

Context-Contingent Service Quality Formation in Emerging E-commerce Environments: Reassessing SERVQUAL in Malaysia's CEP Industry

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Abstract

The expansion of e-commerce has transformed evaluation criteria within Malaysia's courier, express, and parcel (CEP) industry, raising questions about the contextual applicability of traditional service quality models. This study re-examines the SERVQUAL framework in a digitally mediated, high-frequency service environment by integrating additional value-oriented attributes. Using survey data from 482 CEP users and partial least squares structural equation modelling (PLS-SEM), the findings demonstrate a differentiated configuration of service quality effects. Reliability, assurance, convenience, and price exhibit significant positive associations with customer satisfaction, whereas responsiveness, empathy, and tangibility do not emerge as statistically significant predictors in the present context. Customer satisfaction subsequently exerts a substantial positive influence on re-use intention. The results suggest a structural recalibration of service quality formation in platform-based logistics systems, in which certain classical dimensions serve as baseline expectations rather than differentiating predictors. By demonstrating the context-contingent configuration of service quality effects, this study advances a more situational understanding of service evaluation in emerging digital economies.

Keywords: SERVQUAL, Service Quality, Customer Satisfaction, Courier, Express and Parcel (CEP), Re-use Intention

Introduction

The rapid expansion of e-commerce has fundamentally transformed the logistics landscape worldwide, positioning courier, express, and parcel (CEP) services as a critical infrastructure supporting digital economies. In Malaysia, national digital transformation initiatives such as MyDIGITAL, the Twelfth Malaysia Plan (RMK-12), and JENDELA have accelerated the development of digital commerce ecosystems and strengthened logistics networks that facilitate online transactions. As a result, CEP services have become an indispensable component of everyday economic activity, connecting digital marketplaces with consumers

and enabling the efficient circulation of goods within the digital economy (Muhthar et al., 2022; Mordor-Intelligence, 2026).

The significance of CEP services has become even more evident in the post-pandemic period. The rapid growth of business-to-consumer (B2C) e-commerce has shifted parcel delivery toward high-frequency, small-volume, and time-sensitive transactions. Under these conditions, the performance of CEP systems increasingly shapes customer experience, trust in online platforms, and the overall efficiency of digital commerce markets. Previous studies have identified e-commerce expansion as a major catalyst for CEP market growth and service innovation (Gulc, 2021; Ponnusamy & Ramasamy, 2024). Consequently, understanding how users evaluate courier service quality has become an increasingly important issue for both academic research and logistics management practice.

Beyond market expansion, CEP services also play a broader role within national development strategies. In Malaysia, the government has introduced policy initiatives aimed at strengthening the efficiency, inclusiveness, and sustainability of the courier industry. The PAKEJ initiative launched in 2021, and its subsequent upgrade to PAKEJ+ in 2024 under the supervision of the Malaysian Communications and Multimedia Commission (MCMC), form part of a five-year roadmap intended to improve logistics service quality and promote sustainable industry development (BERNAMA, 2021). These initiatives reflect the increasing recognition that CEP services function not only as a commercial service sector but also as a key infrastructural component supporting digital economic transformation and societal connectivity. However, despite the implementation of these policy measures, systematic empirical evidence assessing how improvements in courier service quality influence customer perceptions and behavioural responses remains limited.

Existing research on CEP services has largely concentrated on industry-level performance indicators, operational efficiency, and logistics sustainability practices (Otsetova & Dudin, 2018; Lei et al., 2022). While these studies provide valuable insights into the structural dynamics of the logistics sector, relatively little empirical research examines service quality from the perspective of end users who interact directly with courier services in their everyday e-commerce activities. This limitation is particularly important in B2C-dominated logistics systems, where customer satisfaction and continued service usage represent crucial indicators of service performance and long-term market competitiveness. Without a user-centred perspective, it remains difficult to fully understand how service quality attributes influence behavioural outcomes in rapidly evolving digital commerce environments.

The SERVQUAL framework proposed by Parasuraman et al. (1988) remains one of the most widely applied models for evaluating service quality across a range of industries. However, the contemporary CEP environment is increasingly shaped by digital platforms, automated logistics processes, and growing sustainability concerns. Under such conditions, additional service attributes such as convenience, price perception, and environmentally responsible logistics practices have become increasingly salient in shaping customer evaluations of service performance (Kawa & Pierański, 2021; Fan et al., 2025). Despite their growing importance, these extended service attributes are rarely integrated into a comprehensive empirical framework alongside traditional SERVQUAL dimensions.

Moreover, the relevance and explanatory power of classical service quality dimensions may vary across different institutional and technological contexts. In highly standardised logistics environments characterised by digital platforms and automated delivery systems, certain traditional service attributes may function as baseline expectations rather than differentiating predictors of customer satisfaction. This suggests the need to reassess the contextual applicability of SERVQUAL within emerging digital logistics systems and to examine how different service attributes jointly influence user evaluations and behavioural intentions.

Against this backdrop, the present study re-examines the determinants of customer satisfaction and re-use intention in Malaysia's CEP industry by extending the SERVQUAL framework to include additional value-oriented service attributes, namely convenience, price, and green logistics practices. Using survey data from Malaysian CEP users and applying partial least squares structural equation modelling (PLS-SEM), this study investigates how multidimensional service attributes shape customer satisfaction and how satisfaction subsequently influences re-use intention. By developing and empirically testing an integrated service evaluation framework tailored to Malaysia's digital commerce environment, this research contributes to a more context-sensitive understanding of service quality formation in platform-mediated logistics systems.

Beyond its theoretical implications, the study also provides practical value for industry practitioners and policymakers. For regulators, the findings offer empirical insights that may assist in evaluating the effectiveness of initiatives such as PAKEJ+ in enhancing service quality and promoting sustainable logistics practices. For CEP firms operating in increasingly competitive digital markets, the results identify key service attributes that most strongly influence customer satisfaction and continued service usage. These insights may support strategic decision-making aimed at improving service performance, strengthening customer relationships, and enhancing long-term competitiveness within the evolving digital logistics ecosystem.

Literature Review

Amid rapid e-commerce expansion, courier services have become a core component of digital infrastructure, and the relationship between service quality and customer satisfaction has attracted sustained attention in operations management, marketing, and logistics research. During the COVID-19 pandemic, the surge in delivery demand further intensified scholarly interest in service performance and customer experience (Tang et al., 2022). Drawing on recent empirical studies, this section reviews key dimensions of courier service quality, the mediating mechanisms underlying customer satisfaction, and the growing integration of green and digital attributes. The aim is to synthesise theoretical developments and identify unresolved research gaps.

Early research predominantly adopts the SERVQUAL model, which conceptualises service quality across five dimensions: tangibility, reliability, responsiveness, assurance, and empathy. Empirical evidence consistently identifies reliability, responsiveness, and empathy as significant predictors of customer satisfaction (Jamal et al., 2018; Yaacob & Yaacob, 2022). Nevertheless, the relative importance of these dimensions varies across national and cultural contexts. In Malaysia, empathy has been found to exert the strongest influence on customer satisfaction (Tang et al., 2022). In Poland, ease of technology use and trust are proposed as

additional quality dimensions beyond traditional SERVQUAL constructs (Ejdys & Gulc, 2020). Furthermore, logistics service quality frameworks extend the analysis to structural components such as operational quality, information quality, and personnel contact quality (Lin et al., 2023), reflecting increasing complexity in courier service evaluation.

Customer satisfaction is widely conceptualised as a central explanatory construct linking service quality to behavioural outcomes. Evidence from Bulgaria indicates that customer satisfaction fully mediates the relationship between courier service quality and customer loyalty (Sivadas & Baker-Prewitt, 2000). Similarly, research on instant courier services in Indonesia demonstrates that customer satisfaction and trust jointly mediate the relationship between perceived service quality and repurchase intention (Kusumawardani & Hastayanti, 2020). Regarding moderating variables, findings remain mixed. Valaei et al. (2016) report that ethnicity moderates overall service quality perceptions, whereas age and gender show no significant effects. In contrast, Walsh and Bartikowski (2013) find that the influence of corporate ability and social responsibility on customer satisfaction differs between Germany and the United States.

As sustainable development gains global prominence, research increasingly incorporates green logistics practices and environmental, social, and governance performance into service quality evaluation. Green delivery options, including parcel lockers and environmentally friendly packaging, have been shown to enhance customer satisfaction and repurchase intention (Kawa & Pierański, 2021). In the context of digital transformation, firms' ESG performance influences customer behaviour indirectly through brand trust and perceived value (Fan et al., 2025; Koh et al., 2022). Moreover, digital maturity and dynamic delivery capabilities are positively associated with service innovation performance and customer satisfaction (Sitorus et al., 2022).

The SERVQUAL model proposed by Parasuraman et al. (1988) remains one of the most influential frameworks for assessing service quality. It conceptualises service quality as the gap between customer expectations and perceived service performance. Given the service-intensive nature of logistics operations, SERVQUAL has been extensively applied in logistics research. The framework evaluates service performance through five dimensions: tangibility, reliability, responsiveness, assurance, and empathy, which are widely used to examine their relationship with customer satisfaction.

Reliability refers to the ability of service providers to deliver promised services accurately and consistently (Parasuraman et al., 1985; Parasuraman et al., 1991). It encompasses error-free operations, punctual delivery, accurate billing, and safe and efficient service processes (El Saghier & Nathan, 2013; Jamal et al., 2018). In the courier and parcel industry, reliability is reflected in accurate delivery, effective problem resolution, pricing consistency, and operational stability. Empirical studies consistently identify reliability as a critical determinant of customer satisfaction (Jamal et al., 2018). Therefore:

H1: Reliability has a positive effect on customer satisfaction with courier services in Malaysia. Responsiveness denotes the willingness and ability of service providers to assist customers promptly and effectively (Parasuraman et al., 1985). It includes timeliness, flexibility in problem handling, and sensitivity to customer needs (El Saghier & Nathan, 2013). In time-

sensitive services such as courier operations, responsiveness strongly influences customer satisfaction (Al-Weshah et al., 2013; Gulc, 2021). Inefficiencies and delivery delays undermine perceived responsiveness, whereas competent personnel enhance satisfaction (Jamal et al., 2018). Accordingly:

H2: Responsiveness positively affects customer satisfaction with courier services in Malaysia. Empathy emphasises personalised care and individualised attention in service encounters (El Saghier & Nathan, 2013; Sureshchandar et al., 2002). It is manifested through flexible delivery arrangements, respectful communication, and attentiveness to customer-specific needs. Empirical evidence indicates that empathetic service behaviours enhance customer satisfaction and loyalty (Sureshchandar et al., 2002). Therefore:

H3: Empathy positively affects customer satisfaction with courier services in Malaysia. Tangibility captures the physical aspects of service provision, including facilities, equipment, staff appearance, and communication materials (El Saghier & Nathan, 2013). Although Parasuraman et al. (1994) suggest that tangibility may exert a weaker influence on satisfaction, subsequent studies report context-dependent findings (Chodzaza & Gombachika, 2013). In courier services, tangibility is reflected in modern equipment, professional appearance, outlet conditions, and digital interface design. Accordingly:

H4: Tangibility positively affects customer satisfaction with courier services in Malaysia. Assurance refers to employees' knowledge, courtesy, and professionalism that foster customer trust and confidence (Parasuraman et al., 1991). It reflects the ability to convey competence, safety, and reliability during service delivery (El Saghier & Nathan, 2013). Empirical research indicates that assurance is an important determinant of satisfaction and trust in service industries (Shahin & Chan, 2006). Therefore:

H5: Assurance has a positive effect on customer satisfaction with courier services in Malaysia. Convenience refers to the time and effort customers expend in accessing and using services (Chan et al., 2010). In courier contexts, it encompasses accessibility, ease of digital booking and tracking, and flexible delivery options (Park et al., 2009). Prior research consistently shows that reduced customer effort enhances satisfaction (Dabholkar & Bagozzi, 2002; Ranjbarian et al., 2012; Akbaba, 2006; Cho & Sung, 2007; Lai et al., 2007). Thus:

H6: Convenience positively affects customer satisfaction with courier services in Malaysia. The price reflects both the monetary cost and the perceived value (Kotler et al., 2015; Petrick, 2004). From a value perspective, satisfaction arises when perceived benefits exceed price-related sacrifices (Woodruff, 1997). Empirical studies across industries demonstrate that favourable price perceptions positively influence customer satisfaction (Ahmed et al., 2023; Almanwari et al., 2024; Elgarhy & Mohamed, 2023). Evidence in courier and e-commerce settings confirms that reasonable pricing enhances satisfaction and repurchase intention (Handoyo et al., 2025; Nugraha et al., 2023). Accordingly:

H7: Price has a positive effect on customer satisfaction with courier services in Malaysia. Green logistics refers to environmentally responsible logistics practices that aim to reduce environmental impact while maintaining efficiency (Rodrigue et al., 2017; Sbihi & Eglese, 2010). Practices include low-emission vehicles, route optimisation, and sustainable packaging

(Sureeyatanapas et al., 2018). Recent studies show that green logistics enhances perceived value and customer satisfaction (Elektra et al., 2024; Lee & Klassen, 2008). Therefore:
H8: Green logistics positively affect customer satisfaction.

Customer satisfaction reflects the extent to which service performance meets or exceeds expectations (Kotler et al., 2014). It is widely recognised as a key service quality outcome and a strong predictor of behavioural intention (Kar, 2016). In the Malaysian CEP context, satisfaction also functions as an indicator of PAKEJ+ effectiveness in enhancing service quality and user experience. Accordingly:

H9: Customer satisfaction has a positive effect on re-use intention with courier services in Malaysia.

The research framework is presented in Figure 1.

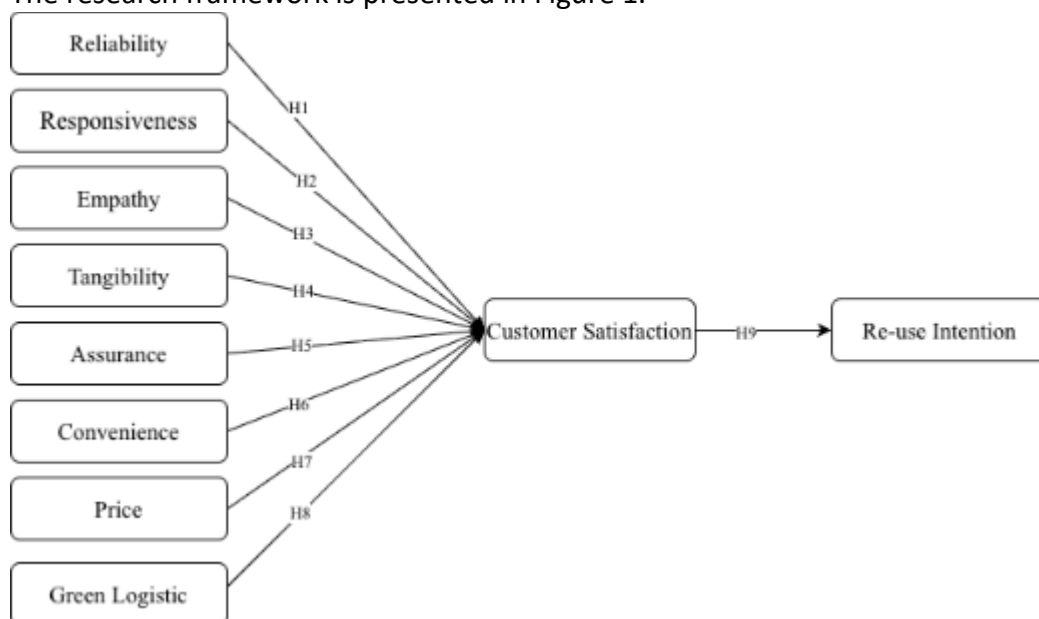


Figure1. The Framework of Research

Methodology

This study seeks to empirically identify and validate the key determinants of re-use intention among users of Malaysia's courier, express, and parcel industry. Guided by a positivist research paradigm, the study adopts a quantitative approach to test hypothesised relationships within a structured theoretical framework (Alharahsheh & Pius, 2020). A cross-sectional survey design was employed, with data collected through structured questionnaires and analysed using statistical techniques to evaluate the proposed hypotheses.

Target Population and Sampling Design

The target population comprised individual consumers with prior experience using CEP services. A purposive sampling strategy was implemented to ensure respondents had relevant experience with the service. Data collection was conducted across the northern, central, and southern regions of Malaysia, encompassing ten major cities, including Selangor, Negeri Sembilan, and Penang. These regions represent areas with high concentrations of CEP infrastructure, according to MCMC data.

The minimum required sample size was calculated using G*Power, which indicated that 146 responses were necessary to achieve adequate statistical power. Considering the broader research design and the need to support regional comparisons, the final target sample size was set at 438 respondents.

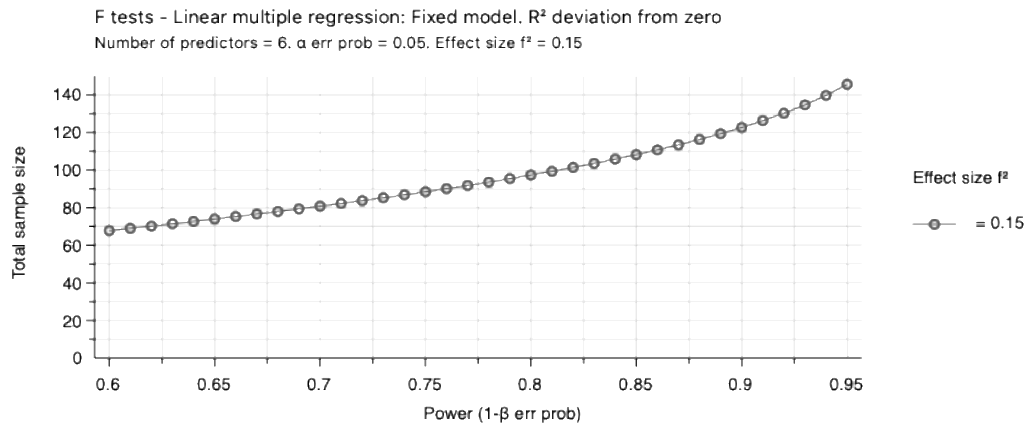


Figure 2. The Result of G*Power

Data Collection Procedure

Data were collected through an online questionnaire administered via Google Forms between 10 and 24 October 2025. To ensure data quality, a rolling screening procedure was implemented during the collection period. Responses were reviewed in real time, and invalid entries were excluded, including duplicate IP addresses, patterned or inattentive responses, questionnaires completed within an unusually short duration, and submissions originating from non-target regions.

A total of 503 responses were initially obtained. After data cleaning, 482 valid questionnaires were retained for analysis. The final sample size exceeded the predetermined target, thereby enhancing the statistical robustness of subsequent analyses.

Measurement Scale

Measurement items for each construct were adapted from established studies, with detailed sources reported in Table 1. All constructs were measured using a five-point Likert scale.

Table 1

The sources of the measurement items

No.	Constructs	Number of items	Source
1	Reliability (REL)	5	Yaacob and Yaacob (2022)
2	Responsiveness (RES)	4	Valaei et al. (2016)
3	Empathy (EMP)	5	Yaacob and Yaacob (2022)
4	Tangibility (TAN)	4	Libo-On (2021)
5	Assurance (ASS)	4	Libo-On (2021)
6	Convenience (CON)	5	Valaei et al. (2016)

7	Price (Price)	5	Siali et al. (2018)
8	Green Logistics (GL)	6	Kawa and Pierański (2021); Shyu et al. (2023)
9	Customer Satisfaction (CS)	5	Siali et al. (2018)
10	Re-use Intention (RI)	5	Lin et al. (2023)
11	Total	48	

Data Analysis Strategy

Statistical analyses were conducted using SPSS version 28.0 and SmartPLS version 4.0. SPSS was initially used for data screening and cleaning, followed by descriptive analyses and preliminary multivariate testing. Given that the research model is prediction-oriented rather than confirmatory, and considering the robustness of partial least squares structural equation modelling (PLS-SEM) in handling non-normal data distributions (Ramayah et al., 2018), SmartPLS was employed to evaluate both the measurement and structural models (Ringle et al., 2022). The analysis proceeded in two stages.

In the first stage, the measurement model was assessed. Following descriptive and reliability analyses, PLS-SEM was used to examine composite reliability (CR), average variance extracted (AVE), and the heterotrait–monotrait ratio (HTMT) to establish convergent and discriminant validity. In the second stage, the structural model and hypothesised relationships were evaluated after confirming satisfactory measurement properties. A bootstrapping procedure with 10,000 resamples was applied to test the significance of path coefficients using p-values. Coefficients of determination (R^2) and effect sizes (f^2) were further analysed to assess explanatory power and the relative contribution of antecedent variables.

Ethical Considerations

This study complied with the ethical principles of the Declaration of Helsinki, as adopted and amended by the World Medical Association. Participation was voluntary and limited to individuals capable of providing informed consent. Participants were informed of their rights before completing the questionnaire. The study examined behavioural perceptions only and did not involve experimental interventions with human subjects or animals. No personally identifiable or sensitive information, including names, contact details, or residential addresses, was collected.

The Results

The Demographic Profile

The final sample consisted of 482 valid responses. Overall, respondents were predominantly young and female, with students representing the largest occupational group. The key demographic characteristics are summarised below. Regarding gender, 73% of respondents were female ($n = 354$), while 27% were male ($n = 128$). The age distribution was concentrated in younger cohorts. Respondents aged 18–24 accounted for 72% ($n = 347$), followed by those aged 35–44 (7.7%), 55+ (7.5%), 25–34 (6.6%), and 45–54 (6.2%). Regarding occupation, students comprised 72.6% of the sample ($n = 350$), followed by public or government sector employees (10.4%), private-sector employees (8.7%), retirees (3.9%), self-employed individuals (3.1%), and homemakers (0.8%).

Table 2

The Details of Profile

Demographic	Frequency	Per cent (%)
Gender		
Female	354	73
Male	128	27
Total	482	100
Age	Frequency	Per cent (%)
18-24	347	72
25-34	32	6.6
35-44	37	7.7
45-54	30	6.2
55 years and above	36	7.5
Total	482	100
Occupation	Frequency	Per cent (%)
Agent	1	0.2
Homemaker	5	1.1
Private sector employee	42	8.7
Public/Government sector employee	50	10.4
Retired	19	3.9
Self-employed	15	3.1
Student	350	72.6
Total	482	100

Geographically, respondents were distributed across three major regions: the North (Penang, Kedah, Perlis, Perak), the Central (Kuala Lumpur, Selangor, Putrajaya), and the South (Negeri Sembilan, Melaka, Johor). The Central region accounted for 165 respondents, followed by the South with 201 and the North with 116. The distribution indicates a higher concentration of respondents in the Central and Southern regions, where logistics activities and parcel delivery volumes are generally more substantial.

Table 3

The Area of Profile

Area	City	Responses	Total
North	Penang	58	116
	Kedah	24	
	Perlis	12	
	Perak	22	
Central	Kuala Lumpur	9	165
	Selangor	143	
	Putrajaya	13	
South	Negeri Sembilan	133	201
	Melaka	22	
	Johor	46	
Total		482	482

Income distribution indicates that 46.9 per cent of respondents reported earning less than RM 2,500 per month, while 31.3 per cent chose not to disclose their income. The remaining respondents reported monthly incomes of RM 5,001–RM 10,000 (8.9 per cent), RM 2,501–RM 5,000 (6.6 per cent), and above RM 10,000 (6.2 per cent).

Table 4

The Monthly Income of Profile

Monthly Income (in Ringgit Malaysia)		
Items	Frequency	Percent
Less than RM 2,500	226	46.9
More than RM 10,000	30	6.2
Prefer not to say	151	31.3
RM 2,501 – RM 5,000	32	6.6
RM 5,001 – RM 10,000	43	8.9
Total	482	100

In terms of usage frequency, 40 per cent of respondents reported using courier services a few times per month, while 28.6 per cent used them only when needed. Additionally, 16 per cent used courier services several times per week, 13.3 per cent once per week, and 2.1 per cent daily or almost daily.

Table 5

The Frequency of Use

How often do you use courier or parcel services? (Please choose ONE only)		
Items	Frequency	Percent
A few times a month	193	40
About once a week	64	13.3
Daily or almost daily	10	2.1
Rarely / only when needed	138	28.6
Several times a week	77	16
Total	482	100

Overall, the demographic profile indicates that the sample is predominantly female and young, with a high proportion of respondents residing in major urban areas and reporting regular use of courier services. These characteristics provide contextual background for the subsequent empirical analyses.

Common Method Variance (CMV)

Common method variance refers to systematic measurement error attributable to the use of a single data collection method (Richardson et al., 2009). In survey-based studies in which both independent and dependent variables are collected from the same respondents at a single point in time, CMV may pose a concern (Podsakoff et al., 2003; Kock et al., 2021).

To assess the potential impact of CMV, a marker variable approach was adopted (Lindell & Whitney, 2001). Specifically, a three-item marker construct adapted from Oreg (2003) was included in the questionnaire. The comparison of R^2 values before and after controlling for the marker variable indicated differences ranging from 0% to 1%. As the changes in R^2 were

well below the commonly accepted threshold of 10%, the results suggest that common method variance does not substantially affect the findings of this study.

Assessment of the Measurement Model

The measurement model was evaluated for convergent and discriminant validity. Convergent validity was assessed using average variance extracted (AVE), and reliability was evaluated through composite reliability (CR). As reported in Table 6, all AVE values exceeded the recommended threshold of 0.50, and all CR values were above 0.70, indicating satisfactory convergent validity and internal consistency reliability (Hair & Alamer, 2022; Ramayah et al., 2018).

Discriminant validity was examined using the heterotrait–monotrait ratio (HTMT) criterion proposed by Franke and Sarstedt (2019). As shown in Table 7, most HTMT values were below the recommended threshold of 0.90. However, three construct pairs exceeded 0.90: customer satisfaction and re-use intention (0.937), reliability and responsiveness (0.917), and empathy and responsiveness (0.939).

To further assess discriminant validity, a 90% bootstrap confidence interval was generated for the HTMT estimates. All upper confidence interval limits were below 1.00. Following the guidelines of Franke and Sarstedt (2019), these results indicate that discriminant validity is established and poses no concern for the measurement model.

Table 6

The Measurement Model

Constructs	Items	Outer Loadings	CR	AVE
Assurance	ASS1	0.880	0.916	0.798
	ASS2	0.912		
	ASS3	0.911		
	ASS4	0.869		
Convenience	CON1	0.813	0.904	0.718
	CON2	0.831		
	CON3	0.843		
	CON4	0.887		
Customer Satisfaction	CON5	0.862	0.948	0.828
	CS1	0.908		
	CS2	0.925		
	CS3	0.902		
Empathy	CS4	0.907	0.911	0.737
	CS5	0.907		
	EMP1	0.856		
	EMP2	0.866		
	EMP3	0.875	0.898	0.714
	EMP4	0.835		
	EMP5	0.859		
	GL1	0.852		

Green Logistics	GL2	0.849		
	GL3	0.796		
	GL4	0.880		
Price	PRICE1	0.912		
	PRICE2	0.905		
	PRICE3	0.901	0.927	0.766
	PRICE4	0.827		
	PRICE5	0.827		
Reliability	REL1	0.837		
	REL2	0.817		
	REL3	0.828	0.883	0.676
	REL4	0.777		
	REL5	0.852		
Responsiveness	RES1	0.864		
	RES2	0.872		
	RES3	0.868	0.884	0.734
	RES4	0.823		
Re-use Intention	RI1	0.896		
	RI2	0.909		
	RI3	0.930	0.947	0.823
	RI4	0.887		
	RI5	0.912		
Tangibility	TAN1	0.846		
	TAN3	0.900	0.855	0.776
	TAN4	0.896		

Note: The TAN 2 (0.646) was deleted due to low loading.

Table 7

Discriminant Validity (HTMT)

	ASS	CON	CS	EMP	GL	PRICE	REL	RES	RI	TAN
ASS										
CON	0.845									
CS	0.819	0.845								
EMP	0.797	0.724	0.724							
GL	0.638	0.657	0.728	0.617						
PRICE	0.733	0.720	0.767	0.752	0.661					
REL	0.736	0.791	0.740	0.833	0.500	0.708				
RES	0.749	0.741	0.724	0.939	0.606	0.744	0.917			
RI	0.798	0.869	0.937	0.722	0.694	0.772	0.751	0.737		
TAN	0.870	0.863	0.817	0.763	0.730	0.719	0.773	0.760	0.821	

Assessment of the Structural Model

The structural model was evaluated using a bootstrapping procedure with 10,000 resamples to generate percentile bootstrap confidence intervals, following the recommendations of

Becker et al. (2023) due to the absence of multivariate normality. As illustrated in Figure 3, the coefficients of determination (R^2) for Customer Satisfaction and Re-use Intention were 0.750 and 0.789, respectively. These values indicate substantial explanatory power, with the model accounting for 75.0% of the variance in customer satisfaction and 78.9% of the variance in re-use intention.

With respect to the hypothesised relationships, Reliability ($\beta = 0.124$, $p < 0.05$), Assurance ($\beta = 0.206$, $p < 0.05$), Convenience ($\beta = 0.255$, $p < 0.05$), Price ($\beta = 0.173$, $p < 0.05$), and Green Logistics ($\beta = 0.232$, $p < 0.05$) were positively associated with Customer Satisfaction. In contrast, Responsiveness, Empathy, and Tangibility did not demonstrate statistically significant effects. Accordingly, H1, H5, H6, H7, and H8 were supported, whereas H2, H3, and H4 were not supported. Customer Satisfaction exhibited a strong positive relationship with Re-use Intention ($\beta = 0.888$, $p < 0.05$), thereby supporting H9 (see Table 8).

To further assess predictive performance, a PLS-Predict procedure was conducted using 10-fold cross-validation with 10 repetitions, following Shmueli et al. (2019). As reported in Table 9, the PLS model's root mean square errors were lower than those of the linear model for four of five indicators, indicating medium out-of-sample predictive capability.

Table 8

The Hypotheses Testing

Hypothesis	Relationships	Std. Beta	Std. Dev.	T values	P values	PCL LL	PCL UL	f^2	Decision
H1	REL -> CS	0.124	0.053	2.321	0.010	0.038	0.213	0.017	Supported
H2	RES -> CS	-0.013	0.059	0.221	0.412	0.112	0.082	0.000	Not Supported
H3	EMP -> CS	-0.019	0.052	0.360	0.359	0.103	0.067	0.000	Not Supported
H4	TAN -> CS	0.062	0.048	1.276	0.101	0.021	0.139	0.005	Not Supported
H5	ASS -> CS	0.206	0.048	4.314	0.000	0.128	0.285	0.047	Supported
H6	CON -> CS	0.255	0.050	5.088	0.000	0.175	0.339	0.076	Supported
H7	PRICE -> CS	0.173	0.044	3.946	0.000	0.1	0.243	0.048	Supported
H8	GL -> CS	0.232	0.041	5.596	0.000	0.166	0.303	0.103	Supported
H9	CS -> RI	0.888	0.016	56.735	0.000	0.861	0.912	3.748	Supported

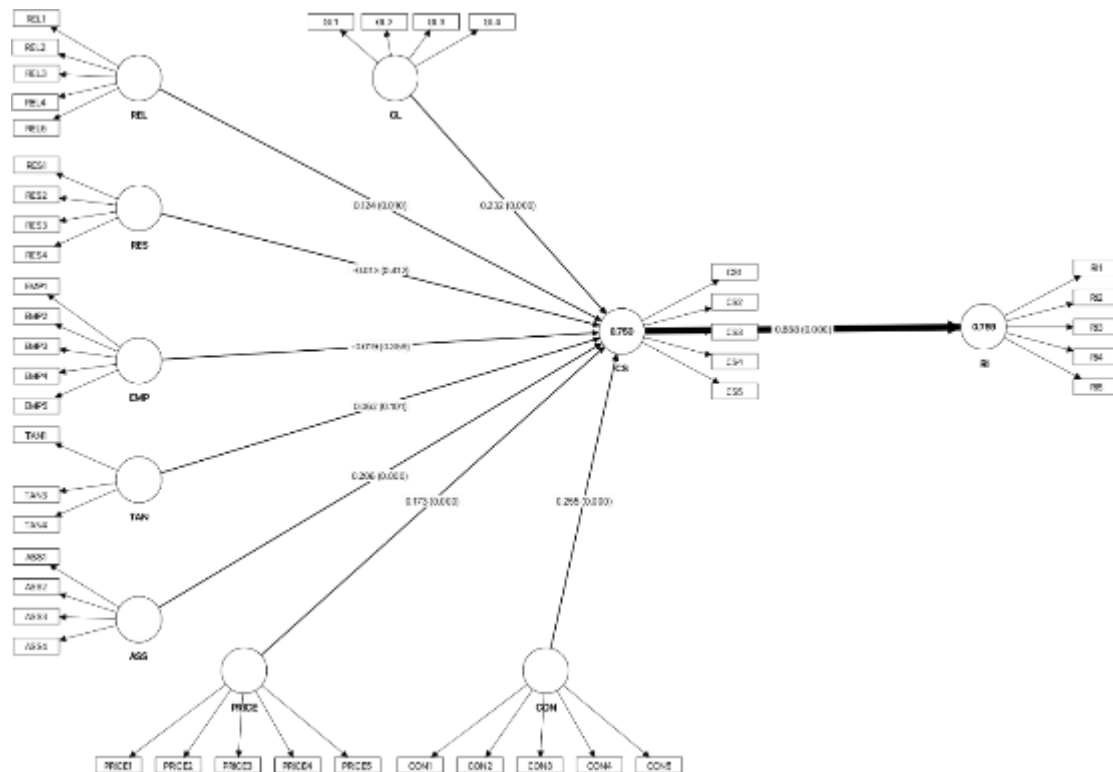


Figure 3. Assessment of Structural Model

Table 9

The PLS-predict

Items	Q ² predict	PLS-SEM_RMSE	LM_RMSE	IA_RMSE	PLS-LM	PLS-IA
RI1	0.580	0.705	0.704	1.088	0.001	-0.383
RI2	0.561	0.737	0.761	1.112	-0.024	-0.375
RI3	0.616	0.693	0.730	1.118	-0.037	-0.425
RI4	0.585	0.793	0.837	1.231	-0.044	-0.438
RI5	0.630	0.727	0.753	1.194	-0.026	-0.467

Discussion

This study extends the SERVQUAL framework by incorporating convenience, price, and green logistics to examine end users of Malaysia's CEP industry. The findings indicate that reliability, assurance, convenience, price, and green logistics significantly enhance customer satisfaction, which in turn strongly predicts re-use intention. These results reinforce prior research highlighting customer satisfaction as a central explanatory mechanism linking service quality to behavioural intention (Kusumawardani & Hastayanti, 2020; Sivadas & Baker-Prewitt, 2000).

Notably, the pattern of significant effects suggests a reconfiguration in the relative salience of service dimensions within a B2C-dominated e-commerce environment. Reliability and assurance remain foundational predictors of customer satisfaction, consistent with studies emphasising fulfilment accuracy, consistency, and professional credibility in courier service evaluation (Jamal et al., 2018; Kusumawardani & Hastayanti, 2020). In high-frequency delivery contexts, users increasingly depend on predictable, error-free performance, underscoring the centrality of these dimensions.

Convenience also exerts a significant positive influence, aligning with research highlighting accessibility and process simplicity as critical determinants of satisfaction (Tang et al., 2022; Lin et al., 2023). In digitally mediated service environments, seamless booking, tracking, and collection processes appear to function as essential evaluative criteria. The positive effect of price further suggests that perceived value plays a decisive role in satisfaction formation, particularly in repeated usage contexts, echoing Lei et al. (2022).

Green logistics emerges as a significant predictor of customer satisfaction, supporting evidence that environmentally responsible practices enhance perceived service value (Kawa & Pierański, 2021; Fan et al., 2025). The findings suggest that sustainability attributes are increasingly integrated into users' evaluative frameworks rather than functioning solely as symbolic corporate initiatives.

In contrast, responsiveness, empathy, and tangibility do not demonstrate significant effects. This pattern may indicate that, in highly standardised, platform-based service systems, certain traditional service dimensions operate as baseline expectations rather than as differentiating factors. As suggested by Valaei et al. (2016), once service attributes become institutionalised norms, their marginal explanatory power may diminish.

Customer satisfaction demonstrates a strong positive effect on re-use intention, consistent with established findings in service research (Kusumawardani & Hastayanti, 2020; Sivadas & Baker-Prewitt, 2000). Within the CEP context, re-use intention captures users' continued engagement with service providers and reflects competitive positioning in digitally mediated markets. In this regard, customer satisfaction functions as a central mechanism linking multidimensional service attributes to sustained behavioural outcomes. The findings suggest that improvements in service quality and sustainability-related practices translate into continued usage primarily through their impact on customer satisfaction.

Theoretical Implications

This study refines and contextualises the service quality–customer satisfaction–behavioural intention framework within the CEP industry. By integrating traditional SERVQUAL dimensions with extended attributes such as convenience, price, and green logistics, the findings demonstrate that customer satisfaction is shaped by differentiated service attributes, with their relative influence varying across digital and high-frequency usage environments. Rather than assuming uniform effects across dimensions, the results support a context-contingent understanding of service quality formation.

The non-significant effects of responsiveness, empathy, and tangibility provide further insight into SERVQUAL's contextual applicability. In highly platformised and standardised logistics systems, certain service dimensions may function as baseline expectations rather than differentiating predictors of satisfaction. This finding suggests that the explanatory power of classical service quality constructs may diminish once operational standardisation becomes institutionalised, reinforcing the importance of context-sensitive testing of service quality frameworks.

The study confirms the structurally central role of customer satisfaction in linking multidimensional service attributes to re-use intention. In CEP settings characterised by

frequent transactions and platform dependence, satisfaction remains the primary mechanism through which service experiences are translated into continued usage. This reinforces the structural robustness of the satisfaction–behavioural intention pathway within digitally mediated service systems.

Furthermore, incorporating green logistics extends the conceptual scope of service value evaluation in CEP research. The findings indicate that environmentally responsible practices are not merely symbolic signals but form part of users’ evaluative criteria. This contributes to an emerging stream of research that integrates sustainability attributes into mainstream service quality models.

Finally, by focusing on Malaysia as an emerging digital commerce market, the study underscores the importance of the market development stage and regional context in shaping user evaluation patterns. The findings highlight the need for greater contextual calibration when applying established service quality frameworks across diverse institutional environments.

Managerial Implications

The findings yield several implications for CEP firms operating in competitive and platform-based markets. First, reliability and assurance remain core drivers of customer satisfaction. Investment in process stability, service standardisation, and workforce competence should therefore be prioritised, as continued use appears to be grounded primarily in operational credibility.

Second, the significant effects of convenience and price underscore the importance of perceived efficiency and value alignment in high-frequency usage contexts. Firms should optimise digital interfaces, network accessibility, and delivery coordination while ensuring pricing structures reflect service consistency and ease of use rather than relying solely on price competition.

Third, the positive impact of green logistics suggests that sustainability initiatives can function as differentiating service attributes. Embedding environmentally responsible practices into visible service processes may enhance perceived value and strengthen customer satisfaction. Fourth, the non-significant effects of responsiveness, empathy, and tangibility suggest that incremental improvements in baseline service attributes may yield diminishing returns in highly standardised environments. Managerial resources may therefore be more effectively allocated toward maintaining core operational reliability and preventing service failures rather than overextending peripheral enhancements.

Finally, given the strong mediating role of customer satisfaction, sustained user retention depends on systematically enhancing overall satisfaction rather than targeting isolated service dimensions. Strategic focus on integrated service performance remains critical for long-term competitiveness in increasingly homogenised CEP markets.

Conclusion

This study investigates end users of Malaysia’s courier, express, and parcel industry and empirically examines the determinants of re-use intention. By developing and testing an

integrated framework that incorporates service quality dimensions, extended service attributes, customer satisfaction, and behavioural intention, the study clarifies how service evaluations translate into sustained usage behaviour.

The findings indicate that service attributes exert differentiated effects on customer satisfaction. Reliability, assurance, convenience, price, and green logistics significantly enhance satisfaction, whereas several traditional SERVQUAL dimensions do not demonstrate significant influence in the present context. This pattern suggests a recalibration of service evaluation criteria in digitally mediated, platform-based logistics environments. Customer satisfaction is confirmed as a structurally central construct linking multidimensional service attributes to re-use intention, reinforcing its pivotal role in continued usage decisions.

Theoretically, the study contributes to service research by contextualising and extending the SERVQUAL framework within the CEP sector. It highlights the importance of evaluating service quality through context-contingent lenses rather than assuming universal dimensional effects. By incorporating sustainability-related attributes into the service quality structure, the study also broadens conceptualisations of logistics service value. Focusing on an emerging e-commerce market, the findings offer empirically grounded insights into behavioural mechanisms operating within digital logistics systems.

Overall, the results suggest that perceptions of operational stability, credibility, convenience, and integrated value primarily shape re-use intention in CEP services. These insights provide a foundation for future research examining service evaluation dynamics across different market settings and digital service models.

Limitations and Directions for Future Research

Despite its contributions, this study has several limitations that warrant consideration and provide directions for future inquiry.

First, the use of cross-sectional survey data limits causal inference. Although appropriate for theory testing within structural equation modelling, longitudinal or experimental designs would enable future research to capture the dynamic interplay between service experiences, satisfaction formation, and continued usage behaviour.

Second, the study focuses exclusively on end users within the Malaysian CEP market. While this context offers valuable insights into service evaluation in an emerging digital economy, the transferability of the findings to other institutional environments or markets at different developmental stages remains uncertain. Cross-national or comparative studies could assess the robustness of the proposed framework across diverse service ecosystems.

Third, although the model integrates multiple service quality and extended attributes, additional factors may further refine the understanding of user decision processes. Future research could incorporate user heterogeneity variables, such as usage intensity, platform dependence, and service channel preferences, as well as platform-level characteristics, to examine differentiated mechanisms across user segments.

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