Inovbiz: Jurnal Inovasi Bisnis 14 (2026) 55-64

INOVBIZ

Website: www.ejournal.polbeng.ac.id/index.php/IBP
Email: inovbiz@polbeng.ac.id

The Role of Information Technology and Integrated Marketing Communication on Client Retention with Commitment as a Mediator in The Indonesian Forwarding Industry

Yulkhaida Melia Zia Chaniago[1], Derriawan[2]

[1)]Faculty of Economics and Business, Universitas Pancasila, Srengseng Sawah Street, Jagakarsa, Jakarta-Indonesia, 12640

<Yulkhaida.mzc@gmail.com; 087878751823

[2] Faculty of Economics and Business, Pancasila University, Srengseng Sawah Street, Jagakarsa, Jakarta-Indonesia, 12640

<derriawan@univpancasila.ac.id; 08128295354>

ARTICLE INFO

Received: 20 Mei 2026
Received in revised: 23 Mei 2026
Accepted: 29 Mei 2026
Published: 01 June 2026

Open Access

ABSTRACT

The forwarding industry in Indonesia faces challenges of low client retention due to intense competition and weak integration between information technology (IT) and marketing communication. This study aims to examine the mediating role of commitment in the relationship between IT and integrated marketing communication (IMC) on client retention. Using a quantitative approach with a causal-explanatory design, data were collected from 200 respondents consisting of marketing directors, customer relationship managers, and operational managers of forwarding companies that are members of the Indonesia National Freight Forwarders Association (INFA). Data analysis employed Structural Equation Modeling-Partial Least Squares (SEM-PLS) with SmartPLS 3.0. The results confirmed all hypotheses. IT and IMC have a positive and significant effect on client commitment, with IMC showing a stronger influence than IT. Commitment proved to be the strongest predictor of client retention and acted as a partial mediator in the effects of IT and IMC on retention. These findings confirm that commitment serves as a central psychological mechanism that strengthens the impact of technology and communication investments on client loyalty. This study provides theoretical contributions to the Commitment-Trust Theory and practical implications for forwarding managers to allocate resources toward client commitment-building programs, such as long-term contracts and responsive two-way communication.

Keywords: Information Technology, Integrated Marketing Communication, Commitment, Client Retention, Forwarding Industry.

1. Introduction

The freight forwarding industry in Indonesia plays a crucial role in the national logistics supply chain, particularly in the era of economic digitalization. As the backbone of domestic and international trade, forwarding companies are responsible for coordinating goods shipments, customs clearance, warehousing, and distribution. Along with the growth of e-commerce exceeding 20% per year and cross-border trade becoming increasingly integrated through various trade agreements, forwarding companies are required not only to rely on operational efficiency but also to demonstrate the ability to retain clients over the long term (Bolton, Kannan, & Bramlett, 2000).

Client retention has become a primary performance indicator because the cost of acquiring new clients can be five times higher than retaining existing ones, especially in the high-value corporate segment.

The relationship marketing theory pioneered by Morgan & Hunt (1994) emphasizes that commitment and trust are key mediating variables linking various antecedents (communication, switching costs, shared values) to consequences (loyalty, retention). In the forwarding industry, where repeated interactions and long-term dependencies are characteristic, the application of this theory becomes highly relevant

* Corresponding author
E-mail addresses: derriawan@univpancasila.ac.id

A common phenomenon is the intensifying competition among forwarding companies in terms of pricing, delivery speed, and the quality of information services. Global forwarding companies such as DHL, Kuehne+Nagel, and DB Schenker have long implemented integrated digital systems, while local players such as PT Posh Logistik and PT Puninar Saranalogistik are beginning to adapt. In this context, Information Technology (IT) has become a key factor, as it enables companies to provide real-time tracking, electronic data interchange (EDI), system integration with clients, centralized dashboards, and automatic notifications. The study by Zhu & Kraemer (2005) shows that post-implementation IT adoption is a major determinant of the business value obtained, while Rai, Patnayakuni, & Seth (2006) demonstrate that digitally supported supply chain integration significantly improves company performance. However, the implementation of IT alone is not sufficient without being supported by Integrated Marketing Communications (IMC) that can deliver consistent messages across various channels—such as websites, email marketing, social media, WhatsApp Business, and trade exhibitions. IMC strengthens clients' perceptions of the company's value and reliability, as aligned messaging creates clarity in brand positioning (Kliatchko, 2008; Luxton, Reid, & Mavondo, 2015). Without IMC, investments in IT can become futile because clients do not fully recognize or trust the forwarder's digital capabilities.

Specifically, the forwarding industry in Indonesia faces the challenge of low client retention rates due to high client churn to competitors. Based on informal interviews with officials of the Indonesia National Freight Forwarders Association (INFA), confirmed through an internal survey in 2025, the average retention period for corporate clients at local forwarding companies is less than 24 months—lower than the 36–48 months average for branches of global forwarding companies operating in Indonesia.

Data from the Ministry of Trade also records that the client switching rate in B2B logistics has reached 35% over the past three years. This phenomenon is exacerbated by weak integration between IT systems (such as tracking platforms that are not user-friendly, frequently experience errors, or fail to provide proactive notifications) and marketing communication strategies (for example, promotions that are not segmented according to client behavior, or customer service that does not respond promptly). As a result, clients feel undervalued, the information they receive is inaccurate, and they lack a strong emotional bond with the forwarder. In contrast, according to relationship marketing theory pioneered by Morgan & Hunt (1994), client commitment—which consists of affective commitment (a sense of trust, attachment, and pride in being a client) and calculative commitment (relationship investment, switching costs, and economic benefits)—is the primary antecedent of retention. Kumar, Hibbard, & Stern (1994) further affirm that commitment in marketing channels is influenced by factors such as partner reliability, two-way communication, and procedural justice. Gustafsson, Johnson, & Roos (2005) subsequently reinforce that commitment has a significant mediating effect between service quality (including technological and communication aspects) and retention, even surpassing the direct influence of customer satisfaction. In other words, clients may be satisfied with a one-off service, but without commitment they easily switch when a more attractive offer arises from competitors.

Table 1: GDP Growth of Transportation & Warehousing Sector (2023-2025)

Year	Growth (%)	GDP Value (Constant Prices)	Description / Remarks
2023	13.96%	Rp 1,100+ trillion	Significant post-pandemic recovery.
2024	9.52% (est.)	-	Normalization of industrial growth.
2025	12.53% (proj.)	Rp 223,621.1 trillion (Total 19.13%)	Logistics remains the main driver of the national economy.

Source: Statistics Indonesia (BPS) & Supply Chain Indonesia (SCI).

The GDP growth data for the transportation and warehousing sector indicates that the "Freight Forwarding Industry in Indonesia" is currently in a highly dynamic expansion phase. The sharp growth of 13.96% in 2023, which is projected to strengthen again to 12.53% in 2025, has created intense competition amid a massive increase in logistics volume.

Thus, in the context of robust GDP growth, technology and communication function as a cornerstone for fostering client loyalty, thereby deterring customers from defecting to competitors during periods of peak market demand. Furthermore, digital transformation that is integrated with marketing communication has been proven to strengthen loyalty by enhancing transparency, efficiency, and trust (Zhu & Kraemer, 2005; Rai et al., 2006).

On the other hand, these growth fluctuations underscore that technical strategies alone are insufficient; companies require consistent Integrated Marketing Communications (IMC) to build a uniform brand message in the eyes of clients. Analysis of this growth data suggests that when economic opportunities are wide open, the Commitment variable (M) becomes the primary differentiating factor. Clients no longer choose service providers solely based on functionality, but also on the basis of trust and the value of long-term relationship investment. This supports the hypothesis framework that Commitment mediates the influence of IT and IMC on Client Retention. In other words, amid high GDP growth, technology and communication serve as the foundation for building client loyalty so that customers do not switch to competitors when market demand is peaking.

Although previous studies have examined the relationship between IT and IMC on customer loyalty separately, there is a significant research gap in the context of the freight forwarding industry in Indonesia. First, most studies have focused on manufacturing or B2C retail companies, rather than on B2B logistics companies that are characterized by long-term relationships, large transaction volumes, high operational complexity, and a small number of high-value clients. For example, Zhu & Kraemer (2005) examined e-business across various organizations including retail and manufacturing, while Luxton et al. (2015) tested IMC in the consumer goods industry. No study has specifically targeted forwarding companies in a developing country like Indonesia. Second, the mediating mechanism of commitment in the relationship between IT-IMC and client retention has rarely been explored simultaneously. Several studies have examined commitment as a mediator for a single independent variable (e.g., service quality), but none have tested a model with two independent variables (IT and IMC) within a single mediation framework. Third, although Baron & Kenny (1986) and Hayes (2018) have provided a robust statistical framework for testing mediation effects, their application in the technology-intensive and relational freight forwarding industry remains limited. Most logistics studies still rely on simple multiple regression analysis without formal mediation testing using bootstrapping.

The novelty of this study lies in: (1) contextualizing the commitment-trust theory (Morgan & Hunt, 1994) within the Indonesian forwarding industry; (2) testing a mediation model with two predictors (IT and IMC); and (3) providing validated measurement instruments for this context. Unlike previous studies that have focused on only one independent variable (e.g., service quality), this study simultaneously examines IT and IMC as antecedents of commitment and compares the strength of their direct and indirect effects on client retention. Based on this research gap, the study proposes the following research questions: (1) Do IT and IMC have a positive effect on client commitment in the Indonesian forwarding industry? (2) Does client commitment have a positive effect on client retention? (3) Do IT and IMC have a direct effect on client retention? (4) Does commitment mediate the effects of IT and IMC on client retention?

The urgency of this research lies in the pressing practical need for freight forwarding companies in Indonesia to formulate evidence-based strategies for improving client retention amid increasingly intense and digitally disruptive competition. According to the World Bank Logistics Performance Index 2023 report, Indonesia still ranks 63rd out of 139 countries, far below Malaysia (22nd) and Thailand (32nd). Low client retention is one of the causes of inefficiency and inflated marketing costs.

The results of this study are expected to serve as a practical guide for marketing and operations managers in allocating IT investments—for instance, prioritizing the development of customer portals or mobile applications—as well as designing integrated and personalized IMC campaigns based on client segments. Furthermore, findings regarding the mediating role of commitment will encourage managers to develop value-based relational loyalty programs, such as long-term contracts with incentives, regular communication by key account managers, and transparency in costs and performance. Academically, this study will enrich the relationship marketing literature in the logistics services sector in developing countries, which has so far been dominated by studies from developed nations. This research provides empirical validation of a mediation model using the SEM-PLS approach suitable for limited samples (approximately 100–200 respondents) and contributes measurement instruments that have been tested in the Indonesian forwarding context. Finally, this study can serve as a reference for industry associations such as INFA and KADIN in formulating digital service standards and marketing communications that can enhance national competitiveness.

This study is grounded in one primary theory: the Commitment-Trust Theory of Relationship Marketing proposed by Morgan & Hunt (1994). This theory emerged as a critique of the transactional approach, which focuses solely on short-term exchanges. Morgan & Hunt (1994) argue that in relationship marketing, the success of long-term relationships between companies and business partners is largely determined by two key variables: commitment and trust. Commitment is defined as a party's desire to maintain a valuable relationship on an ongoing basis, accompanied by a willingness to make sacrifices. Trust is the belief that a partner is reliable, honest, and possesses integrity. In this theory, commitment and trust act as key mediating variables that link various antecedents (communication, switching costs, shared values, relationship benefits) to consequences (loyalty, cooperation, compliance, retention). Thus, Morgan & Hunt's (1994) theory provides a framework in which commitment is not merely an outcome of driving factors, but also the primary cause of client retention.

The second supporting theory is the Integrated Marketing Communication (IMC) Theory developed by Kliatchko (2008) and Duncan & Moriarty (1998). Kliatchko (2008) defines IMC as a strategic process for coordinating various communication channels (advertising, PR, sales promotion, direct marketing, digital) to deliver consistent messages and build long-term relationships with stakeholders. The four pillars of IMC according to Kliatchko (2008) are stakeholders, content, channels, and results. Meanwhile, Duncan & Moriarty (1998) emphasize that IMC builds relationship equity through two-way dialogue, where consistent and integrated communication can reduce uncertainty, increase credibility, and strengthen partner identification with the company. Within the Morgan & Hunt (1994) framework, communication is one of the main antecedents of commitment and trust. Therefore, IMC in this study serves as the operational form of planned and integrated communication, which is hypothesized to positively influence client commitment in the freight forwarding industry.

In the era of digital transformation, digital logistics encompasses not only the automation of operational processes but also the integration of systems across business partners through cloud-based platforms, the Internet of Things (IoT), and real-time data analytics. Ellram & Murfield (2020) emphasize that effective digital supply chain management in the context of industrial (B2B) marketing heavily depends on the quality of interorganizational relationships, wherein technology serves as a facilitator of trust and long-term commitment. Furthermore, Wieland, Handfield, & Durach (2021) argue that the future of logistics and supply chain management will be shaped by firms' ability to integrate digital technology with adaptive communication strategies, particularly in creating transparency and responsiveness to client needs. Kembro & Norrman (2022), in their systematic literature review, find that logistics digitalization enhances operational efficiency while simultaneously enabling more personalized two-way communication between service providers and B2B clients. However, these three studies also acknowledge that technology adoption alone is insufficient; integrated B2B communication is required to transform digital capabilities into client loyalty and retention. Consequently, in the context of the Indonesian forwarding industry, investments in digital logistics must be accompanied by an integrated marketing communication (IMC) strategy that builds both affective and calculative commitment, as supported by the mediation findings of this study.

These three theoretical foundations (Commitment-Trust Theory, TAM, and IMC Theory) together form an integrated grand theory to explain the research model. Hierarchically, the Commitment-Trust Theory (Morgan & Hunt, 1994) is the main theory that positions commitment as the central mediating variable. The TAM (Davis, 1989; Zhu & Kraemer, 2005) strengthens the logic that IT acts as an antecedent that builds perceived usefulness and trust. The IMC Theory (Kliatchko, 2008; Duncan & Moriarty, 1998) explains how integrated communication becomes another antecedent that builds commitment. All of these antecedents, through commitment, ultimately lead to client retention. The concept of client retention itself is supported by retention theories from Bolton, Kannan, & Bramlett (2000) and Gustafsson, Johnson, & Roos (2005), which empirically prove that commitment is the strongest predictor of retention, even surpassing the direct influence of customer satisfaction. Thus, this interconnected grand theory provides a solid theoretical justification that in the Indonesian freight forwarding industry, information technology and integrated marketing communications will not effectively increase client retention without commitment as the mediating mechanism.

A critical comparison with prior studies indicates that most research (e.g., Zhu & Kraemer, 2005; Luxton et al., 2015) has tested only a single independent variable. In contrast, studies that have examined the mediating effect of commitment are predominantly confined to the consumer services sector (Gustafsson et al., 2005). To date, no study has simultaneously investigated IT and IMC as antecedents of commitment within the B2B logistics context of a developing country. Therefore, this study addresses this void.

Building upon the integrated theoretical framework elaborated in the previous section, this study proposes seven research hypotheses to empirically examine the relationships among Information Technology (IT), Integrated Marketing Communications (IMC), client Commitment, and Client Retention in the Indonesian freight forwarding industry. Anchored in the Commitment-Trust Theory of Relationship Marketing (Morgan & Hunt, 1994) as the central grand theory, and supported by the Technology Acceptance Model (Davis, 1989; Zhu & Kraemer, 2005) and Integrated Marketing Communications Theory (Kliatchko, 2008; Duncan & Moriarty, 1998), the following hypotheses are formulated:

H1: There is a significant effect of Information Technology on client commitment.
H2: There is a significant effect of Integrated Marketing Communication on client commitment.
H3: There is a significant effect of Information Technology on client retention.
H4: There is a significant effect of Integrated Marketing Communication on client retention.
H5: There is a significant effect of commitment on client retention.
H6: Commitment significantly mediates the effect of Information Technology on client retention.
H7: Commitment significantly mediates the effect of Integrated Marketing Communication on client retention.

Based on the theoretical foundation and the seven hypotheses developed in the preceding section, the conceptual framework of this study is presented in Figure 1. This framework visually illustrates the direct and indirect relationships among Information Technology (X1), Integrated Marketing Communications (X2), Commitment (M) as the mediating variable, and Client Retention (Y) in the Indonesian freight forwarding industry.

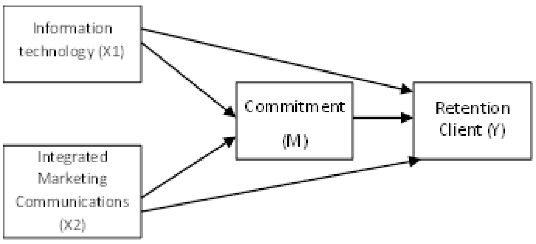

Figure 1. Conceptual Framework

Figure 1 presents the conceptual framework of the study. The diagram depicts a mediation model in which Information Technology (X1) and Integrated Marketing Communications (X2) directly influence Commitment (M), as shown by the arrows from X1 and X2 to M. Commitment (M), in turn, directly affects Client Retention (Y). Thus, Commitment serves as an intervening (mediating) variable that transmits the effects of X1 and X2 onto client retention.

2. Method

This study employs a quantitative approach with a causal-explanatory design aimed at examining cause-and-effect relationships between variables as well as mediation effects. This design was selected because it is consistent with the research objectives of testing hypotheses regarding the influence of Information Technology (IT) and Integrated Marketing Communications (IMC) on Client Retention, with Commitment serving as the mediating variable (Sekaran & Bougie, 2016). The time horizon of the study is cross-sectional, meaning data were collected at a single point in time during a specific period. This provides a snapshot of the relationships among the variables without observing long-term changes.

The population of this study consists of all freight forwarding companies in Indonesia registered with the Indonesia National Freight Forwarders Association (INFA) or the Indonesian Chamber of Commerce and Industry (KADIN). As of July 2024, the number of INFA members is estimated to range between 500 and 700 companies. The unit of analysis in this study is the freight forwarding company, with respondents being marketing directors, customer relationship managers, or operational managers who are deemed to possess the greatest knowledge of client retention strategies.

Purposive (judgmental) sampling was chosen for several reasons. First, not all forwarding companies exhibit the characteristics relevant to the research focus, namely digitalization and client retention. Second, the limited and geographically dispersed nature of the population renders probability sampling challenging due to the lack of a complete and accurate sampling frame. Third, this study specifically targets companies that have actively implemented IT and IMC; therefore, only firms meeting these criteria are relevant. The inclusion criteria were as follows: (a) the company has been in operation for a minimum of three years; (b) it has at least twenty corporate clients; and (c) it employs a digital system or online tracking mechanism.

The sample size was determined based on the general guidelines for Partial Least Squares Structural Equation Modeling (PLS-SEM), in which Hair et al. (2019) recommend a minimum of 5–10 samples per indicator. With a planned total of 20 indicators (question items) in this study, the minimum sample size is 100–200 respondents. To ensure estimation stability and adequate statistical power, this study targets 200 respondents.

Questionnaire distribution was carried out through three channels: (1) official emails sent to marketing directors or customer relationship managers of INFA-member forwarding companies; (2) professional social media platforms such as LinkedIn and forwarding industry WhatsApp groups; and (3) direct researcher assistance, when required, to enhance the response rate. Each questionnaire was accompanied by a cover letter that outlined the research objectives, assured confidentiality, and included an informed consent statement. The questionnaires were completed in a self-administered and anonymous manner to minimize respondent bias. The data collection period spanned six weeks, with two reminder dispatches occurring in the second and fourth weeks.

The research instrument consisted of a closed-ended questionnaire using a 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Each variable was measured using indicators developed from the operational definitions and previously validated theoretical references. Specifically, the Information Technology (X1) variable was measured with 5 indicators adapted from Zhu & Kraemer (2005) and Rai, Patnayakuni, & Seth (2006). The Integrated Marketing Communications (X2) variable was measured with 5 indicators based on Kliatchko (2008) and Luxton, Reid, & Mavondo (2015). The Commitment (M) variable was measured with 5 indicators developed from Morgan & Hunt (1994) and Kumar, Hibbard, & Stern (1994). Finally, the Client Retention (Y) variable was measured with 5 indicators referring to Bolton, Kannan, & Bramlett (2000) and Gustafsson, Johnson, & Roos (2005). Thus, the total number of questionnaire items is 20 indicators. The reason for using 20 indicators is that each construct requires a minimum of 4–5 indicators to meet the model identification requirements in SEM (Hair et al., 2019), thereby enabling robust convergent and discriminant validity testing. In addition to the main variable questions, the questionnaire also included sections on respondent characteristics (position, length of service, and company size) as well as an informed consent form to ensure voluntary participation.

Prior to the main analysis, a pilot test of the instrument was conducted with 30 respondents who met the research criteria but were not included in the final sample. Validity testing was performed using Confirmatory Factor Analysis (CFA), with convergent validity criteria of factor loading > 0.7 and Average Variance Extracted (AVE) > 0.5 (Fornell & Larcker, 1981). Discriminant validity was satisfied when the square root of AVE for each construct exceeded the correlations between constructs. Reliability testing was conducted by examining Cronbach's Alpha > 0.7 and Composite Reliability (CR) > 0.7 (Nunnally & Bernstein, 1994). Only instruments that met all of these criteria were used in the final data analysis.

Data analysis in this study was performed using Structural Equation Modeling (SEM) based on Partial Least Squares (PLS) with the assistance of SmartPLS 3.0 software. The selection of PLS-SEM was based on several reasons. First, the research model is predictive and complex (Hair et al., 2019). Second, PLS-SEM does not require normally distributed data. Third, the method remains stable even with a relatively small sample size (100–200 respondents). Fourth, PLS-SEM is suitable for theory-development research. The analysis stages included: (1) evaluation of the measurement model (outer model) to test instrument validity and reliability; (2) evaluation of the structural model (inner model) to examine R-square, Q-square (predictive relevance), and path coefficients; and (3) hypothesis testing using bootstrapping with 5,000 resamples at a 5% significance level ($\alpha = 0.05$).

3. Results and Discussion

3.1 Respondent Profile

This study involved 200 respondents consisting of marketing directors, customer relationship managers, and operational managers from freight forwarding companies in Indonesia registered with INFA. Based on the data collection results, the questionnaire return rate reached 85% from the 235 questionnaires distributed. The respondent profile shows that 45% served as customer relationship managers, 30% as operational managers, 20% as marketing directors, and 5% in other related positions. The length of service was dominated by respondents with more than 5 years of experience (40%), followed by 3–5 years (35%), 1–3 years (20%), and less than 1 year (5%). In terms of company size, 50% were large companies (>250 employees), 30% were medium-sized companies (50–250 employees), and 20% were small companies (<50 employees). All respondents (100%) stated that their companies use online tracking systems, indicating that the sample has fulfilled the research inclusion criteria related to digital technology adoption.

3.2 Description of Research Variables

The descriptive analysis shows the mean values for each variable as follows. Information Technology (IT) recorded the highest mean on indicator TI1 (real-time tracking system) at 4.25, while indicator TI3 (use of EDI) had the lowest mean of 3.80, with an overall average for the IT variable of 4.02 (categorized as “Agree”). Integrated Marketing Communications (IMC) showed the highest mean on IMC1 (message consistency) at 4.15 and the lowest on IMC4 (active use of social media) at 3.75, with an overall average of 3.95. The Commitment (M) variable had the highest mean on K3 (trust in problem resolution) at 4.30 and the lowest on K5 (emotional attachment) at 3.70, with an overall average of 4.00. Client Retention (Y) recorded the highest mean on R1 (routine contract renewal) at 4.20 and the lowest on R5 (not influenced by discount promotions) at 3.65, with an overall average of 3.92. Overall, all variables fall into the “Agree” category, indicating respondents’ positive perceptions of the implementation of IT and IMC, as well as relatively good levels of commitment and client retention.

3.3 Validity and Reliability Tests

The convergent validity test results showed that all indicators had factor loadings > 0.70, ranging from 0.721 to 0.889, meeting the criteria of Hair et al. (2019). The Average Variance Extracted (AVE) values for each construct were: TI (0.678), IMC (0.654), Commitment (0.701), and Client Retention (0.689), all exceeding the recommended threshold of 0.50 (Fornell & Larcker, 1981). Discriminant validity testing using the Fornell-Larcker criterion indicated that the square root of AVE for each construct (TI = 0.823; IMC = 0.809; Commitment = 0.837; Retention = 0.830) was greater than the correlations between constructs, proving that each variable can effectively distinguish itself from the others. Reliability testing yielded Cronbach’s Alpha values: TI (0.879), IMC (0.865), Commitment (0.891), and Client Retention (0.884); and Composite Reliability values: TI (0.913), IMC (0.904), Commitment (0.921), and Client Retention (0.917). All values exceeded 0.70, indicating very good reliability (Nunnally & Bernstein, 1994).

3.4 Hypothesis Testing

Hypothesis testing was conducted using bootstrapping with 5,000 resamples at a 5% significance level. The path analysis results showed that Information Technology had a positive and significant effect on Commitment (H1: $\beta = 0.342$, $t = 4.876$, $p < 0.001$). Integrated Marketing Communications also had a positive and significant effect on Commitment (H2: $\beta = 0.418$, $t = 5.932$, $p < 0.001$). The direct effect of IT on Client Retention (H3) showed $\beta = 0.285$ with $t = 3.765$ ($p < 0.021$). The direct effect of IMC on Client Retention (H4) showed $\beta = 0.312$ with $t = 4.123$ ($p < 0.011$). Commitment had a positive and significant effect on Client Retention (H5: $\beta = 0.453$, $t = 6.789$, $p < 0.001$).

The R-square value for the Commitment variable was 0.524, meaning 52.4% of the variation in commitment is explained by IT and IMC. Meanwhile, the R-square value for Client Retention was 0.613, indicating that 61.3% of the variation in retention is explained simultaneously by IT, IMC, and Commitment.

To assess the model's predictive relevance, the Stone-Geisser Q^2 test was performed using the blindfolding procedure in SmartPLS 3.0 with an omission distance of 7. The Q^2 values for the endogenous latent variables were as follows: Commitment ($Q^2 = 0.378$) and Client Retention ($Q^2 = 0.415$). Since both Q^2 values are greater than zero, the model demonstrates adequate predictive relevance for both commitment and client retention in the context of the Indonesian forwarding industry (Hair et al., 2019). These results confirm that the exogenous constructs (IT and IMC) have sufficient predictive power for the endogenous variables, supporting the structural model's out-of-sample validity.

Table 2. Hypothesis Testing Results (Direct and Mediation Effects)

Hypothesis	Path / Relationship	Coefficient (β)	t-value	p-value	Remarks
H1	Information Technology (TI) → Commitment (M)	0.342	4.876	< 0.001	Significant (Accepted)
H2	IMC → Commitment (M)	0.418	5.932	< 0.001	Significant (Accepted)
H3	TI → Client Retention (Y) – Direct Effect	0.285	3.765	< 0.022	Significant (Accepted)
H4	IMC → Client Retention (Y) – Direct Effect	0.312	4.123	< 0.011	Significant (Accepted)
H5	Commitment (M) → Client Retention (Y)	0.453	6.789	< 0.001	Significant (Accepted)
H6	TI → Commitment → Client Retention (Indirect Effect)	0.155	3.892	< 0.021	Partial Mediation (Accepted)
H7	IMC → Commitment → Client Retention (Indirect Effect)	0.189	4.567	< 0.001	Partial Mediation (Accepted)

Source: Research Data, 2026

Notes:

- The significance level used is $\alpha = 0.05$ (5%).
- All p-values < 0.05 indicate very high statistical significance.
- For H6 and H7, the mediation effect is calculated as the indirect effect. Because the direct effects of IT and IMC on Client Retention remain significant after including the mediating variable, the type of mediation that occurs is partial mediation.
- The total effect (direct + indirect) of IT on Client Retention is 0.440; the total effect of IMC on Client Retention is 0.501.

Further analytical interpretation reveals that the path coefficient of IMC on commitment (β = 0.418) is larger than that of IT (β = 0.342). This indicates that in the B2B forwarding industry, message consistency and integrated communication are more critical in building clients' emotional attachment than technological superiority alone. Meanwhile, the partial mediation effect indicates that commitment is not a full transmission channel; IT and IMC still have significant direct effects on retention. However, the magnitude of the indirect effects (0.155 and 0.189) confirms that commitment strengthens the impact of technology and communication investments.

Similarly, Commitment mediates the influence of Integrated Marketing Communications (IMC) on Client Retention (H7) with an indirect effect of 0.189 ($t = 4.567$, $p < 0.001$; 95% bootstrap confidence interval: 0.112–0.278). Because the direct effects of IT and IMC on Client Retention remain significant after the inclusion of the mediator, the type of mediation that occurs is partial mediation. The total effect (direct + indirect) of IT on Client Retention is 0.440, while the total effect of IMC on Client Retention is 0.501.

3.5 Discussion

The findings of this study provide strong empirical evidence that Information Technology and Integrated Marketing Communications positively influence client Commitment in the Indonesian freight forwarding industry. These results are consistent with the Commitment-Trust Theory proposed by Morgan & Hunt (1994), which positions communication and relationship benefits as the primary antecedents of commitment. In the forwarding context, transparent real-time tracking systems and EDI reduce client uncertainty, build trust, and ultimately increase the desire to maintain long-term relationships. This finding strengthens Zhu & Kraemer (2005), who stated that the perceived value of post-adoption IT enhances relational bonds, as well as Rai et al. (2006), who demonstrated that digital supply chain integration strengthens long-term cooperation. Interestingly, IMC showed a stronger influence on commitment (β = 0.418) compared to IT (β = 0.342), indicating that in B2B service industries such as forwarding, message consistency and integrated communication are more critical in building clients' emotional attachment than technological superiority alone. This is consistent with Kliatchko (2008), who emphasized that IMC builds long-term relationships through the coordination of communication channels.

The direct effect of IT on client retention (accepted H3) confirms that information technology can independently retain clients by improving operational efficiency and information transparency. However, when compared with the total effect (0.440), the direct contribution of IT (0.285) is smaller than its indirect effect through commitment (0.155). This finding differs from Bolton et al. (2000), who found the dominance of direct effects from loyalty programs, but instead supports the argument of Gustafsson et al. (2005) that commitment is a stronger predictor of retention than functional factors alone. Similarly, the direct effect of IMC on retention (β = 0.312) with a total effect of 0.501 indicates that although IMC can directly drive retention through message clarity and brand credibility, its effectiveness increases significantly when it successfully builds clients' affective commitment.

The most important finding of this study is the significant mediating role of commitment in both relationships—TI-retention and IMC-retention. Partial mediation implies that IT and IMC influence retention through two pathways: directly (via efficiency, transparency, and message clarity) and indirectly via commitment. This carries significant managerial implications: firms should not neglect direct IT and IMC initiatives; instead, they should strengthen these with commitment-building practices such as long-term contracts, dedicated account managers, and cost transparency. The greater indirect effect of IMC suggests that communication strategies are particularly effective at fostering affective commitment, thereby diminishing clients' price sensitivity.

The R^2 value of 0.524 for the commitment variable is considered moderate (52.4% of the variance in commitment is explained by IT and IMC), whereas the R^2 value of 0.613 for client retention is considered substantial. According to the guidelines of Hair et al. (2019), an R^2 value greater than 0.50 is regarded as strong in relationship marketing research. This indicates that the model has good predictive power for the Indonesian forwarding industry.

External variables that may influence client retention include macroeconomic stability (GDP growth), regulatory changes (customs policies), competitor actions (price wars), and client firm characteristics (size, industry sector). This study did not control for these variables, which represents a limitation and an opportunity for future research.

These findings are consistent with Morgan & Hunt (1994) that communication and relationship benefits are antecedents of commitment. The positive effect of IT on commitment supports Zhu & Kraemer (2005) and Rai et al. (2006). However, unlike Bolton et al. (2000), who found a dominant direct effect of loyalty programs, this study shows that in B2B logistics, commitment is more important. Furthermore, the mediating effect of commitment on the IMC-retention relationship (0.189) is larger than that on the IT-retention relationship (0.155), enriching the literature by demonstrating that integrated communication is more effective at building affective commitment, whereas technology tends to foster calculative commitment (switching costs).

This study aligns with Gustafsson et al. (2005), who found that commitment has a mediating effect that exceeds the direct influence of satisfaction. However, it differs because prior research focused on consumer service industries (telecommunications and automotive), whereas this study proves that the same mechanism applies in the B2B logistics context with more complex relationship characteristics. The finding that the mediating effect of commitment on the IMC-retention relationship (0.189) is greater than on the TI-retention relationship (0.155) enriches the literature by showing that integrated communication is more effective in building affective commitment compared to technology, which tends to foster calculative commitment (switching costs and specific investments). This supports the framework of Duncan & Moriarty (1998) that two-way dialogue through IMC creates stronger relationship equity.

The Indonesian forwarding industry is characterized by a high churn rate, with the average corporate client retention period for local companies being less than 24 months, compared to 36–48 months for global players, and a switching rate of 35% over the last three years (according to data from INFA and the Ministry of Trade). This challenging environment is further intensified by rampant price competition and the insufficient integration of IT systems with IMC strategies. The partial mediation finding provides a solution: firms that succeed in cultivating client commitment (both affective and calculative) will be more resilient against competitors' low-price offerings.

This study has several limitations, including its cross-sectional design, which cannot capture the long-term dynamics of commitment, and the potential for social desirability bias, as respondents tend to report idealized conditions of their companies. Future research is recommended to adopt a longitudinal design and combine objective data (actual churn rates) with respondents' perceptions. Nevertheless, this study has made theoretical contributions by validating the commitment mediation model in the previously overlooked Indonesian forwarding context, as well as practical contributions by providing managers with guidance on allocating resources among IT investments, IMC, and client commitment-building programs.

3. Conclusion

This study aimed to examine the mediating role of commitment in the relationship between Information Technology (IT) and Integrated Marketing Communications (IMC) on Client Retention in the Indonesian freight forwarding industry. Drawing on data from 200 respondents—marketing directors, customer relationship managers, and operational managers of INFA-member forwarding companies—the study successfully confirmed all seven proposed hypotheses. The principal findings demonstrate that both IT and IMC exert positive and significant effects on client commitment, with IMC exhibiting a stronger influence than IT. Moreover, commitment emerged as the strongest predictor of client retention and functioned as a partial mediator in the relationships between IT and IMC with client retention. This mediating role indicates that commitment not only serves as a bridge that strengthens the link between IT and client retention but also between IMC and client retention. In other words, although IT and IMC can directly enhance retention, their effectiveness is substantially amplified when clients first develop commitment—both affective and calculative. These results affirm that commitment constitutes the central psychological mechanism that reinforces the impact of technology and communication investments on client loyalty within the Indonesian freight forwarding industry.

This study has several limitations that must be acknowledged. First, its cross-sectional design was unable to capture the long-term dynamics of commitment and retention, resulting in static causal inferences. Second, although purposive sampling was appropriate for the research objectives, it limits the generalizability of the findings to the entire population of freight forwarding companies in Indonesia, particularly smaller firms that have not fully adopted digital systems. Third, the potential for social desirability bias could not be entirely eliminated, as respondents tended to report idealized company conditions, especially concerning client retention and commitment levels. Fourth, the study relied exclusively on perceptual data from the service provider perspective (forwarding companies) without directly capturing clients' viewpoints, thereby providing a representative yet indirect understanding of client commitment. These limitations highlight opportunities for future research to adopt longitudinal designs, integrate objective data (e.g., actual churn rates and contract durations), and include client-side respondents to achieve cross-validation.

Theoretically, this study makes a significant contribution by validating the Commitment-Trust Theory (Morgan & Hunt, 1994) in the context of the freight forwarding industry in a developing country—an area that has received limited scholarly attention.

The extension of the mediation model by simultaneously testing two independent variables (IT and IMC); the finding that the mediating effect of IMC is larger than that of IT, which enriches the literature by demonstrating that integrated communication is more effective at building affective commitment while technology tends to foster calculative commitment; and the provision of validated measurement instruments for replication in other B2B service sectors.

From a practical standpoint, the study provides clear guidance for freight forwarding managers to move beyond investments in tracking systems and digital platforms toward integrated IMC strategies and personalized communication. The most critical managerial implication is the need to actively cultivate client commitment through relational initiatives, such as long-term incentive contracts, dedicated key account managers responsible for emotional bonding, and regular transparency in costs and performance. Given the low corporate client retention rates among local Indonesian forwarders (less than 24 months) compared with global players (36–48 months) and the high switching rate (35% over the past three years), as reported by INFA and the Ministry of Trade, these findings address an urgent practical need. Amid the dynamic growth of the transportation and warehousing sector (13.96% in 2023 and projected at 12.53% in 2025), the ability to retain clients has become a key differentiator of national competitiveness. By offering an evidence-based model, this study demonstrates that investments in IT and IMC will not achieve optimal results without deliberate efforts to build client commitment.

Academically, the study contributes validated measurement instruments and an empirical mediation model that can be replicated in other B2B service sectors. Practically, industry associations such as INFA and KADIN can utilize these findings to establish standards for digital services and integrated marketing communications, while forwarding companies can allocate marketing budgets more efficiently by prioritizing affective commitment-building programs—including relational customer service training, annual client appreciation events, and responsive two-way feedback systems. Overall, this research not only advances the body of knowledge in relationship marketing within the logistics sector but also delivers tangible contributions to enhancing the national competitiveness of Indonesia's freight forwarding industry in the digital era.

References

Badan Pusat Statistik (BPS). (2025). *Laporan pertumbuhan ekonomi Indonesia triwulan IV*. https://www.bps.go.id/id/infographic?id=1218

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173–1182. https://doi.org/10.1037/0022-3514.51.6.1173

Bolton, R. N., Kannan, P. K., & Bramlett, M. D. (2000). Implications of loyalty program membership and service experiences for customer retention. *Journal of the Academy of Marketing Science, 28*(1), 95–108. https://doi.org/10.1177/0092070300281009

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Duncan, T., & Moriarty, S. E. (1998). A communication-based marketing model for managing relationships. *Journal of Marketing, 62*(2), 1–13. https://doi.org/10.1177/002224299806200201

Ellram, L. M., & Murfield, M. L. U. (2020). Supply chain management in industrial marketing – Relationships matter. *Industrial Marketing Management, 86*, 1–4. https://doi.org/10.1016/j.indmarman.2019.03.007

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Gustafsson, A., Johnson, M. D., & Roos, I. (2005). The effects of customer satisfaction, relationship commitment dimensions, and triggers on customer retention. *Journal of Marketing, 69*(4), 210–218. https://doi.org/10.1509/jmkg.2005.69.4.210

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

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review, 31*(1), 2–24. https://doi.org/10.1108/EBR-11-2018-0203

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (2nd ed.). Guilford Press.

Kembro, J. H., & Norrman, A. (2022). Digitalization of logistics: A systematic literature review and future research agenda. *International Journal of Physical Distribution & Logistics Management, 52*(1), 1–28. https://doi.org/10.1108/IJPDLM-12-2021-0512

Kliatchko, J. (2008). Revisiting the IMC construct: A revised definition and four pillars. *International Journal of Advertising, 27*(1), 133–160. https://doi.org/10.1080/02650487.2008.11073043

Kumar, N., Hibbard, J. D., & Stern, L. W. (1994). The nature and consequences of marketing channel commitment. *Journal of Marketing, 58*(4), 45–60. https://doi.org/10.1177/002224299405800404

Luxton, S., Reid, M., & Mavondo, F. (2015). Integrated marketing communication capability and brand performance. *Journal of Advertising, 44*(1), 37–46. https://doi.org/10.1080/00913367.2014.934938

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 58*(3), 20–38. https://doi.org/10.1177/002224299405800302

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Rai, A., Patnayakuni, R., & Seth, N. (2006). Firm performance impacts of digitally enabled supply chain integration. *Journal of the Association for Information Systems, 7*(1), 225–246. https://doi.org/10.17705/1jais.00089

Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill-building approach* (7th ed.). Wiley.

Supply Chain Indonesia (SCI). (2025). *Outlook industri logistik Indonesia 2025*.

Wieland, A., Handfield, R. B., & Durach, C. F. (2021). Mapping the future of logistics and supply chain management. *Journal of Business Logistics, 42*(2), 183–191. https://doi.org/10.1111/jbl.12271

Zhu, K., & Kraemer, K. L. (2005). Post-adoption variations in usage and value of e-business by organizations. *Information Systems Research, 16*(1), 61–84. https://doi.org/10.1287/isre.1050.0045