on Dependent Variable

	Value (y)	**$T_{statistics}$**	**T_{tabel}**	***Alpha***	**P_{Values}**	**Summary**
Logistics Information System	0.617	5.796	1.96	0.05	0.000	$t_{count} > t_{tabel}$ $P_{value} < alpha$
Customer Satisfaction						(H1 is accepted by H0 rejected)
Waiting Line Method	0.251	2.345	1.96	0.05	0.019	$t_{count} > t_{tabel}$ $P_{value} < alpha$
Customer Satisfaction						(H2 is accepted by H0 rejected)

Source: Data Result, 2023

Tabel 10. The Influence of Independent Variable Simultaneously on the Dependent Variable

	R *Square* (R2)	$T_{statistics}$	F_{tabel}	*Alpha*	Summary
Logistics Information System	0.711	119,320	3.12	0.05	$F_{count} > F_{tabel}$
Waiting Line Method					(H3 is accepted by H0 rejected
Customer Satisfaction					

Source: Data Result, 2023

1. Hypothesis 1: The Logistics Information System variable has (y) which is 0.617 with a $t_{statistic}$ value of 5.796 and a t_{table} value at alpha of 0.05, namely 1.96 and a p_{value} of 0.000 or less than 0.05. Through the results of the t-test between the Logistics Information System and Customer Satisfaction, this means that t_{count} (5.796) > t_{table} (1.96), then H1 is accepted and H0 is rejected.
2. Hypothesis 2: The Waiting Line Method variable has (y) which is 0.251 with $t_{statistic}$ value 2.345 and the t_{table} value at alpha 0.05 is 1.96 and the P_{value} is 0.019 or smaller than 0.05. Through the results of the t-test between the Waiting Line Method and Customer Satisfaction, this means that t_{count} (2.345) > t_{table} (1.96), then H2 is accepted and H0 is rejected.
3. Hypothesis 3: The R2 value for the customer satisfaction variable is 0.711 with F_{count} 119.320 and the F_{table} value at alpha 0.05, namely 1.96. This means that F_{count} (119,320) > F_{table} (3.12), then H3 is accepted and H0 is rejected. Thus it can be concluded that hypothesis 3 is proven, namely the Logistics Information System and the Waiting Line Method have a positive and significant influence of 71% on Customer Satisfaction. Meanwhile, 29% is influenced by other variables outside the research model.

Analysis of Logistics Information Systems (X_1) on Customer Satisfaction (Y)

After distributing questionnaires to PT Lion Parcel customers, the research results showed that there were 9 statement items in the Logistics Information System variable, so the results of the descriptive analysis showed that the Logistics Information System was seen from the total weighted average of 4.06.

In the 9 statements in the Logistics Information System variable, the average result of respondents' responses was the weight of the score with the highest value, namely the statement "Lion Parcel officers can explain informatively in explaining the lionparcel.com application to customers." with an average of 4.16, this shows that customers strongly agree that PT Lion Parcel employees provide good attention in handling customer needs so that customers feel satisfied. Meanwhile, for the average results of respondents' responses, the score with the lowest value is the statement "Lion Parcel rarely experiences delays in delivery. They tend to honor promised delivery schedules, which is a positive thing for customers." with an average of 3.95, this shows that PT Lion Parcel employees still lack commitment in estimating delivery times, thus causing customer dissatisfaction.

Analysis of Waiting Line Method (X_2) on Customer Satisfaction (Y)

After distributing questionnaires to PT Lion Parcel customers, the research results showed that there were 7 statement items in the Waiting Line Method variable, so the results of the descriptive analysis showed that the Waiting Line Method was seen from the total

weighted average of 3.91.

In the 7 statements in the Waiting Line Method variable, the average result of respondents' responses is the weight of the score with the highest value, namely the statement "Lion Parcel queues tend to be longer at certain times. Usually, these times occur during peak hours. Such as in the morning when many people send packages before work, and also towards the weekend when customers pick up or send items before the holidays." with an average of 4.21, this shows that PT Lion Parcel has met customer needs in accordance with customer expectations, in this case customers get modern technology services such as an online package drop system and providing detailed company information. Meanwhile, for the average results of respondents' responses, the score with the lowest value is the statement "Lion Parcel customers tend to refuse and do not want to join the queue if the customer feels the waiting time is too long to get service." with an average of 3.85, this shows that the company is still lacking in serving customer needs quickly, causing queues and long waiting times. This makes customers feel dissatisfied.

Analysis of Logistics Information System (X_1) and the Waiting Line Method (X_2) to customer satisfaction (Y)

After distributing questionnaires to PT Lion Parcel customers, the research results showed that there were 4 statement items in the Customer Satisfaction variable, so the results of the descriptive analysis showed that Customer Satisfaction from the total weight average was 4.07.

In the 4 statements in the Customer Satisfaction variable, the average result of respondents' responses is the weight of the score with the highest value, namely the statement "Customers are satisfied and use the Lion Parcel expedition service again." with an average of 4.16, this shows that customers strongly agree that PT Lion Parcel provides services that meet expectations and in accordance with the prices paid for expedition services by customers. Meanwhile, for the average results of respondents' responses, the weight of the score with the lowest value is the statement "Customers recommend Lion Parcel to other customers to use Lion Parcel services as the main choice in using expedition services." with an average of 3.96, this shows that customers feel that the service provided by PT Lion Parcel is less than optimal, with customer expectations causing customers to not be interested in recommending it to other customers.

CONCLUSION

Based on the results of research conducted by the author at PT Lion Parcel regarding Analysis of Logistics Information Systems and Waiting Line Methods on Customer Satisfaction During the Covid-19 Pandemic (Case Study of PT Lion Parcel for the 2020-2021 Period) the following conclusions can be drawn:

1. The Logistics Information System variable (X_1) has an influential relationship with Customer Satisfaction (Y), where the $t_{statistic}$ value is 5.796 and the t_{table} value at alpha 0.05 is 1.96 and the p_{value} is 0.00 or smaller than 0.05. Through the results of the t-test between the Logistics Information System and customer satisfaction, this means that t_{count} (5.796) > t_{table} (1.96), then H1 is accepted and H0 is rejected. The results of the analysis show that the Logistics Information System as the first variable is proven to have a significant effect on customer satisfaction, meaning that the hypothesis is accepted.
2. The Waiting Line Method variable (X_2) has a significant relationship with Customer Satisfaction (Y), where the $t_{statistic}$ value is 2.345 and the t_{table} value at alpha 0.05 is 1.96 and the pvalue is 0.019 or smaller than 0.05. Through the results of the t-test between the Waiting Line Method and customer satisfaction, this means that t_{count} (2.345) > t_{table}

(1.96), then H2 is accepted and H0 is rejected. The results of the analysis show that the Waiting Line Method as the second variable is proven to have a significant effect on customer satisfaction, meaning that the hypothesis is accepted.

3. In the Logistics Information System (X_1) and Waiting Line Method (X_2) variables on Customer Satisfaction (Y), where the R2 value for the customer satisfaction variable is 0.711 with F_{count} 119.320 and the F_{table} value at alpha 0.05, namely 1.96. This means that F_{count} (119,320) > F_{table} (3.12), then H3 is accepted and H0 is rejected. The results of the analysis show that the Logistics Information System and the Waiting Line Method as variables together are proven to have a significant effect on customer satisfaction, meaning that the hypothesis is accepted.

The quality of the Logistics Information System and the Waiting Line Method as variables together have been proven to have a positive and significant effect on customer satisfaction. These results are in line with research ((Sasmito Muslim, Wibowo, & Nofandi, 2021) that the Logistics Information System and Waiting Line Method on customer satisfaction has a significant influence from the quality of the Information and Logistics System service and the waiting line method on customer satisfaction.

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