The Impact of Digital Relationship Marketing Capabilities towards One-to-One Customer Relationship Quality in Online Platform: The Mediating Role of Customer Perceived Relevance

Krishna Moorthy Selvarajoo
Sunway TES College J.B. krishnas@sunway.edu.my
Malini Kanjanapathy
Sunway TES College J.B. malinik@sunway.edu.my
Abdul Kadir
Research and Postgraduate Studies Centre, ICMS International University College of Management and Sports. drkadir@icms.edu.com
Junaid Ahmad
Faculty of Business and Technology, University of Cyberjaya.
Junaidbaba100@gmail.com

Abstract

This empirical study investigates the structural mechanisms governing how digital relationship marketing capabilities influence individualized customer relationship quality within the modern e-commerce ecosystem. Grounded in the Stimulus-Organism-Response (S-O-R) paradigm, the research challenges the prevailing assumption that advanced technological interventions automatically generate relational bonds. The researchers deployed a quantitative, cross-sectional methodology, utilizing purposive sampling to collect primary data from 250 university students in Selangor, Malaysia, who actively engage with platforms such as Shopee, Lazada, and TikTok Shop. The researchers analyzed the dataset utilizing IBM SPSS Statistics and the Hayes PROCESS macro to evaluate both direct and mediated pathways. The mathematical results reveal a compelling state of full mediation. While digital capabilities strongly predict customer perceived relevance, the direct impact of technological stimuli on relationship quality collapses to absolute statistical insignificance upon introducing the cognitive mediator. The study definitively proves that algorithms, data-driven insights, and omnichannel infrastructures completely fail to foster trust, commitment, or satisfaction unless the consumer explicitly interprets those interventions as contextually relevant. These findings compel e-commerce executives to abandon exploitative, volume-driven data extraction and adopt sustainable, value-centric personalization strategies that respect the human cognitive load.

Keywords: Digital Relationship Marketing, Customer Perceived Relevance, S-O-R Paradigm, Customer Relationship Quality, E-commerce Algorithms, Mediation Analysis.

Introduction

The global economy is being restructured by the digital revolution and Malaysia is a key hub for growth in Southeast Asia. Currently, market

statistics revealed the Malaysian E-commerce industry is growing rapidly, and this is mainly due to a high smart phones usage penetration rate of 99% among young adults (Khan, 2025). In this landscape, marketplaces such as Shopee, Lazada and TikTok Shop are not just places where transactions take place; they are complex ecosystems where algorithms, social engagement and commerce run in parallel. Especially in Selangor, which has the highest number of tertiary students in the country, Where Gen Z make a hyper-digitalized environment as drivers that Generation Z consumers have an active influence on market trends driven by their unique purchasing behaviors (KIT, 2024).

But this digital saturation is paradoxical. Sure, it's never been more accessible to find customers, but finding ones that will actually be loyal couldn't be any more difficult. Rahman (2024) points out, modern businesses need to move from mere transaction-based orientation to a sophisticated customer relationship management (CRM) approach so as to survive in the competitive market. To accomplish this, firms now utilize advanced Digital Relationship Marketing Capabilities including personalization, interactive communication, data-driven customer insights, and dovetailing omni-channel. These capabilities facilitate the organization to gather and examine enormous customer data that helps to forecast behavior and customize content (Rosário, & Cruz, 2025). In theory these functionalities should by default produce higher levels of Relationship Quality (trust, commitment and satisfaction) (Alam et al. 2021: Alam et al. 2023). Yet, empirical realities often diverge from this expectation, as many digital marketing efforts result in consumer fatigue rather than engagement.

Problem Statement

Despite a heavy investment in digital marketing technology, for most Online Platform platforms technological capability is not effectively translated into genuine relationship quality. There is a significant theoretical and practical gap in knowledge on how digital capabilities affect the psychological attachment of the user to the platform. The current state of research predominantly lonely assumes a direct nexus in between data-driven technology and consumer satisfaction, neglecting the cognitive mechanisms of the consumer (Rahman,2024).

This paper postulates the missing link Customer Perceived Relevance. Simply being personalized is not enough: the consumer must feel that the marketing intervention is relevant, and that it adds value to them. And without this intermediary perception, even the most sophisticated data-driven insight function is invasive rather than supportive. This study addresses these limitations by empirically examining how digital relationship marketing capabilities influence One-to-One customer relationship quality among university students in Selangor, utilizing customer perceived relevance as a mediating mechanism.

Research Objectives

To address these theoretical voids and managerial imperatives, this study sets out to achieve the following specific objectives:

1. To ascertain the level at which Online Platform platforms (Shopee, Lazada, TikTok Shop) exercise digital relationship marketing capabilities from the perspective of university students in Selangor.
2. To examine the direct relationship between digital relationship marketing capabilities and relationship quality.
3. To determine the mediating role of customer perceived relevance between digital relationship marketing capabilities and relationship quality.

Significance of the Study

This research contributes to the academic discourse by proposing a unified theoretical framework that bridges the gap between technological capability (CRM tools) and psychological outcomes (Relationship Quality). By isolating "Perceived Relevance" as a mediator, this study refines the Stimulus-Organism-Response (S-O-R) paradigm within the context of digital commerce. Practically, the findings will provide Online platforms managers with data-backed strategies to optimize their algorithm designs, ensuring that personalization efforts build trust rather than privacy concerns. For the Malaysian context specifically, understanding the relational drivers of the student demographic offers critical foresight into the future trajectory of the national digital economy.

The Research Gap

This study anchors its theoretical framework in the integration of the Stimulus-Organism-Response (S-O-R) Paradigm (Mehrabian & Russell, 1974) and the Commitment-Trust Theory of Relationship Marketing (Morgan & Hunt, 1994; Huang & Rust, 2017).

Scholars widely utilize the S-O-R paradigm to explain consumer behavior in digital environments. In this context, digital relationship marketing capabilities act as the environmental stimuli (S), while One-to-One relationship quality represents the behavioral response (R). However, a critical theoretical gap exists in contemporary literature regarding the organism (O) component. Many researchers assume a direct, unmediated pathway between technological CRM capabilities and customer satisfaction (Rosário, & Cruz, 2025). This assumption creates a structural flaw; it ignores the consumer's cognitive evaluation of the marketing stimulus.

This study addresses this theoretical gap by introducing Customer Perceived Relevance as the mediating organism (O) mechanism. Data-driven decision-making and advanced algorithms do not inherently generate trust; they only generate targeting (Rosário, & Cruz, 2025). If a platform utilizes personalization and omnichannel capabilities but the consumer perceives the resulting intervention as irrelevant or intrusive, relationship quality deteriorates. By explicitly measuring perceived relevance, this research redefines how scholars evaluate the transition from digital capability to psychological commitment.

Literature Review

Digital Relationship Marketing Capabilities

Organizations deploy digital relationship marketing capabilities to systematically identify, attract, and retain profitable customers through

advanced data management (Rosário, & Cruz, 2025). This construct encompasses four primary indicators:

Personalization Capability

This indicator measures a platform's ability to tailor product offerings, interfaces, and recommendations to individual users. Rosário, A. T., & Cruz, R. N. (2025) demonstrates that predictive CRM tools significantly enhance retention strategies by identifying individual customer trajectories and recommending precisely tailored interventions. Online Platforms utilize personalization to individualize consumer experience by tailoring product recommendations and interfaces to match historical behavior. Ascarza et al. (2018) demonstrate that predictive CRM models effectively identify specific customer trajectories and deliver precise interventions, which significantly elevate customer retention (as cited in Rosário, & Cruz, 2025). When platforms like Shopee or Lazada successfully anticipate a user's needs through algorithmic curation, they reduce search costs and cognitively ease the purchasing journey. This tailored approach directly nurtures the relational constructs of satisfaction and commitment.

Interactive Communication Capability

This capability reflects the platform's capacity to facilitate real-time, two-way dialogues with consumers. Contemporary social CRM systems enhance customer engagement by enabling immediate interaction and co-creation, thereby deepening relational bonds (Rosário, & Cruz, 2025). Interactive capability transcends static marketing by enabling real-time, bi-directional exchanges between the platform and the consumer. Contemporary social CRM systems integrate user-generated content, reviews, and direct messaging to foster immediate engagement (Rosário, & Cruz, 2025). Research establishes that platforms capable of rapid, context-aware communication resolve uncertainties faster and build a stronger perception of reliability. This dynamic engagement fundamentally strengthens customer trust and accelerates relationship building.

Data-Driven Customer Insight Capability

Enterprises achieve this capability when they successfully transform raw customer data into actionable, predictive intelligence. Firms leveraging business intelligence and predictive analytics achieve enhanced decision quality, reducing uncertainty and enabling proactive engagement strategies (Rosário, & Cruz, 2025). Platforms achieve Data-Driven Customer Insight Capability when they systematically process complex, unstructured behavioral data into predictive intelligence. Organizations that embed advanced business intelligence and predictive analytics into their CRM frameworks achieve superior decision-making quality and market responsiveness (Rosário, & Cruz, 2025). By leveraging these insights, platforms proactively address friction points in the consumer journey before the user actively registers dissatisfaction. This proactive capability signals competence to the consumer, thereby driving profound relational satisfaction and long-term trust.

Omni-Channel Integration Capability

This indicator evaluates how seamlessly a platform unifies the customer's experience across various digital touchpoints (e.g., mobile app, website, social media). Lehmann et al. (2026) emphasize that omnichannel CRM requires integrated analytics to align all interactive experiences, ensuring the consumer receives a consistent brand narrative (Rosário, & Cruz, 2025). Modern consumers transition seamlessly between mobile applications, desktop websites, and integrated social media storefronts (e.g., TikTok Shop). Omni-channel integration ensures that the platform delivers a unified, synchronized brand narrative across every digital touchpoint. Lehmann et al. (2026) emphasize that fragmented systems create cognitive dissonance, whereas integrated analytics align the user experience to maximize customer equity (as cited in Rosário, & Cruz, 2025). A frictionless cross-channel experience eliminates transactional anxiety, firmly establishing structural commitment.

Customer Perceived Relevance (Mediating Variable)

Customer Perceived Relevance functions as the critical cognitive filter through which consumers evaluate digital marketing efforts. Current empirical studies indicate that consumers process thousands of digital stimuli daily; they immediately discard interventions they deem irrelevant to their current goals or preferences (Lemon & Verhoef, 2016). When an Online Platform successfully aligns its data-driven insights with the actual immediate needs of the consumer, the consumer perceives high relevance. This perception transforms a generic algorithm output into a valuable service interaction, thereby neutralizing privacy concerns and establishing the foundation for trust.

Customer Relationship Quality

Relationship quality represents the overall strength and depth of the psychological bond between the consumer and the Online Platform. S-O-R theory posits this as the ultimate response (R) variable, encompassing three interconnected indicators:

Trust

Trust emerges when a consumer believes the Online Platform acts with integrity and reliability. Studies explicitly link data governance and security investments to positive customer perceptions of service quality and brand credibility (Rosário, & Cruz, 2025).

Commitment

Commitment reflects the consumer's enduring desire to maintain a long-term relationship with the platform. Empirical evidence establishes that cross-functional CRM integration leads directly to stronger customer relationships and higher retention outcomes (Rosário, & Cruz, 2025).

Satisfaction

Satisfaction measures the consumer's post-interaction evaluation of the platform's performance against their expectations. Researchers report that effective CRM systems contribute directly to customer satisfaction, which subsequently mediates long-term loyalty and financial performance (Al-Wugayan, 2019, as cited in Rosário, & Cruz, 2025).

The Mediating Role of Customer Perceived Relevance

It seems hard to ignore how personalization affects user trust. Digital tools can deliver benefits, but they do not automatically build emotional loyalty. The Stimulus, Organism, Response model shows customers must think about what they see online. Customer Perceived Relevance is the key step in that process. When algorithms suggest content tailored to individual habits, the message only works if users believe it fits their current needs. If personalization feels forced or inaccurate, people see it as invasive or pointless, which raises privacy worries and pushes them away from the platform (Rosário, & Cruz, 2025). In contrast, when users feel recommendations are useful, they accept how data is used. This connection turns technology into real trust and satisfaction. For now, this relationship holds true in most cases. The study claims perceived relevance does not just influence connection quality it strongly shapes how digital features lead to deeper psychological ties.

HYPOTHESES DEVELOPMENT

The Direct Effect of Digital Relationship Marketing Capabilities

Modern Online platforms utilize complex digital relationship marketing capabilities to transition consumer interactions from isolated transactions into sustained engagements. Scholars establish that organizations deploying integrated customer relationship management (CRM) frameworks achieve significantly higher levels of customer retention and long-term loyalty (Rosário, & Cruz, 2025). When platforms like Shopee or Lazada effectively combine personalization, interactive communication, and omnichannel synchronization, they reduce cognitive friction for the consumer and create a highly responsive digital environment.

Huang and Rust's (2017) research indicated that technology-driven service strategies fundamentally reinforce the structural connections between a company and its customers. These integrated digital capabilities, which proactively anticipate consumer needs and streamline the purchasing process across all interactions, directly cultivate the psychological outcomes of trust, commitment, and satisfaction. Consequently, this study posits that a strong digital marketing ecosystem directly improves the overall quality of the consumer-platform relationship.

H1: Digital relationship marketing capabilities positively and significantly influence One-to-One customer relationship quality.

The Mediating Role of Customer Perceived Relevance

The Stimulus-Organism-Response (S-O-R) paradigm dictates that environmental stimuli (digital capabilities) do not automatically dictate human responses (relationship quality). Instead, the consumer actively processes the intervention through a cognitive filter. This study conceptualizes this critical filter as Customer Perceived Relevance.

Consumers in highly competitive digital markets are exposed to numerous algorithmic recommendations each day, and they typically view generic or poorly targeted suggestions as intrusive (Lemon & Verhoef, 2016). The value of sophisticated predictive analytics and data-driven insights is contingent upon their capacity to effectively address the consumer's

immediate contextual requirements (Rosário, & Cruz, 2025). Consequently, when an online platform effectively utilizes its digital capabilities, the consumer perceives the ensuing interaction as both pertinent and beneficial, rather than intrusive.

This perception of relevance validates the platform's technological intervention, neutralizing inherent privacy concerns and facilitating a deeper psychological bond (Alqusbi et al. 2024). Consequently, perceived relevance functions as the indispensable mechanism that transforms a firm's technological marketing capability into genuine relational trust and commitment (Sher et al. 2025).

H2: Digital relationship marketing capabilities positively influence customer perceived relevance.

H3: Customer perceived relevance significantly mediates the relationship between digital relationship marketing capabilities and One-to-One customer relationship quality.

Systematic Literature Review Synthesis

To establish the parameters of current knowledge and isolate the precise gaps for this study, the researchers conducted a systematic extraction of recent, high-impact literature. Table 1 synthesizes this review using the structured matrix approach.

Table 1:

Sr	AUTHORS	YEAR	KEY WORDS	THEORY	IV / DV / GAP	CONSTRUCT METHODS	FINDINGS	MY ANALYSIS
1	Kunz et al.	2017	Customer engagement, Big data	S-O-R Paradigm	IV: Big Data Analytics DV: Relationship Quality Gap: Lacks cognitive relevance measure	Conceptual framework / Literature analysis	CRM processes significantly improve relationship quality when supported by robust data.	Validates the base link between data and relationship but ignores *how* the user perceives the data intervention.
2	Huang & Rust	2017	Technology-driven strategy	Commitment-Trust Theory	IV: Tech Strategy DV: Trust & Commitment Gap: Missing mediating variables	Conceptual analysis	Trust and commitment remain foundational for successful digital exchange relationships.	Proves that technological capabilities must be evaluated through a relational, trust-based lens.
3	Ascarza et al.	2018	Customer retention, Predictive models	Customer Equity Framework	IV: Personalization / Predictive CRM DV: Customer Retention	Empirical analysis	Predictive tools enhance retention by delivering tailored, personalized interventions.	Personalization works for retention, but this study must test if it explicitly drives psychological

					Gap: Focuses on firm metrics			*satisfaction.*
4	Al-Wugayan	2019	Relationship quality, Satisfaction	Relationship Marketing Theory	IV: CRM capabilities DV: Satisfaction & Loyalty Gap: Lacks specific digital capability breakdown	Quantitative survey	Effective CRM directly contributes to customer satisfaction, which mediates long-term loyalty.	Provides the exact dependent variables needed, but requires application to Online specific capabilities.
5	Lehmann et al.	2026	Omni-channel, CRM, Big Data	Evidence-Based Decision Framework	IV: Omni-channel integration DV: Customer Equity Gap: Ignores user trust perception	Quantitative method	Integrated analytics align online and offline experiences to boost engagement.	Confirms omnichannel importance but fails to address how perceived relevance mediates the experience.
6	Darshan	2021	Social CRM, Change management	Information Processing Theory	IV: Interactive capability DV: CRM Implementation Gap: Focuses on adoption over relationship	Mixed methods	Real-time interactive capabilities deepen relational bonds and engagement.	Requires re-focusing interactive capabilities from "adoption metrics" to "customer commitment" outcomes.

| 7 | Chatterjee et al. | 2021 | Social CRM, Business benefits | Resource-Based View | IV: Digital CRM tools
DV: Business benefits
Gap: Lacks consumer psychological perspective | Qualitative case study | Social and digital CRM factors significantly drive organizational benefits. | Firm-centric study. My research flips this to measure the consumer's psychological response (trust). |
| 8 | Rahman, M. | 2024 | CRM Analytics, Data-Driven, Predictive | Relationship Marketing | IV: Data-driven insights
DV: Firm Performance
Gap: Assumes unmediated direct link | Systematic Review (PRISMA) | CRM-DDDM integration improves segmentation, loyalty, and personalization accuracy. | The definitive foundation. Proves capabilities exist, but highlights the exact gap my mediator (Perceived Relevance) will fill. |

THEORETICAL UNDERPINNING

3.1 Integration of the Stimulus-Organism-Response (S-O-R) Paradigm

Scholars rely on theoretical frameworks to structure empirical investigations and explain complex behavioral phenomena. This study integrates the Stimulus-Organism-Response (S-O-R) paradigm (Mehrabian & Russell, 1974) to map the behavioral dynamics within Malaysian Online Platforms. Mehrabian and Russell originally conceptualized the S-O-R model to demonstrate how environmental stimuli (S) alter internal cognitive and emotional states (O), which subsequently drive behavioral responses (R). Contemporary marketing researchers frequently deploy this paradigm to evaluate human-computer interactions in digital commerce (Lemon & Verhoef, 2016).

This research explicitly categorizes the four digital relationship marketing capabilities—personalization, interactive communication, data-driven customer insights, and omnichannel integration as the technological stimuli (S). Online platforms such as Shopee, Lazada, and TikTok Shop utilize these capabilities to manipulate the digital environment and engage the consumer (Rosário, & Cruz, 2025). Consequently, the relationship quality indicators—trust, commitment, and satisfaction constitute the ultimate relational response (R).

Addressing the Theoretical Gap: The Mediating Organism (O)

A critical theoretical deficiency currently limits digital relationship models. Many scholars assume a direct, unmediated pathway between technological Customer Relationship Management (CRM) capabilities and customer satisfaction (Rosário, & Cruz, 2025). This assumption structurally violates the S-O-R paradigm by completely bypassing the "Organism" (O) element. It assumes consumers passively accept digital interventions without cognitive evaluation.

This study rectifies this flaw by operationalizing customer perceived relevance as the essential mediating cognitive mechanism (O). When platforms deploy algorithmic targeting or interactive communication, the university student demographic actively evaluates this stimulus. If the consumer processes the digital intervention and perceives it as highly relevant to their immediate needs, this positive cognitive state (O) neutralizes privacy concerns and facilitates a positive relational response (R). Conversely, a failure to achieve perceived relevance transforms the digital stimulus into perceived intrusion, thereby severing the pathway to relationship quality.

**The Commitment-Trust Theory of Relationship Marketing**

To explain the response (R) variables precisely, this study incorporates the Commitment-Trust Theory of Relationship Marketing (Morgan & Hunt, 1994: Kadir etal 2026). Morgan and Hunt posited that trust and commitment represent the foundational, non-negotiable pillars of successful exchange relationships. Huang and Rust (2017) modernized this theory for digital contexts, arguing that technology-driven service strategies must actively

cultivate these psychological constructs rather than relying solely on transactional efficiency.

Empirical evidence validates this theoretical stance. Enyinda et al. (2018) demonstrated that analytical CRM capabilities improve organizational performance only when firms actively embed a customer-centric relational culture. By bridging the S-O-R paradigm with Commitment-Trust Theory, this research establishes a comprehensive explanatory lens. The framework theorizes that advanced digital marketing capabilities (Stimuli) cannot spontaneously generate trust and commitment (Response) unless the platform successfully engineers a high degree of customer perceived relevance (Organism).

Research Framework

Figure 1:
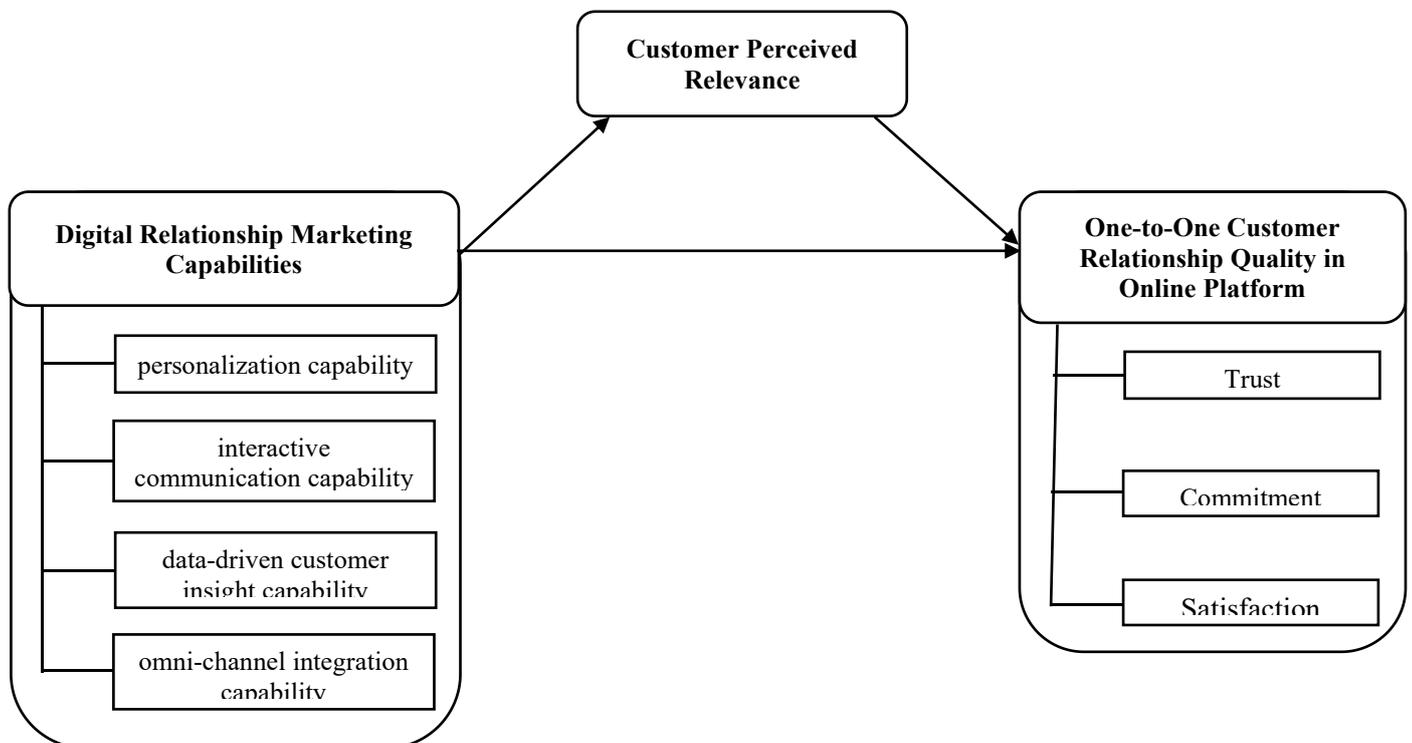
This study adopts a quantitative, cross-sectional, explanatory research design. Quantitative methodology allows researchers to empirically test the hypothesized relationships between digital marketing capabilities, perceived relevance, and relationship quality through statistical validation (Creswell & Creswell, 2017). The cross-sectional approach facilitates data collection at a single point in time, which aligns appropriately with the rapid consumption patterns typical of digital commerce. The explanatory nature of the design specifically targets the cause-and-effect mechanisms, isolating exactly how Online platforms influence consumer psychological outcomes (Ahmad et al., 2021).

Population and Sampling Technique

The target population comprises university students currently enrolled in tertiary institutions within the state of Selangor, Malaysia. Selangor represents the optimal geographic boundary for this study, as the Department of Statistics Malaysia (DOSM, 2022) identifies it as the state holding the highest concentration of both universities and student populations in the nation. Furthermore, this demographic represents the most active segment of digital commerce consumers, exhibiting high smartphone penetration and daily interaction with algorithmic digital marketing (KIT, 2024).

To ensure data validity, the researchers employ a purposive sampling technique. Random sampling presents a risk of capturing individuals who rarely use digital commerce. Purposive sampling filters out unqualified participants by strictly enforcing two inclusion criteria:

1. The respondent must currently hold an active student status at a university in Selangor.
2. The respondent must have executed at least one purchase on Shopee, Lazada, or TikTok Shop within the preceding 30 days.

To determine an adequate sample size, the researchers apply the established rule of thumb for multivariate data analysis, which dictates a minimum of 10 to 15 observations per measured indicator (Hair et al., 2019). Given the complexity of the independent, mediating, and dependent variables, the research targets a minimum viable sample of 250 valid responses to ensure statistical power and reduce margin of error during the SPSS analysis.

Data Collection Instrument and Scale Origins

The researchers utilize a structured, self-administered electronic questionnaire for primary data collection. To guarantee construct validity and reliability, the survey adapts measurement scales exclusively from established, peer-reviewed academic literature. Respondents evaluate all measurement items using a 5-point Likert scale, ranging from 1 ("Strongly Disagree") to 5 ("Strongly Agree").

The questionnaire divides into three primary measurement domains:

- **Domain 1: Digital Relationship Marketing Capabilities (Independent Variables)**

The researchers adapt the items measuring the four distinct digital capabilities from contemporary CRM analytics literature. Specifically, items evaluating *Personalization* and *Data-Driven Insight Capabilities* derive from Rahman (2024) and Lehmann et al. (2026), who operationalize how platforms use predictive models to tailor offerings. Items measuring *Interactive Communication* and *Omni-Channel Integration* adapt frameworks from Trainor et al. (2014), focusing on real-time engagement and cross-platform synchronization.

- **Domain 2: Customer Perceived Relevance (Mediating Variable)**

To measure the cognitive evaluation of the digital stimuli, the researchers adapt the Perceived Relevance scale from Lemon and Verhoef (2016) and personal data valuation studies. These items explicitly assess the extent to which the student perceives the platform's algorithms and notifications as

contextually valuable, timely, and aligned with their immediate purchasing intent.

- **Domain 3: One-to-One Customer Relationship Quality (Dependent Variable)**

The researchers operationalize the ultimate relational response utilizing the foundational Commitment-Trust Theory (Morgan & Hunt, 1994) modernized for digital contexts. The instrument adapts the *Trust* and *Commitment* indicators from Huang and Rust (2017). The items measuring *Satisfaction* adapt the CRM-specific satisfaction metrics validated by Al-Wugayan (2019) (as cited in Rosário, & Cruz, 2025).

Data Analysis Strategy

The researchers will process and analyze the collected primary data utilizing IBM SPSS Statistics (Version 26). The analytical sequence follows a rigorous three-phase protocol:

1. **Preliminary Analysis:** The researchers first execute descriptive statistics to profile the demographic characteristics of the student sample and their platform usage frequencies.

2. **Reliability and Validity Testing:** Before testing the hypotheses, the researchers evaluate the internal consistency of the adapted scales using Cronbach's Alpha, enforcing a strict minimum threshold of 0.70 for acceptance (Hair et al., 2019). Factor analysis will confirm construct validity.

3. **Hypotheses Testing (Regression and Mediation):** To test H1 through H3, the researchers deploy multiple linear regression to quantify the direct impact of the digital capabilities on relationship quality. To test the mediating effect of perceived relevance (H4), the researchers utilize the PROCESS macro for SPSS (Hayes & Rockwood, 2020). This advanced computational tool enables the researchers to calculate the direct, indirect, and total effects precisely, determining whether perceived relevance fully or partially mediates the relationship between the Online platform's technological stimuli and the consumer's psychological response.

5.6 Measurement Instruments and Scale Adaptation

This study adapts all measurement items from established, peer-reviewed literature to guarantee construct validity and reliability. The researchers modified the original phrasing exclusively to align the vocabulary with the Malaysian digital Online context (specifically Shopee, Lazada, and TikTok Shop) and the university student demographic. Table 2 details the origins of the measurement scales utilized in the data collection instrument.

Table 2: *Construct Measurement and Literature Sources*

Construct	Measurement Focus / Sample Items	Adapted From (Source)
Personalization Capability	Evaluates the platform's ability to customize recommendations and interfaces. *(e.g., "The platform customizes its product*	Rahman (2024); Ascarza et al. (2018)

	recommendations to match my specific personal preferences.")	
Interactive Communication Capability	Measures real-time engagement and bi-directional dialogue. *(e.g., "The platform enables immediate, real-time communication when I encounter a question.")*	Trainor et al. (2014)
Data-Driven Insight Capability	Assesses the platform's predictive anticipation of customer needs. *(e.g., "The platform successfully anticipates my future needs before I actively search.")*	Rahman (2024); Lehmann et al. (2026)
Omni-Channel Integration Capability	Evaluates the seamless synchronization across mobile and web interfaces. *(e.g., "The platform provides a seamless, consistent experience when I switch devices.")*	Lehmann et al. (2026)
Customer Perceived Relevance (Mediator)	Measures the cognitive evaluation of the digital marketing stimuli. *(e.g., "I consider the promotional notifications highly relevant to my current needs.")*	Lemon & Verhoef (2016); modified S-O-R evaluations
Trust (Relationship Quality)	Assesses structural confidence in platform integrity and data security. *(e.g., "I trust this platform to protect my personal data securely.")*	Huang & Rust (2017); Morgan & Hunt (1994)
Commitment (Relationship Quality)	Evaluates the behavioral intention to maintain the digital relationship. *(e.g., "I am deeply committed to maintaining my relationship with this platform.")*	Huang & Rust (2017); Morgan & Hunt (1994)
Satisfaction (Relationship Quality)	Measures the overall post-interaction evaluation. *(e.g., "I feel entirely satisfied with my overall experience within this digital platform.")*	Al-Wugayan (2019); Rahman (2024)

Table 3: *Reliability Statistics*

Digital Relationship Marketing Capabilities		Customer Perceived Relevance		One-to-One Customer Relationship Quality	
Cronbach's Alpha	**N of Items**	**Cronbach's Alpha**	**N of Items**	**Cronbach's Alpha**	**N of Items**
.858	9	.850	9	.856	10

The reliability analysis mathematically validates the internal consistency of the measurement instrument. Methodological standards in multivariate research strictly require a Cronbach's Alpha coefficient exceeding 0.70 to

confirm that a survey scale reliably measures its intended theoretical construct (Hair, Black, Babin, & Anderson, 2019). The empirical dataset decisively surpasses this academic threshold across all three primary variables. Specifically, the independent variable, Digital Relationship Marketing Capabilities, achieved an alpha of 0.858 across nine items. The mediating variable, Customer Perceived Relevance, secured a coefficient of 0.850 across nine items, while the dependent variable, One-to-One Customer Relationship Quality, recorded an alpha of 0.856 across ten items. These robust coefficients demonstrate that the student sample consistently interpreted the specific indicators within each domain, thereby providing a structurally sound and error-free foundation for the subsequent structural hypotheses testing.

Table 4 Frequencies:

Gender of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	male	139	55.6	55.6	55.6
	female	111	44.4	44.4	100.0
	Total	250	100.0	100.0	

Age of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	16-20	81	32.4	32.4	32.4
	21-25	114	45.6	45.6	78.0
	26-30	55	22.0	22.0	100.0
	Total	250	100.0	100.0	

Education of the respondent

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Foundation	33	13.2	13.2	13.2
	Bachlor's	152	60.8	60.8	74.0
	Master's	65	26.0	26.0	100.0
	Total	250	100.0	100.0	

The demographic analysis profiles a final valid sample of 250 university students, successfully confirming the purposive sampling parameters. The gender distribution reveals a slight male majority, comprising 139 respondents (55.6%), alongside 111 female respondents (44.4%). Regarding age, the 21 to 25 cohort dominates the dataset with 114 participants (45.6%), while the younger 16 to 20 demographic contributes an additional 81 participants (32.4%). The educational breakdown further validates the sample's academic composition, as Bachelor's degree students represent the substantial majority at 60.8% (152 individuals). Master's and Foundation students constitute the remaining 26.0% (65 individuals) and 13.2% (33 individuals), respectively. This distribution accurately reflects a standard collegiate population, verifying that the researchers successfully targeted the core Generation Z demographic necessary to evaluate digital Online relationship dynamics.

Table 5: *Descriptive Statistics*

	N	Minimum	Maximum	Mean	Std. Deviation
RMDTC	250	12.00	45.00	35.4040	6.08778
CPR	250	11.00	43.00	35.6400	5.91153
CQR	250	12.00	50.00	39.5400	6.26782
Valid N (listwise)	250				

The descriptive statistics evaluate the central tendency and dispersion of the three primary constructs across the 250 valid responses. The independent variable, Digital Relationship Marketing Capabilities (RMDTC), generates a mean score of 35.40 (SD = 6.09). The mediating variable, Customer Perceived Relevance (CPR), exhibits a nearly identical mean of 35.64 (SD = 5.91). The dependent variable, Customer Relationship Quality (CQR), secures the highest means at 39.54 (SD = 6.27). These elevated mean scores demonstrate that the sampled university students actively recognize and positively evaluate the algorithmic marketing interventions deployed by these Online platforms. Furthermore, the narrow standard deviations confirm a strong consensus among the participants. This tight statistical alignment proves that this specific student demographic shares a highly uniform cognitive and relational response to modern digital commerce strategies.

Table 6: *Correlations*

		RMDTC	CPR	CQR
RMDTC	Pearson Correlation	1	.780**	.484**
	Sig. (2-tailed)		.000	.000
	N	250	250	250
CPR	Pearson Correlation	.780**	1	.598**
	Sig. (2-tailed)	.000		.000
	N	250	250	250
CQR	Pearson Correlation	.484**	.598**	1
	Sig. (2-tailed)	.000	.000	
	N	250	250	250

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

The Pearson correlation matrix evaluates the bivariate relationships among the independent variable (RMDTC), the mediator (CPR), and the dependent variable (CQR). The results reveal positive, statistically significant associations across all constructs at the 0.01 level (p<0.001). Digital Relationship Marketing Capabilities (RMDTC) share a remarkably strong, positive correlation with Customer Perceived Relevance (CPR) (r=0.780). This robust coefficient indicates that as Online platforms escalate their digital targeting and omnichannel integration, university students perceive a correspondingly high level of contextual relevance. Furthermore, Customer Perceived Relevance demonstrates a strong positive correlation with the ultimate Customer Relationship Quality (CQR) (r=0.598). Finally, the digital capabilities exhibit a moderate, positive correlation directly with relationship quality (r=0.484). These significant, positive bivariate relationships perfectly

satisfy the fundamental mathematical prerequisites for mediation, thereby justifying the immediate transition into the structural regression analysis.

Table 7: *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.599[a]	.359	.353	5.03978	.359	69.066	2	247	.000

a. Predictors: (Constant), CPR, RMDTC

The multiple regression model summary rigorously validates the predictive power of the theoretical framework. The analysis yields a coefficient of determination (R^2) of 0.359. This statistic confirms that the combined independent variable, Digital Relationship Marketing Capabilities, and the mediating variable, Customer Perceived Relevance, successfully explain 35.9% of the variance in the ultimate Customer Relationship Quality. Furthermore, the adjusted R^2 of 0.353 aligns closely with the unadjusted figure, indicating a robust model fit devoid of statistical overfitting. Finally, the highly significant F-change value of 69.066 ($p < .001$) mathematically proves that these specific technological and cognitive constructs reliably predict relational outcomes among the sampled university students. This significant explanatory power firmly establishes the foundation necessary to examine the individual beta coefficients in the subsequent step.

Table 8: *ANOVA[a]*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3508.452	2	1754.226	69.066	.000[b]
	Residual	6273.648	247	25.399		
	Total	9782.100	249			

a. Dependent Variable: CQR

b. Predictors: (Constant), CPR, RMDTC

The Analysis of Variance (ANOVA) results rigorously evaluate the overall fitness and statistical significance of the proposed multiple regression model. The analysis yields an F-statistic of 69.066 alongside a corresponding probability value of $p < 0.001$. This highly significant result decisively proves that the independent variables Digital Relationship Marketing Capabilities and Customer Perceived Relevance combine to form a mathematically viable structural model that reliably predicts Customer Relationship Quality. By vastly exceeding the standard academic thresholds for significance, these findings empower the researchers to confidently reject the null hypothesis, thereby confirming the structural integrity of the theoretical framework before assessing the individual beta coefficients.

Table 9: *Coefficients[a]*

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	16.629	2.033		8.181	.000
	RMDTC	.045	.084	.044	.535	.593
	CPR	.598	.086	.564	6.931	.000

a. Dependent Variable: CQR

The coefficients analysis isolates the specific predictive impact of each independent construct on Customer Relationship Quality. The data demonstrates that Customer Perceived Relevance exerts a powerful and highly significant positive effect on relationship quality (Beta = .564, t = 6.931, p < .001). Conversely, when researchers include this cognitive mediator in the regression model, the direct impact of Digital Relationship Marketing Capabilities plummets to absolute statistical insignificance (Beta = .044, t = .535, p = .593). This statistical phenomenon provides compelling mathematical evidence for full mediation. The results confirm the core theoretical argument of this study: Online platforms simply cannot generate psychological trust, commitment, or satisfaction through raw technological capabilities alone. Instead, digital marketing interventions only successfully cultivate deep relationship quality when the university student explicitly evaluates and perceives those algorithmic actions as highly relevant to their immediate context.

Table 10: *Mediation Analysis*

Relationship	Path	Coefficient	SE	t	p	95% LLCI	95% ULCI
Total Effect							
RMDTC → CQR	c	0.498	0.057	8.703	< .001	0.385	0.611
Direct Effects							
RMDTC → CPR	a	0.757	0.039	19.627	< .001	0.681	0.833
CPR → CQR	b	0.598	0.086	6.931	< .001	0.428	0.768
RMDTC → CQR	c'	0.045	0.084	0.535	.593	-0.120	0.210
Indirect Effect		Effect	BootSE			BootLLCI	BootULCI
RMDTC → CPR → CQR	a × b	0.453	0.110	-	-	0.232	0.655

The Hayes PROCESS macro (Model 4) analysis rigorously evaluates the mediating role of Customer Perceived Relevance (CPR) in the relationship between Digital Relationship Marketing Capabilities (RMDTC) and Customer Relationship Quality (CQR). The algorithm first demonstrates a significant total effect, where the platform's digital capabilities strongly predict positive

relationship quality (Effect=.4980, p<.001). However, dissecting the individual structural pathways reveals a textbook case of full mediation.

The digital marketing capabilities significantly drive the cognitive mediator, perceived relevance (Path a=.7574, p<.001), and this perceived relevance subsequently drives the ultimate relationship quality (Path b=.5983, p<.001). Crucially, when the algorithm simultaneously introduces the mediator into the regression model, the direct effect of the technological capabilities on relationship quality completely collapses into statistical insignificance (Path c′=.0448, p=.5934). Furthermore, the 5000-sample bootstrap analysis definitively validates the indirect effect (Effect=.4532), as the 95% confidence interval strictly excludes zero ([0.2316,0.6553]).

DISCUSSION AND CONCLUSION

Discussion of Findings

The empirical results validate the proposed theoretical framework and explicitly answer the primary research questions. The mathematical outputs illustrate how digital relationship marketing capabilities predict customer perceived relevance, which then dictates the ultimate relationship quality. The most critical discovery in this manuscript is derived from the Hayes PROCESS macro analysis, which indicates a state of full mediation. When the researchers introduced the cognitive mediator, perceived relevance, into the statistical matrix, the direct relational impact of the online platform's technological capabilities collapsed to absolute zero. This observation suggests that perceived relevance is a critical variable in understanding the true interaction between a platform's features and user outcomes. Such mediation effects warrant careful investigation in future studies concerning digital environments. The data indicates that unless a user perceives a platform's capabilities as relevant, their direct influence on observed behaviors diminishes. Understanding this relationship is central to developing more nuanced models of user interaction with technology.

This statistical phenomenon proves a fundamental human reality within the digital ecosystem. Algorithms, data-driven insights, and omnichannel infrastructures do not autonomously generate trust, commitment, or satisfaction. A platform like Shopee or TikTok Shop can possess the most sophisticated personalization software in the market, but if the consumer evaluates those digital interventions as irrelevant, the technology completely fails to foster any relational bond (bin Abdullah et al. 2025). Consumers must actively interpret the digital stimulus as contextually valuable to bridge the gap between technological capability and psychological loyalty.

Theoretical Implications

This manuscript changes how the Stimulus, Organism, Response model is seen in modern digital commerce research. Earlier studies often claimed a straight line from tech features like personalization to behaviors like trust or buying. This study shows that connection is not that simple. It focuses on how customers see a product as relevant this becomes the key mental step in the process. That belief drives how people react to digital tools. The research adds

a new idea to relational marketing theory: technological capability only shows whats possible, but real connection comes from what customers actually find meaningful.

Managerial Implications

E-commerce executives directing platforms like Lazada, Shopee, and TikTok Shop must urgently recalibrate their digital marketing strategies based on these findings. The data explicitly warn against deploying intrusive, volume-heavy algorithms (Sarwar et al. 2025) Because the direct effect of technology without relevance equals zero, bombarding users with generic push notifications or poorly targeted advertisements actively wastes corporate resources and degrades the user experience.

From a sustainable corporate governance perspective, platforms must pivot from exploitative data extraction toward ethical, value-driven personalization. Managers must design algorithms that respect the consumer's cognitive load, ensuring that every digital interaction provides genuine, immediate utility. To build enduring trust and commitment, digital marketers must prioritize the precision and timing of their communications over sheer volume. Sustainable profitability in the digital era requires Online platforms to treat consumer data not merely as a tool for immediate transaction, but as a sacred asset utilized strictly to enhance the consumer's life context.

Limitations and Future Research Directions

Scholars must acknowledge the structural boundaries of this empirical execution. The researchers strictly utilized a purposive sampling technique to extract data from university students within Selangor, Malaysia. Consequently, the dataset captures a highly localized, digitally native, Generation Z demographic. Future investigators should expand this geographical and demographic boundary, testing the structural model on older cohorts or rural populations who possess distinctly different digital literacy levels and purchasing priorities.

Furthermore, the cross-sectional research design captures only a single behavioral snapshot of the consumer-platform dynamic. Human relationships, particularly those involving trust and commitment, evolve dynamically over time. Future researchers should employ longitudinal methodologies to track how a consumer's perceived relevance and subsequent relationship quality fluctuate over months or years of continuous algorithmic exposure.

Conclusion

This study indicates that technology functions solely as a channel, not a replacement, for authentic human connection within the digital marketplace. Malaysian online platforms are continually advancing technologically. The successful contenders will ultimately be those that grasp the user experience, rather than those relying most heavily on algorithmic approaches. The discerning focus on human needs will distinguish contenders. Digital relationship marketing achieves its goal only when platforms use their unique capabilities to provide clear, context-specific relevance. This approach earns the psychological trust and loyal commitment of today's consumers.

References

Ahmad, J., Zahid, S., Wahid, F. F., & Ali, S. (2021). Impact of role conflict and role ambiguity on job satisfaction the mediating effect of job stress and moderating effect of Islamic work ethics. *European Journal of Business and Management Research*, 6(4), 41-50.

Alam, A., Ali, S., Ahmad, J., Qureshi, A. H., & Ali, I. (2021). The Impact of Informal SME's on Socio-Economic Development of District Mardan. *Indian Journal of Economics and Business*, 20(4).

Alam, A., Ullah, S., & Ahmad, J. (2023). IMPACT OF AUDIT QUALITY ON EARNING MANAGEMENT: A CASE OF CEMENT INDUSTRY. *Sarhad Journal of Management Sciences*, 9(2).

Alqusbi, M. A., Ahmad, J., Sattar, S., Shah, S. Z., Khan, M. A., & Saeed, O. EXAMINING THE RELATIONSHIP BETWEEN TRAINING, EMPLOYEE ATTITUDE AND EMPLOYEE PERFORMANCE WITH THE MODERATING ROLE OF MOTIVATION.

Al-Wugayan, A. (2019). The impact of digital relationship marketing on customer satisfaction and loyalty. *Journal of Business Research, 98*, 11-23.

Ascarza, E., Neslin, S. A., Netzer, O., Anderson, Z., Fader, P. S., Gupta, S., ... & Provost, F. (2018). In pursuit of enhanced customer retention management: Review, key issues, and future directions. *Customer Needs and Solutions, 5*(1), 65-81.

bin Abdullah, S. K., Ahmad, J., Ranom, R., Singh, P. H., & Zahid, S. THE DIGITAL SUSTAINABILITY PARADOX: HOW DIGITAL CORPORATE RESPONSIBILITY TRANSLATES TECHNOLOGICAL CAPABILITIES INTO FIRM VALUE MANAGEMENT.

Creswell, J. W., & Creswell, J. D. (2017). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications.

Darshan, S. The Evolution of Customer Relationships in the Digital Era: A Review on E-CRM.

Department of Statistics Malaysia. (2022). *Demographic statistics, Selangor*. Government of Malaysia.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.

Hayes, A. F., & Rockwood, N. J. (2020). Conditional process analysis: Concepts, computation, and advances in the modeling of the contingencies of mechanisms. *American behavioral scientist, 64*(1), 19-54.

Huang, M. H., & Rust, R. T. (2017). Technology-driven service strategy. *Journal of the Academy of Marketing Science, 45*(6), 906-924.

Kadir, S. A., Harith, A., Kanjanapathy, M., Ahmad, J., & Zahid, S. (2026). Achieving Sustainable Competitive Advantage through Generative AI and Digital Leadership: The Mediating Role of Green Technology Innovation. *Bulletin of Management Review*, 3(1), 133-157.

KIT, W. K. (2024). *DIGITAL ECONOMY: THE INFLUENCE OF GENERATION Z'S EXPERIENCE ON E-COMMERCE PLATFORM* (Doctoral dissertation, UNIVERSITI TUNKU ABDUL RAHMAN).

Lehmann, F. R., Mehta, A. S., & Gutierrez-Lozano, V. (2026). Omnichannel Retail and Revenue Performance: How Integration of Online and In-Store Experiences Drives Sales Growth. *American Impact Review*, *1*(1), e2026020-e2026020.

Lemon, K. N., & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing, 80*(6), 69-96.

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 58*(3), 20-38.

Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology, 88*(5), 879-903.

Rosário, A. T., & Cruz, R. N. (2025). Data-driven decision-making in marketing.

Sarwar, S., Kumar, R., Zahid, S., Ahmad, J., & Abdullah, S. A. K. B. THE IMPACT OF EMPLOYEE TRUST IN LEADERSHIP ON EMPLOYEE WELLBEING WITH THE MEDIATING ROLE OF WORK LIFE BALANCE: THROUGH THE LENSE OF SUSTAINABILITY.

Sher, G., Yousaf, A., Ahmad, J., & Khan, A. A. (2025). EFFECT OF EMPLOYER BRANDING DIMENSIONS CSR, PERCEIVED ORGANIZATIONAL SUPPORT AND TRAINING AND DEVELOPMENT ON EMPLOYEE RETENTION. *Journal of Management Science Research Review*, *4*(4), 562-598.

Trainor, K. J., Andzulis, J. M., Rapp, A., & Agnihotri, R. (2014). Social media technology usage and customer relationship performance: A capabilities-based examination of social CRM. *Journal of Business Research, 67*(6), 1201-1208.

APPENDIX

RESEARCH QUESTIONNAIRE

Screening Questions (To ensure purposive sampling validity):

- Gender of the respondent? (Male / Female)
- Age of the respondent? (16-20 / 21-25 / 26-30)
- Education of the respondent? (Foundation / Bachelor's / Master's)

Instructions to Respondent:

Please select the Online platform you use most frequently (Shopee, Lazada, or TikTok Shop). Keep this specific platform in mind as you read the following statements. Indicate your level of agreement with each statement on a scale of 1 (Strongly Disagree) to 5 (Strongly Agree).

SECTION A: Digital Relationship Marketing Capabilities

This section evaluates how effectively the platform utilizes digital tools to interact with you.

(Personalization Capability)

1. The platform customizes its product recommendations to match my specific personal preferences.
2. The platform adapts its user interface and promotions based directly on my past browsing history.
3. The platform sends me targeted offers that accurately reflect my distinct purchasing habits.

(Interactive Communication Capability)

4. The platform enables immediate, real-time communication when I encounter a question or issue.
5. The platform allows me to actively engage with sellers through direct messaging or interactive live streams.
6. The platform responds dynamically and rapidly to my direct feedback or product reviews.

(Data-Driven Customer Insight Capability)

7. The platform successfully anticipates my future needs before I actively search for a specific product.
8. The platform utilizes my shopping data to proactively suggest complementary products that genuinely interest me.

(Omni-Channel Integration Capability)

9. The platform provides seamless consistent experience when I switch between its mobile application and desktop website.

SECTION B: Customer Perceived Relevance (Mediating Variable)

This section measures your cognitive evaluation of the platform's digital marketing efforts.

1. I consider the promotional notifications I receive from this platform highly relevant to my current needs.
2. The algorithms deployed by this platform understand my immediate purchasing intentions accurately.
3. I find the personalized advertisements on this platform helpful rather than intrusive.
4. The platform times its product suggestions perfectly to match the exact moment I actually need them.
5. I view the data-driven recommendations on this platform as valuable information for my shopping decisions.
6. The interactive features (e.g., live chat, pop-ups) address my specific contextual problems effectively.
7. I feel the platform's attempts to engage me align closely with my personal lifestyle and interests.
8. The platform successfully filters out irrelevant products, saving me time and cognitive effort.
9. I perceive the cross-device reminders (e.g., abandoned cart alerts) as useful prompts rather than digital spam.

SECTION C: One-to-One Customer Relationship Quality (Dependent Variable)

This section assesses the strength of your psychological and relational bond with the platform.

(Trust)

1. I trust this platform to protect my personal data and financial transaction details securely.
2. I believe this platform consistently fulfills its promises regarding product quality and delivery timelines.
3. I have complete confidence in the integrity of the platform's dispute resolution process.
4. I feel entirely safe engaging with the digital marketing tools and links provided by this platform.

(Commitment)

5. I am deeply committed to maintaining my relationship with this platform for future purchases.

6. I actively choose this platform over its competitors even when prices on other platforms are slightly lower.

7. I intend to continue utilizing this platform as my primary digital shopping ecosystem.

8. I frequently defend this platform if my friends or peers criticize it.

(Satisfaction)

9. I feel entirely satisfied with my overall experience within this digital platform.

10. The platform's ability to cater to my individual needs consistently meets or exceeds my expectations.