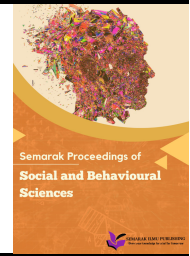




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Impact of Last-Mile Delivery Service Determinants on Online Repurchase Intention in E-Commerce

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ABSTRACT

Ensuring customer satisfaction significantly impacts the decision-making process for future product purchases. Customers with a positive online shopping experience are more likely to become loyal to a particular online retailer or brand, leading to repeat purchases. By drawing on Cognitive Appraisal Theory and Expectation Confirmation Theory, the study examines five dimensions of Last Mile Delivery (LMD) namely parcel racking, timely delivery, parcel condition, return logistics and deliveryman attitude, customer satisfaction, and repurchase intention. The study applied convenience sampling technique, and 203 responses were collected using online questionnaire, Google Form, which has been distributed via instant messaging and social media applications. SPSS was utilized to test the proposed hypotheses. The result shows that parcel tracking, timely delivery, and parcel condition are having positively significant relationship on repurchase intention. The study provides empirical and managerial contributions of parcel delivery service in e-commerce setting.

Keywords: Last Mile Delivery; last mile logistics; parcel delivery service; city logistics; online customer satisfaction; online repurchase intention

1. Introduction

In online shopping, there are many aspects that will motivate online customers to shop such as convenience use of website interface, smooth and safe payment transaction, price, and free shipping. One aspect that should not be forgotten is that the package must be delivered to the customer as soon as possible without any error or failure. With the increasing number of parcels to be delivered to the customers, this poses a real challenge to the online retailer logistics team. Because the parcel delivery service is the end tail of the supply chain and the only process that make human contact to the online shoppers, it is imperative for the online retailer through the “carrier” to meet customer’s expectations on the delivery of the parcels. The “carrier” is the logistics service provider which can be the inhouse delivery team of the online retailer or could be a third party appointed by the online retailer (outsourced courier company). Failure in the parcel delivery will have an impact to the customer satisfaction. With reference to L.D. Plessis [81], Suhaily and Soelasih [69], consumers who are satisfied with the performance of online shopping have a positive influence on their repurchase intentions.

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2. Literature Review

E-Commerce offers the advantages of being cheap due to its low operational cost compared to brick and mortar stores, 24 hours availability offers convenient to the customers and e-commerce has no geographical barriers where it can be performed between different continents in the world. According to Mordor Intelligence report, the Malaysian e-commerce market is estimated at USD 10.72 (RM 50.57) billion in 2024 and expected to reach USD 20.93 (RM 98.73) billion by 2029. Another report by digitalnewsasia.com on 30 November 2018, indicates that Poslaju has sorted and distributed 4.42 million parcels from e-commerce purchases during the biggest online “11.11 Mega Sale”. With the increasing number of parcels to be handled by the courier services, this poses real challenge to the service providers as they have to provide economic, efficient and error free deliveries to the e-Commerce customers.

During delivery, the carriers are facing several challenges where the parcels need to be delivered to many unique destinations instead of sending a large number of packages to a single destination. The delivery teams will have to make many stops along the complex routes. Heavy traffic and difficulty in finding parking space causing a lot of time wasted on the road. In a report by SOTI Inc., more than 61 % of logistics companies agree that parcel delivery service is the most inefficient process in the entire supply chain. At the same time, it represents the most time-consuming and expensive elements of the entire e-commerce supply chain.

A recent study by Osman *et al.*, [52] among Universiti Putra Malaysia (UPM) students, revealed that most surveyed respondents were “moderately” satisfied with their online buying experiences. This has given clear signal to the online retailers in Malaysia to make improvements and increase the online consumer satisfaction by focusing to improve their products and services in terms of quality of the products, on-time delivery services, and efficient online shopping systems. According to Malaysian Communications and Multimedia Commission (MCMC) e-Commerce Consumer Survey 2018, as many as 21.4% of online shoppers concern about delivery time. The survey also found that 85.3% of Malaysian online shoppers claimed that they received their purchased goods on time.

There are many issues in parcel delivery service that could give negative experience to the online shoppers, such as delivery status not updated for customer to track, delay in delivery, wrong delivery in terms of incorrect product and quantity and no communication between delivery person and the customer or the delivery person is not polite to the customer. Courier companies must cope with heightened expectations from consumers, who expect good parcel delivery service. Without a competent delivery service, consumer satisfaction with parcel delivery services may deteriorate as highlighted by Mock *et al.*, [45]. Bloomberg on 1 October 2020 reported that a study in the US found that 56 % of online shoppers will not buy again from the same seller if the customers are unhappy with the service.

When customers are satisfied with a product or service, they tend to exhibit loyalty, making repeated purchases and contributing to an increase in the business's revenue. Additionally, satisfied customers are likely to refer the product or service to others, resulting in more customers and a larger market share according to Rane *et al.*, [59]. Prior researches clearly indicate that positive experience of online shoppers may have high influence on the online repurchase intention.

According to Lim, Aw and Teoh [38], one of the biggest barriers for online shopping is that consumers undergo zero physical interaction throughout the transactions with reference to earlier study by Jiang *et al.*, [88] and Mukherjee and Nath [90]. Therefore, it is vital to understand customers' intention to repurchase online for the sustainability of online business.

This research aims to explore the importance of the last mile delivery service quality in e-commerce. This is the last process of online order fulfilment, a failure will affect reputation of the online retailer although the seller had initially fulfilled or satisfy the online shoppers with good website, easy order processing, good pricing, variety of products and secured payment system etc. Hence, it is important to understand how delivery service will impact the online customer satisfaction and decision to repurchase online. As such the research objectives will be:

- RO1: To examine the relationship between Parcel Tracking to online Repurchase Intention.
- RO2: To examine the relationship between Timely Delivery to online Repurchase Intention.
- RO3: To examine the relationship between Parcel Condition to online Repurchase Intention.
- RO4: To examine the relationship between Deliveryman Attitude to online Repurchase Intention.
- RO5: To examine the relationship between Return Logistics to online Repurchase Intention.

3. Theoretical Framework

Given the literature review, prior studies applied several theories to examine the factors that influence customers repurchase intentions. Commonly, the Expectation Confirmation Theory (ECT) and Social Cognitive Theory (SCT) have been widely used previously to evaluate customers online repurchase intention. The theory (ECT) explains how people's prior expectations influence their thoughts, feelings, and actions related to a product or service. In e-commerce context, prior to making online purchase, a person will have expectations about a product or services that he or she want to purchase. If the expectation is met positively by that person, he or she will be satisfied and when the product fails to meet consumers' expectations, this results in consumers' unfavourable attitudes (disconfirmation) and beliefs about the product Yang, Lu and Chau [95] as highlighted by Shukla *et al.*, [66]. A superior quality product will result in a higher customer satisfaction, compared to the inferior quality products. However, it is acceptable by consumers that for a disposable or one-time use product to be inferior in quality. Hence, the theory highlights how expectations prior to purchase and post-purchase experiences shape consumer satisfaction Oliver [92].

In Social Cognitive Theory, a person's decision will be influenced by outcome expectancies either positive or negative. Reciprocal Triadic Relationship (TRD) in Social Cognitive Theory proposes that human behaviour may be explained by continuous set of reciprocal interaction between the person past experiences (cognitive), behavioural intention (observing and making judgement) and the physical environment (situational factors). Each factor has reciprocal effects on each other through cognitive and behavioural process [94].

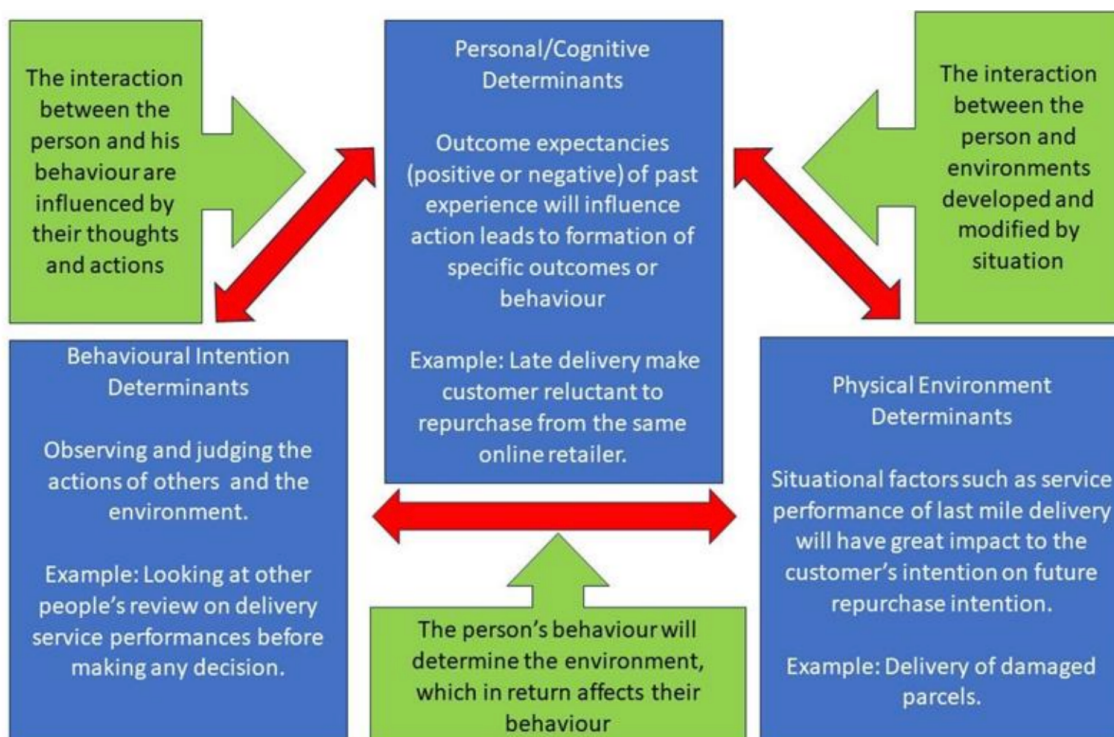


Fig. 1. Social Cognitive Theory. Source: adapted from Reciprocal Triadic Relationship in SCT Johnstone and Hooper [89]

4. Conceptual Framework

Five constructs have been identified, namely Parcel Tracking, Timely Delivery, Parcel Condition, Deliveryman Attitude and Returns will be measured to determine the strength of its relationship to the dependent variable (Online Repurchase Intention).

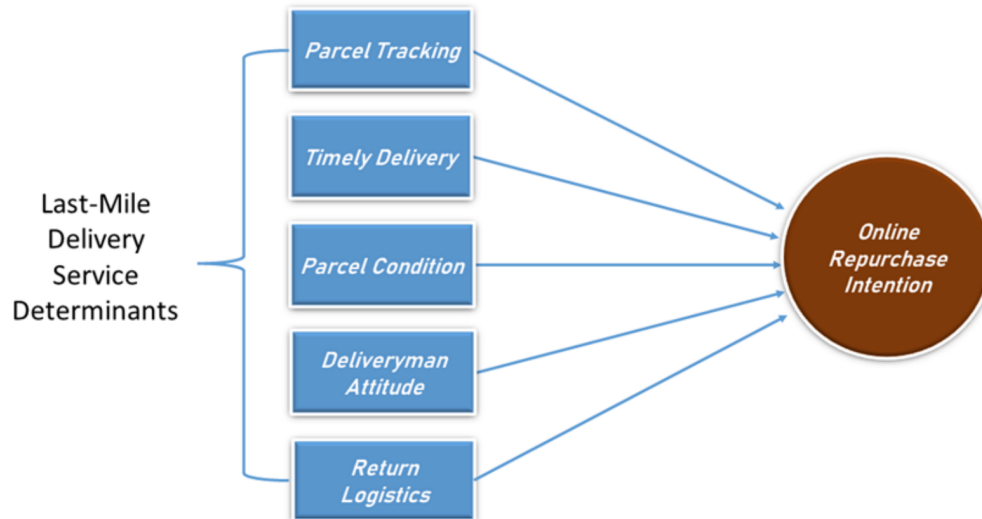


Fig. 2. The research framework

Timely Delivery – according to a GreyOrange Survey, 45% of consumers today expect 2-day shipping or less when they place an online order and 57% of customers won't return to the same online retailer after three late deliveries. Hoo Lien Yee and Dazmin Daud [81] on their research measuring customer satisfaction in parcel delivery service in Malaysia with SERVQUAL model reveals that customers are satisfied when parcel carriers are able to ship items within promised time. In a study conducted by Siali *et al.*, [67], in the context of parcel delivery service, "reliability" can be measured as the time taken to deliver a parcel and how many times the parcel reached the right place and final destination. Reliability positively affect customer satisfaction towards parcel delivery service of a courier company.

Parcel Tracking – online shoppers may track the whereabouts of their parcel after 24 hours just to ensure that the order have been placed and processed. Unable to track the parcel may make the buyer nervous due to uncertainty when the parcel will arrive. As such, easy tracking of shipment with apps or website is very important to meet customer's high expectation on real-time information and movement visibility of the parcels. According to Haron *et al.*, [87] online shoppers prefer courier service that offers cheap and timespecific delivery and clear shipment status via real-time electronic notification. The visibility of shipment is critical for customers. In 2018, research by dropoff.com found that 88% of customers consider real-time shipment tracking crucial for a positive customer experience (startups magazine.co.uk).

Parcel Condition – parcel condition is one of important aspect in parcel delivery service. Goods should be packed in a secure manner so that it can be protected from damage during the transportation and delivery. In research by Loo and Norhaidah [30], measuring customer satisfaction towards courier services in Johor, it was suggested that delivery men have to handle the parcels with extra care to make sure the parcels could be delivered as the original conditions in order to meet customer satisfaction. Ziaullah, Feng and Akhter [96] found that product quality and delivery services (i.e. product variety, quality, availability, reliable delivery, package safety and timely delivery) directly influence e-satisfaction and e-trust.

Deliveryman Attitude – the quality of delivery person also very important to portray the good image of the online retailer and the carrier. In an online shopping, this is the only person having contact with the online shopper, thus the contact or communication between them will be an experience which may influence the online shopper in their future purchasing decisions, depending on whether the experience is good or bad to the online shopper. Restuputri *et al.*, [93] indicates that major customers complain are about the inaccurate number of products packed, the delay and extension of delivery time, damages in packaging, and unfriendly couriers.

Return Logistics – return logistics is also referred to as Reverse Logistics. It is the flow of the goods in the opposite direction, from the market back to the production sites or in this research context, back to the etailer, the original point of sale. In e-commerce, returns occur when a customer is unhappy with a product and wants to return it or to report a failure [41]. A good return logistics process ensure that the goods returned safely and efficiently, and that customers are satisfied with the product and service they receive [44].

Online Repurchase Intention –Cuong [83] stated in order to maintain a good relationship with customers, it requires the online retailers to have action plans to satisfy the customers’ needs, which in return will develop trust and repurchase intention and minimize switching costs. Another study by Zhang and Nuangjamnong [97] highlighted that repurchase intention is a consumer behaviour that indicates a willingness to repurchase a certain goods or services and affects how much the buyer likes the product. Below hypotheses outline the expected relationships between the independent variables and the dependent variable as illustrated in the conceptual framework:

H1: Ease of Tracking has a positive significant influence on online Repurchase Intention. H2: Timely Delivery has a positive significant influence to online Repurchase Intention.

H3: Parcel Condition has positive significant influence on online Repurchase Intention.

H4: Deliveryman Attitude has positive significant influence to online Repurchase Intention

H5: Return Logistics has positive significant influence to online Repurchase Intention

5. Research Methods

In this study, deductive reasoning was used to determine how online repurchase intention be affected by the quality of the elements of last mile delivery (parcel delivery service). It relies on facts and rules where it begins from a theory, supports with observations, deriving and testing hypotheses, and confirm the theory. This study also employing the quantitative research methodology because by collecting accurate data, the results will be more reliable where the outcomes were based on numbers rather than subjective judgments. The analysis of numerical data is performed through statistical procedures, using SPSS software.

The researcher’s target population for this study was e-shoppers based in Selangor. Department of Statistics Malaysia (DOSM) conducted a nationwide survey in 2019 and reported that 2.22 million households in Selangor active in online shopping. Convenience sampling (non-probability sampling) method was used. Samples include the individuals most accessible to the researcher because there is no list of online shoppers in Selangor available. A survey was conducted to obtain the primary data from the samples. It consists of structured and closed-ended questions using Likert rating scale (strongly agree to strongly disagree). The questionnaires were also distributed to the participants via e-mails, social media and instant messaging applications. The Questionnaire was divided into 2 parts which are (1) Personal information, (2) Online shopping experience, (3) 27 questions with Likert scale.

6. Results

6.1 Demographic Analysis

The total usable responses were 203 out of 211 samples collected. Eight samples were rejected due to improper or missing answers. Males represent the highest gender participated in the survey with 112 or 55.2% and 91 or 44.8% are females. Most of the respondents aged 40 and above (43.8%) and those individuals with bachelor degree are the biggest group constituting 33% of the respondents with another 11.8% are holding postgraduate's qualifications. As many as 34.5% are working professionals and another 14.3% are self-employed. Only 25 students involved with the survey, representing 12.3% of the respondents.

6.2 Descriptive Analysis

Table 1

Descriptive analysis of respondents' demographics (N=203)

Variables	Category	Frequency	Percentage (%)
Gender	Male	112	55.2
	Female	91	44.8
Age	Less than 20	13	6.4
	21 to 30 years	45	22.2
	31 to 40 years	56	27.6
	40 and above	89	43.8
Educational Level	Secondary school	57	28.1
	Diploma	55	27.1
	Bachelor Degree	67	33.0
	Postgraduate	24	11.0
Employment Status	Student	25	12.3
	Professional	70	34.5
	Self Employed	29	14.3
	Others	79	38.9

All of the 203 respondents have online shopping experience, where 93 of them constituting 45.5% of the samples have conducted more than 10 times online purchases. As many as 99 or 48.8% have involved in online shopping for the period of 3 to 5 years. Shopee is the preferred online marketplace by 157 respondents (77.3%).

Table 2

Analysis of respondents' experience in online shopping (N=203)

Question	Answer	Frequency	Percent (%)
Online shopping experience	Yes	203	100.0
Which online marketplace do you use?	Shopee	157	77.3
	Lazada	24	11.8
	Taobao	3	1.5
	Others	19	9.4
Frequency of online purchasing	1-2 times	41	20.2
	3-5 times	43	21.2
	6-10 times	26	12.8
	More than 10 times	93	45.8

How long you have been shopping online?	Last 6 months	18	8.9
	6 months to 1 year	23	11.3
	1 to 3 years	63	31.0
	3 to 5 years	99	48.8

6.3 Reliability Analysis

The alpha coefficient for the 27 items is .945, suggesting that the items have relatively high internal consistency. Based on the decision-making rule, the Cronbach’s Alpha value should be more than 0.70 for the results to be “acceptable” or “sufficient” Nunally [91] and a composite reliability (CR) of 0.70 or greater is acceptable Fornell and Larcker [85] as cited by Md Fauzi Ahmad [43]. Meanwhile, if the value is more than 0.80 means it has “good” reliability while value more than 0.90 considered “excellent”. On the other hand, values less than 0.70 will require the data to be recollected.

Table 3
 Cronbach’s Alpha Reliability Test

Case Processing Summary			
		N	%
	Valid	203	100.0
	Excluded ^a	0	.0
	Total		
a. Listwise deletion based on all variables in the procedure.			
Reliability Statistics			
	Cronbach’s Alpha	N of items	
	0.945	27	

6.4 Validity Test

The test indicates how strong a single variable is correlated with other variables and each variable is predicted without error by the other variables. The KMO value can be between 0 and 1. When the value is closer to 1, it means that the factor analysis fits better. Furthermore, KMO value more than 0.5 are suitable for Principal Component Analysis as in this case, where the value is .925 which is more than 0.5 and closer to 1. With KMO value of .925 the sample size is excellent and adequate. In Bartlett's test when the significance value or p value is less than 0.05, it means that there is strong evidence of significant relationship among the variables in the dataset. On the other hand, if the significance value is greater than 0.05, it means that the variables are likely not related or there is not enough evidence to support a relationship. In this analysis, $p < 0.001$ which is less than 0.05 indicates that the variables in this analysis are significantly correlated with each other. Based on the data in this research, five significant variables have been identified because their eigenvalues are greater than 1, and the cumulative percentage is 70.294%. (Refer to the Principle Component Analysis table at next page). Therefore, it can be concluded that the first five factors are significant in explaining the majority of the variability in the dataset. These factors contribute substantially to the overall understanding of the observed variables, while the remaining factors contribute less to the overall variance.

Table 4
 KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.925
Bartlett's Test of Sphericity	Approx. Chi-Square	4333.867
	dF	351
	Sig.	<.001

Table 5
 Principle Component Analysis

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative	Total	Variance	% of Cumulative
1	12.409	45.959	45.959	12.409	45.959	45.959	7.059	26.143	26.143
2	2.590	9.594	55.554	2.590	9.594	55.554	4.821	17.855	43.998
3	1.476	5.466	61.020	1.476	5.466	61.020	4.263	15.788	59.786
4	1.317	4.876	65.896	1.317	4.876	65.896	1.431	5.301	65.087
5	1.187	4.398	70.294	1.187	4.398	70.294	1.406	5.207	70.294
6	.947	3.508	73.801						
7	.814	3.014	76.815						
8	.781	2.892	79.707						
9	.545	2.019	81.727						
10	.518	1.919	83.646						
11	.498	1.844	85.490						
12	.453	1.677	87.167						
13	.444	1.644	88.811						
14	.422	1.562	90.373						
15	.319	1.180	91.554						
16	.300	1.111	92.664						
17	.275	1.020	93.684						
18	.264	.978	94.662						
19	.242	.897	95.559						

Table 6
 Principle Component Analysis

	Rotated Component Matrix ^a				
	Component 1	Component 2	Component 3	Component 4	Component 5
Parcel Tracking		.741			
Parcel Tracking		.785			
Parcel Tracking		.769			
Parcel Tracking	.423	.548			
Parcel Tracking				-.661	
Timely Delivery	.449	.551			
Timely Delivery		.606			
Timely Delivery		.585			
Timely Delivery	.413			.510	
Timely Delivery	.463			.494	
Parcel Condition	.734				
Parcel Condition	.849				
Parcel Condition	.830				
Parcel Condition	.774				
Parcel Condition	.624		.403		
Deliveryman Attitude	.530				
Deliveryman Attitude	.461				-.588
Deliveryman Attitude					.846
Deliveryman Attitude	.738				
Returns			.865		
Returns			.864		
Returns			.840		
Returns			.893		
Online Repurchase Intention	.615	.402			
Online Repurchase Intention	.651	.537			
Online Repurchase Intention	.655	.455			
Online Repurchase Intention	.718	.449			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

The rotated component matrix is the key output of Principal Component Analysis used to interpret and simplify the strength of relationship between variables. The higher the value of the loading, the more factors contributes to the variable. Values greater than 0.4 are regarded as steady, according to Guadagnoli and Velicer [86] as cited by Qamar Islam [27] and values of 0.7 or higher are considered ideal. The findings are as follows:

1. There are moderate to strong correlations between variables Parcel Tracking, Timely Delivery, Parcel Condition, Deliveryman Attitude and Online Repurchase Intention to Component 1.
2. There are moderate to strong correlations between variables Parcel Tracking, Timely Delivery and Online Repurchase Intention to Component 2.
3. There are moderate to strong correlations between variables Parcel Conditions and Returns to Component 3.
4. There are moderate correlations between variable Timely Delivery to Component 4.
5. There is a strong correlation between variable Deliveryman Attitude to Component 5.

The findings suggest that each of the observed variables share common underlying dimensions as indicated by their high or moderate loadings on their respective components. Therefore, all 27 items are clearly explained in these five variables.

6.5 Correlation Analysis

The Pearson Correlation measures the strength and direction of the linear relationship between two variables. The further away the correlation coefficient is from zero, the stronger the relationship between the two variables. There are significant positive relations between Parcel Tracking and Online Repurchase Intention where the value of Pearson correlation is .684, followed by other variables respectively – Timely Delivery (.700), Parcel Condition (.627), Deliveryman Attitude (.648) and Returns (.486). Under the Test of Significance, the Sig. (2-tailed) the p-value is < 0.001 for all variables, indicate that there is evidence of a statistically significant bivariate association between the two continuous variables. If the p value > .05, there is evidence that there is not a statistically significant association between the two continuous variables. All other variables also indicate significant positive relations among each other with Pearson correlation values between .375 to .738 and the Sig. (2-tailed) p-value is < 0.001 for all variables, indicating a statistically significant bivariate association between the variables.

Table 7
 Correlation data analysis for multiple variables

		Online Repurchase Intention	Parcel Tracking	Timely Delivery	Parcel Condition (Visual Appeal)	Deliveryman Attitude	Returns
Online Repurchase Intention	Pearson Correlation	1	.684**	.722**	.788**	.661**	.375**
	Sig. (2-tailed)		<.001	<.001	<.001	<.001	<.001
	N	203	203	203	203	203	203
Parcel Tracking	Pearson Correlation	.684**	1	.700**	.627**	.648**	.486**
	Sig. (2-tailed)	<.001		<.001	<.001	<.001	<.001
	N	203	203	203	203	203	203
Timely Delivery	Pearson Correlation	.722**	.700**	1	.730**	.640**	.438**
	Sig. (2-tailed)	<.001	<.001		<.001	<.001	<.001
	N	203	203	203	203	203	203
Parcel Condition (Visual Appeal)	Pearson Correlation	.788**	.627**	.730**	1	.738**	.450**
	Sig. (2-tailed)	<.001	<.001	<.001		<.001	<.001
	N	203	203	203	203	203	203
Deliveryman Attitude	Pearson Correlation	.661**	.648**	.640**	.738**	1	.509**
	Sig. (2-tailed)	<.001	<.001	<.001	<.001		<.001
	N	203	203	203	203	203	203
Returns	Pearson Correlation	.375**	.486**	.438**	.450**	.509**	1
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	
	N	203	203	203	203	203	203

** . Correlation is significant at the 0.01 level (2-tailed).

6.6 Regression Analysis

From the result table above, the value of adjusted R-square is 69.1 %. The value of the adjusted r-squared may increase or decrease depending on the significance of the independent variable. The value is between 0 to 100% and the higher the better it is and a value greater than 50% is usually accepted. The Durbin-Watson statistic will value ranging between 0 and 4. Values below 2 means there is positive autocorrelation and values of 2.0 indicating zero autocorrelation while values above 2 to 4 means negative autocorrelation. In this test the Durbin-Watson statistics value is 2.137 indicating there is no autocorrelation detected in the data sample.

Table 8
 Result of adjusted R-square value for DV

Model Summary^b										
Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics			F	Sig.	Durbin-Watson	
				R Square	Change	Change				df1
1	.836 ^a	.699	.691	.48992	.699	91.556	5	197	<.001	2.137

a. Predictors: (Constant), Returns, Timely Delivery, Deliveryman, Parcel Tracking, Parcel Condition (Visual Appeal)
 b. Dependent Variable: Online Repurchase Intention

Table 9
 ANOVA: Result to define Sig. value for IV

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	109.875	5	21.975	91.556	<.001 ^b
	Residual	47.284	197	.240		
	Total	157.159	202			

a. Dependent Variable: Online Repurchase Intention
 b. Predictors: (Constant), Returns, Timely Delivery, Deliveryman, Parcel Tracking, Parcel Condition (Visual Appeal)

From the ANOVA table above, Significant value is 0.01, which is less than 0.05 means these variable data are modeling fit. Generally, the results are statistically significant if p-value is less than 0.05 meaning there are statistically significant differences among the groups. Hence, the null hypothesis that assumes no significant differences among the groups can be rejected. It can be concluded that there is a statistically significant difference between the means of the five groups in this analysis.

Table 10
 Result to define relationship between DV and IV

Coefficients ^a		Unstandardized		Standardized		95.0% Confidence Interval for B		Collinearity Statistics		
		B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.164	.208		.788	.432	-.246	.574		
	Parcel Tracking	.283	.070	.243	4.064	<.001	.146	.421	.427	2.343
	Timely Delivery	.214	.071	.194	3.011	.003	.074	.354	.368	2.714
	Parcel Condition (Visual Appeal)	.513	.071	.483	7.217	<.001	.373	.653	.341	2.929
	Deliveryman Attitude	.081	.083	.062	.981	.328	-.082	.245	.380	2.634
	Returns	-.067	.041	-.077	-1.634	.104	-.148	.014	.695	1.439

a. Dependent Variable: Online Repurchase Intention

Above table shows the strength of the relationships or the significance of the variables which impacts the dependent variable. The Sig. p-value should be below 0.05 in order for the null hypothesis to be rejected, means there is an impact. However, if Sig. p-value is > 0.05, then the null hypothesis is not rejected. The regression coefficient, measures the strength and direction of the relationship between a predictor variable (X) and the response variable (Y). In the presence of multicollinearity, the regression coefficients become unstable and difficult to interpret because the variance of the coefficients becomes large. A Variance Inflation Factor (VIF) less than 5 indicates a low correlation. A value between 5 and 10 indicates a moderate correlation, which is generally acceptable, while VIF values larger than 10 are a sign for high, not tolerable correlation of model predictors [98]. From the Coefficient table above, all independent values of VIF is less than 5, hence, there is no multicollinearity problem. It can be concluded that all the independent variables are not highly multicollinearity to each other. Key Findings The main objective of the research is to determine the relationship between dependent variable (online repurchase intention) and independent variables (parcel tracking, timely delivery, visual appeal, deliveryman attitude and return logistics). Data related to the variables were gathered through online survey by Google Form distributed via WhatsApp application and e-mails.

Descriptive analysis, reliability test, validity test, correlation analysis and regression analysis have been employed to determine the strength of the relationship between the dependent and independent variables and the results were shown in Chapter 4. In order to measure the significance of the independent variables to the dependent variable, five research questions have been established. Those are RO1 to RO5, as the following:

- RO1: To examine the relationship between Parcel Tracking to online Repurchase Intention.
- RO2: To examine the relationship between Timely Delivery to online Repurchase Intention.
- RO3: To examine the relationship between Parcel Condition to online Repurchase Intention.

RO4: To examine the relationship between Deliveryman Attitude to online Repurchase Intention.
 RO5: To examine the relationship between Return Logistics to online Repurchase Intention.

Five hypotheses have been tested to answer the research questions based on the research problem and objectives. The hypothesis test results were presented as follows:

Table 11
 Hypothesis test result summary

<i>Hypothesis</i>	<i>Coefficient's Sig.</i>	<i>Results</i>
<i>H1: Parcel Tracking had a positive significant influence on online Repurchase Intention.</i>	<.001	Supported
<i>H2: Timely Delivery has a positive significant influence to online Repurchase Intention.</i>	.003	Supported
<i>H3: Parcel Condition has positive significant influence on online Repurchase Intention.</i>	<.001	Supported
<i>H4: Deliveryman Attitude has positive significant influence to online Repurchase Intention.</i>	.328	Not supported
<i>H5: Return Logistics has positive significant influence to online Repurchase Intention.</i>	.104	Not supported

RO1: To examine the relationship between Parcel Tracking to online Repurchase Intention.

The result of Sig. p-value <.001 is below significance level of 0.05, revealing that Parcel Tracking has positive significant influence on Online Repurchase Intention, so that alternative hypothesis that Parcel Tracking has no positive influence on Online Repurchase Intention cannot be supported. The result from this study supported the H1 hypothesis which indicate that Parcel Tracking is an important factor in shipping services. The visibility of the parcel movement and its updates on delivery progress or shipment status toward the recipient can improve the parcel delivery service levels and increase the online shoppers' satisfaction.

RO2: To examine the relationship between Timely Delivery to online Repurchase Intention.

The hypothesis proposed a significant relationship between Timely Delivery of parcel and Online Repurchase Intention of the e-shopper. The result of Sig. p-value is 0.003 is smaller than alpha 0.05, indicating that Timely Delivery has a significant effect on the Online Repurchase Intention. Referring to the shown result, alternative hypothesis that Timely Delivery has no positive significant influence to the Online Repurchase Intention cannot be supported. Therefore, e-retailers must ensure that the shipping services being the last leg of the online shopping process need to be performed with minimal errors. Majority of online shoppers cannot tolerate delayed deliveries from the promised delivery dates.

RO3: To examine the relationship between Parcel Condition to online Repurchase Intention.

Based on the coefficient's Sig. p-value <0.001 it was clearly shown that the value is smaller than 0.05, where the hypothesis that Parcel Condition has positive significant influence to Online Repurchase Intention can be supported. Good appearance and intact parcels are important to online customer satisfaction and will significantly affect online Repurchase Intention as found in this study. Good packing method and use of proper materials will contribute to secure packing of parcels. This

will ensure that the goods are well protected and could avoid pilferage as well as damage during warehouse transit and transportation

RO4: To examine the relationship between Deliveryman Attitude to online Repurchase Intention.

The hypothesis that Deliveryman Attitude has positive significant influence to Online Repurchase Intention cannot be supported as the coefficient's Sig. p-value is 0.328 which is greater than significance level of 0.05 means that deviation from the null hypothesis is not statistically significant and the null hypothesis cannot be rejected. A p-value greater than 0.05 also indicate that no effect was observed. Apparently, Deliveryman Attitude is not significantly having influence over online Repurchase Intention as some online shoppers were reluctant to meet the deliveryman or as long the parcel arrived in a safe and secure manner, there is no necessity to have contact with the deliveryman. Some premises have parcel lockers (dedicated delivery box) for the recipients to collect the delivered parcels, hence there is no contact between the recipient and the deliveryman is needed.

RO5: To examine the relationship between Return Logistics to online Repurchase Intention.

Because of the coefficient's Sig. p-value is 0.104 which is greater than 0.05, this hypothesis that Return Logistics has positive significant influence to Online Repurchase Intention also could not be supported, thus, the null hypothesis cannot be rejected. Return Logistics is not a significant determinant of last mile delivery that have influence to the Online Repurchase Intention compared to other determinants such as Parcel Tracking, Timely Delivery and Parcel Condition.

7. Discussion

The aim of this study was to examine the influence of last mile delivery elements on online repurchase intention. A satisfied customer tends to purchase more from the same e-retailer as such numerous research were done to measure the online shopper e-satisfaction. E-satisfaction is a measurement of consumer satisfaction on using e-commerce application [53]. According to the authors, online shoppers who satisfied with the e-commerce applications may make large purchases and it will generate interest to repurchase in the future. With reference to Kotler and Keller (2009), the same authors mentioned 17 that consumers can be satisfied or dissatisfied after making purchases. The experience will influence the postpurchase behaviour where the satisfied customers will return to buy the same product or other product from the same retailer.

Last mile delivery or parcel shipping services also plays important role to meet online customer satisfaction similar to the use of e-commerce application as revealed by above mentioned research. Escudero-Santana *et al.*, [3] that the latter has analysed each stage of the online customer experience (pre-purchase, purchase and post-purchase), and found that the delivery order fulfilment (last mile delivery) has a higher impact on customer satisfaction than the pre-purchase stage. This study however not to examine the overall performance of last mile delivery, but to identify which elements of last mile delivery has significant influence to the online repurchase intention. Five elements have been selected, namely; Timely Delivery, Parcel Tracking, Parcel Condition, Deliveryman Attitude and Return Logistics.

Based on the findings of this study, Timely Delivery has significant impact to the online repurchase intention which is consistent with Escudero-Santana *et al.*, [3] in their work highlighting punctuality in deliveries is one of the main aspects of logistical performance that influencing e-commerce

customer satisfaction. In earlier research, Suhaily and Soelasih [69] found that e-service quality has a positive influence to customer satisfaction and repurchase intention. E-service quality referring to e-retailer website that facilitates efficient and effective shopping, purchasing and delivery.

In order for an e-retailer to gain trust from e-shoppers, product should arrive promptly within the promised time frame. Unpredictable delivery time may lead to customer dissatisfaction, while timely delivery enhances the overall e-shoppers experience. With many e-commerce giants offering next day or same day delivery options, customers' expectations for delivery times has increasingly high. As such it is imperative for e-retailers to meet the promised delivery window.

Shipment tracking plays an important role in last mile delivery by providing vital information relating to the merchandise ordered by e-shoppers while it is in transport. It offers visibility to the e-shoppers to accurately monitor the progress and the location of their parcels in real-time. Transparency not only elevates the e-shopper experience, but to build trust and reduce stress resulting from not knowing the progress of the deliveries. Earlier research findings [77] mentioned that delivery tracking helps e-shopper to organise time to receive the parcels and it can be an interesting and exciting experience if the merchandise is something important that the e-shopper wanted for a long time. Kelly and Norhaidah [30] also highlighted that advance updates and easy of tracking the shipment has achieved customer expectation when using courier services in Johor, Malaysia.

The use of parcel tracking applications or web tracking will eliminate the needs of the e-shoppers to call the Customer Service to check on the status of the delivery. As such it is a win-win situation for the e-retailers and the e-shoppers as lots of time can be saved by both parties in relation to reduced inbound and outbound calls between the e-shoppers and the Customer Service. Parcel tracking is one of the courier service dimensions of service quality, in this study, parcel tracking found to have significant influence on online 18 repurchase intention. The result is in line with Kusumawardani and Hastayanti [33] which the authors confirms the relation of service quality-repurchase intention in courier service. It is also consistent with the findings of Ain and Siddiqui [2] that shipping and tracking have significant effect on customer satisfaction and future purchase intention.

Selecting parcel condition as one of the independent variables is to address the issues of parcel safety and security where the parcel should be in good shape and intact during hand over from the deliveryman and recipients (e-shoppers). The challenges that faced by the carrier is that the parcel might be damaged during transportation, or item missing due to theft. Hence it is imperative that the parcel must use suitable materials and tamper-evident packaging and seals to ensure its safety and security. The importance of parcel condition was demonstrated in Ilya Yanorizar *et al.*, [25] where the result of the analysis on e-shoppers receiving their parcels in good shape indicate high score of (3.26 mean), a satisfaction level higher than receiving parcels in reasonable time (3.04 mean).

Both deliveryman attitude and return logistics have no significant effect to online repurchase intention in this study. A previous study by Kelly and Norhaidah [30] on customer satisfaction towards courier services in Johor however found that the staff dress code and attitude of personnel did not met customer expectation and have impact on customer satisfaction, which is contradicting to the findings of this study. In another previous study, according to Boysen, Fedtke and Schwerdfeger [8] some deliverers have the habit (or policy) to simply leave parcels in front of the door, even if customers are not at home. Such practice might be the answer as to why in this study respondents did not seriously want to have contact with the deliveryman. The use of parcel locker as in European countries may also limits the contact between deliveryman and the recipients. In addition, the current practice in Malaysia, the deliveryman will text the recipients via WhatsApp or call when he

leaves the parcel in front of the door or at dedicated parcel drop points thus eliminating the need of face to face handover.

Return logistics also has no significant effect to online repurchase intention, as such the hypothesis cannot be supported. However, this is not in line with Ain and Siddiqui [2] where the authors posited that return service is more essential for customers in Karachi, Pakistan. With the overwhelming success of e-commerce, increased return rates can be anticipated by the e-retailers and e-shoppers at the same time e-shoppers are expecting a seamless return process. There are several reasons for the e-shoppers to return the product, mainly because – defects, damage, wrong item, warranty claims, product recalls or simply changes of preferences. According to Statista (2023) Switzerland has the highest return rate per e-shoppers in Europe at 62%, followed by Germany (55%) and United Kingdom (54%). An earlier survey in 2013 reveals that the high return rate in Germany is favoured by the fact that most returns are free of charge, especially in the fashion segment and many consumers frequently order more products than needed [48]. As such the high return rate could probably been stimulated by the e-retailers' return policy allowing the customers to return the goods without any reason and as a consequence, it has developed habit for eshoppers ordering a wide range of fashion items then returning most of them.

Shopify.Com reported that in 2023 total returned products worth 14.5% of total retail sales in the US whereas during the same period, total return rate in Malaysia is standing at 7.9% as reported by ecommercedb.com. 19 The finding of this study is consistent with low return rate by e-shoppers in Malaysia where return logistics did not significantly affect the online repurchase intention. However, the result is also not in line with earlier study by Martinez-Lopez *et al.*, [42] where the authors highlighted that integrated return shipping (use of appointed carrier by the e-retailer instead of third party carrier) and consumer-friendly return shipping policy can strengthen consumer repurchase intentions.

8. Limitation and Recommendation

Because the samples only restricted to local respondents reachable by social media like Facebook and instant messaging applications like WhatsApp, it might not be sufficient to infer generalisations based on the findings. It will be great if the samples can be reach via consumer organisations, student bodies or other groups with larger population which may produce better results.

The current study only employed five determinants of last mile delivery as independent variables and its impact to the online repurchase intention. Most previous research focused on accurate and timely delivery, delivery cost and routing, the adaptation of technology in parcel tracking, customer service, efficiency of return management as well as measuring consumer experience and satisfaction. The parcel condition in terms of damage and proper packing method for example, yet to be studied vigorously compared to delivery efficiency. It is suggested that future research should emphasise to measuring more indicators of last mile delivery that may affect the decision making or repurchase behaviour of the consumers which is not included in this study. More study is also needed to validate the dimensions named in this study.

9. Conclusion

This research confirms and extends previous efforts to uncover the role played by last mile delivery in the etail context. However, numerous previous research only examining shipping services or last mile delivery as a single factor in measuring the quality of end tail logistics of the e-commerce, whereas this study focusing on several dimensions or elements of the last mile delivery.

Based on the result of this study, three out of five independent variables have significant impact to the online repurchase intention of the e-shoppers. Those independent variables are; timely delivery, parcel tracking and parcel condition. Identifying the factors that affect customer experience in last mile delivery allows service providers to focus on the key areas that been used as independent variables in this paper. Therefore, e-retailers or the carrier (logistics provider) based on the finding of this study, might be able to improve the service quality in order to create loyal customers as loyal customers often purchase more from the same brand or e-retailers. Additionally, these results also may suggest to all the logistics service providers to pay attention on their employees training and use of technology to ensure that products are delivered secured, safely and timely.

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