[USCM] Submission ID 3551

From DSL <dsl@growingscience.com>
Sender DSL <dsl@growingscience.com>
To <miah.said@universitasbosowa.ac.id >, <info@growingscience.com>
Reply-To <dsl@growingscience.com>

Date 2024-06-12 16:55

Thank you for your submission to DSL. Below is a copy of the information submitted for your records.

Submission ID: 3551

Title: Exploring Factors Influencing Consumers' Utilization of Freight Forwarding Services in Indonesia: A Study on Outcome Expectations, Perceived Self-Efficacy, and Moderating Roles of Delivery Risk and Trust Disposition

Author 1:
    First Name: Miah
    Last Name: Said
    Organization: Universitas Bosowa Makassar
    Country: Indonesia
    Email: miah.said@universitasbosowa.ac.id

Author 2:
    First Name: Lukman
    Last Name: Setiawan
    Organization: Universitas Bosowa Makassar
    Country: Indonesia

Author 3:
    First Name: Darmono
    Last Name: Darmono
    Organization: Universitas Muhammadiyah Berau
    Country: Indonesia

Author 4:
    First Name: Andi Yusran
    Last Name: Paris
    Organization: STIE Makassar Maju
    Country: Indonesia

Author 5:
    First Name: Sultan
    Last Name: Sultan
    Organization: STIE Makassar Maju
    Country: Indonesia

Author 6:
    First Name: Mochammad
    Last Name: Fahlevi
    Organization: Bina nusantara university
    Country: Indonesia

Contact Author: Author 1

Topic(s):
    - Uncertainty in SCM applications
    - Just-in-Time
    - Total Quality Management
    - Customer Relationship Management

Keywords: Desire; Intention to Use; Delivery Risk; Trust Disposition; and Cargo

Abstract: The aim of this research is to identify the factors that impact consumers' perceptions and desires to utilize freight forwarding services in Indonesia by examining the effects of outcome expectations, perceived self-efficacy, desire, intention to use, and customer attitude. Additionally, this study also investigates the moderating role of Delivery Risk and Trust Disposition in the relationship between these factors and willingness to use the service. This study utilized a quantitative approach with a purposive sampling technique, which yielded a sample of 181 cargo forwarding service recipients. The study used structural equation modeling (SEM) with the SmartPLS 4 approach to determine the relationships between the variables. The study's findings indicate that Outcome Expectancy has a significant impact on Customer Attitude, Desire, and Intention to Use air cargo transport services. Additionally, Perceived Self-efficacy has a strong tendency to combine Desire and Intention to Use, as well as the perception of the service in question. However, the analysis shows that Customer Attitude has no significant impact on
Intention to Use the Service. The influence of delivery risk and trust disposition moderators is also insignificant in the relationship between other factors and user experience. This study provides more insight into the factors that influence users' decisions to use Indonesia's air cargo transport services, as well as the moderation of delivery risk and the need for trust in the relevant context.

Comments:

Re: [DSL] Submission ID 3551

From Babak Farhang <editor.dsl@gmail.com>
To <miah.said@universitasbosowa.ac.id>
Date 2024-07-10 23:33

Dear Author

This paper uses many words in Indonesian language, specially in tables and figures. Please upload a clean version

Comment:

#Reviewer 1:

Provide a critical analysis of the selected theories and explore their contextual relevance to Indonesia

The proposed hypotheses are repetitive and lack originality, particularly H1 and H2, which overlap conceptually

Standardize citation formats (e.g., APA) and ensure all in-text citations are traceable in the reference list.

The reference list includes inconsistencies in formatting and lacks URLs for online sources cited

#Reviewer 2:

The abstract lacks clarity on the methodology and fails to succinctly articulate the main findings, It overemphasizes generic conclusions, such as the importance of affiliate content, without detailing specific contributions or actionable insights, Specify unique findings, such as which variables were significant or the practical implications especially for cargo industries. Limitations are mentioned briefly, and suggestions for future research are generic. Discuss what the R^2 and Q^2 values mean for the theoretical framework and practical application of the study.

Thanks
Farhang

Re: [DSL] Submission ID 3551

From <miah.said@universitasbosowa.ac.id>
To Babak Farhang <editor.dsl@gmail.com>
Date 2024-07-26 16:11

revision Miah.docx(~361 KB) Freight.pdf(~4.8 MB)

Dear Farhang,

I attach you the result similarity (17%) and revision file, we really hope this paper can be accepted

Reviewer 1

We have expanded the theoretical foundation section to critically evaluate the use of Social Cognitive Theory (SCT) in our study. The revised section now highlights its relevance to Indonesia's unique logistical challenges, such as the geographical dispersion of its archipelago and regulatory constraints. This contextual alignment strengthens the theoretical grounding of our study. Hypotheses H1 and H2 have been revised to ensure they are conceptually distinct. H1 now focuses on the influence of "desire" on "delivery risk," while H2 explores "desire" as it shapes "attitudes." The differences are clarified by emphasizing the unique moderating roles in each hypothesis. All in-text citations and the reference list have been standardized according to APA guidelines. For example:

- In-text citations now use correct formatting (e.g., Bandura, 1986; Koh et al., 2020).
- References include DOIs and URLs where applicable (e.g., [https://doi.org/...]).
- Formatting inconsistencies, such as italicization and capitalization, have been corrected

All entries in the reference list have been cross-verified with the citations in the manuscript. Online sources now include URLs, and missing DOIs have been added.

Reviewer 2

The abstract now clearly states the methodology, including the use of PLS-SEM and the sample of 616 respondents. Specific findings are highlighted, such as "Desire significantly influences both attitudes and delivery risk," and practical implications for the cargo industry are emphasized. The discussion section has been expanded to include specific findings. For example:

- Delivery risk moderates the relationship between desire and attitude.
- Practical implications are outlined, such as the need for risk mitigation strategies and trust-building measures tailored for the cargo industry in Indonesia

Limitations have been detailed further to include The geographical scope (Jakarta, Surabaya, Makassar) and its potential limitations in generalizing findings to remote areas. A call for future research to explore technological innovations and economic factors influencing logistics. Suggestions for future research now include evaluating economic conditions and expanding to rural areas.

A detailed interpretation of R^2 values has been added to the findings section, discussing their implications for the explanatory power of our model. For instance, "R^2 for Actual Usage indicates that 36.9% of the variance is explained by the model." Q^2 values have been elaborated upon to explain predictive relevance and their implications for practical applications, such as improving user attitudes and risk management strategies.

Re: [DSL] Submission ID 3551

From Babak Farhang <editor.dsl@gmail.com>
To<miah.said@universitasbosowa.ac.id>
Date 2024-10-11 10:31

Dear Author

I have received the comments from one of the reviewers and it appears that the paper could be considered for publication should it go under careful editing. We have a group of people who could do this and in case they do the editing your paper will be accepted. The cost of our service is $1300USD. However, it is not obligatory and you may use your own service. If you wish to use our service please let me know, otherwise, feel free to upload a high quality paper using the UPLOAD option.
In case you wish to use our service, please let me know so that I could send you details of the payment.

Sincerely
Farhang

You've sent 1.178,50 $ CAD to Seyed Jafar Sadjadi

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SS **Seyed Jafar Sadjadi** **−$525,89 CAD**
11 October 2024 . Money Sent

DSL

by Miah Said

Submission date: 18-Dec-2024 02:35AM (UTC-0500)
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Exploring Factors Influencing Actual Usage of Freight Forwarding Services in Indonesia: A Study on Desire, Outcome Expectations, Perceived Self-Efficacy and Moderating Roles of Delivery Risk and Perceived Trust

Abstract

This study investigated the factors influencing the actual usage of freight forwarding services in Indonesia, focusing on the roles of desire, outcome expectancy, and perceived self-efficacy, with delivery risk and perceived trust acting as moderating factors. Grounded in Social Cognitive Theory (SCT), this study examines how personal cognitive factors and external risks influence users' attitudes and behaviors toward freight forwarding services. Data were collected from 616 respondents across Jakarta, Surabaya, and Makassar using a structured questionnaire. Hypothetical relationships were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that desire is a significant determinant of attitude and delivery risk, whereas attitude exerts a strong direct influence on actual usage. Outcome expectancy demonstrated weaker effects, specifically on attitudes, while perceived self-efficacy influenced perceived trust. Delivery risk success mediates the relationship between desire for actual usage, and perceived trust success mediates the relationship between perceived self-efficacy and actual usage. Furthermore, delivery risk moderated the relationship between desire and attitude, whereas perceived trust did not moderate the relationship between attitude and actual usage. This study contributes theoretically by incorporating SCT into the logistics sector and generating a potentially broader perspective of adoption in emerging markets..

Keywords: Freight Forwarding Services; Desire; Outcome Expectations; Perceived Self-Efficacy; Actual Usage, Attitude.

1. Introduction

As a component of the global logistics industry, the freight forwarding market plays a crucial role in facilitating efficient trade of goods between countries (Koh et al., 2020; Luttermann et al., 2020). Air, Sea, and Road Freight Forwarders support the complex logistics underlying international trade by mediating the relationship between shippers and various modes of transportation (Verschuur et al., 2022). This service is particularly advantageous for Small and Medium Enterprises (SMEs) as it consolidates client shipments, thereby optimizing cargo space utilization and subsequently reducing shipping costs, thus rendering international trade more accessible and economically viable (Rajesh et al., 2023; Subhashini & Preetha, 2018). Furthermore, freight forwarders provide customized solutions to address specific business requirements and demonstrate adaptability to transportation modes and routes. They assist organizations in selecting optimal air, sea, or road

transport routes by considering factors such as cost, time efficiency, and degree of control. This multimodal approach is not only cost-effective but also enhances supply chain stability by introducing redundancy, thereby mitigating the challenges associated with reliance on a single mode of transport (Zhou & Wan, 2022).

Freight forwarders also enable businesses to gain more control of their supply chain by managing a variety of logistics activities, such as tracking cargo, customs clearance, and inventory management, while ensuring compliance with regulatory standards concerning international trade (Luttermann et al., 2020). Furthermore, in the current era of industry digitalization, freight forwarders have incorporated new technologies to enhance service delivery. The increased utilization of digital platforms, real-time tracking systems, and automated documentation has resulted in a level of transparency that enables businesses to monitor their shipments with unprecedented accuracy, facilitating data-driven decision making throughout the process (Verschuur et al., 2022). This enhanced visibility of the logistics supply chain, coupled with improved operational efficiency, contributes to reduced fuel costs, while simultaneously fostering a more robust relationship between shippers and freight forwarders.

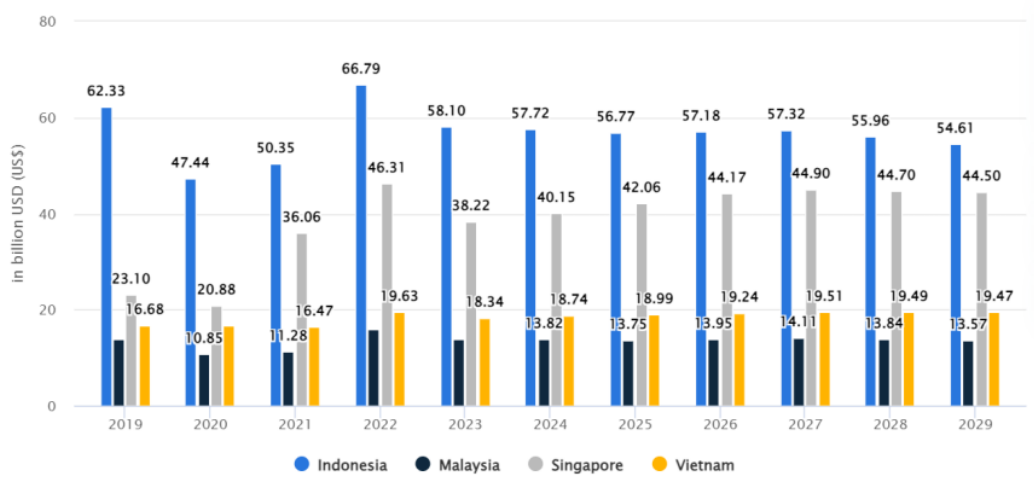

Figure 1. Freight Forwarding Value Added (Indonesia, Malaysia, Singapore, Vietnam), 2019-2029 (in billion USD)

Notes: Data were converted from local currencies using the average exchange rates for each year.

Source: (Statista Market Insights, 2024)

In Southeast Asia, the significance of the logistics and freight forwarding industry is evident in the market sizes of countries, such as Indonesia, Malaysia, Singapore, and Vietnam. Figure 1 depicts the total value of the transportation and logistics markets in these four countries from 2019 to 2029, demonstrating Indonesia's predominant position. By 2022, Indonesia's logistics market is projected to reach 66.79 billion USD, a substantial increase from 62.33 billion USD in 2019 (Statista Market Insights, 2024). This growth is primarily attributed to Indonesia's extensive domestic market, vast geography, and rapid expansion of its e-commerce sector. However, post-2022, the market is anticipated to stabilize, reflecting both saturation and challenges associated with sustaining high growth (Blanquart & Burmeister, 2009; Pinyanitikorn et al., 2024). While Malaysia and Singapore exhibit steady growth in logistics market size, their figures consistently remain smaller than Indonesia's. Despite its status as a major global logistics hub, Singapore possesses a relatively modest market size because of its limited geographical area, focusing more on high-value, efficient logistics rather than large-scale volume (Ganapati & Wong, 2023; Sahu et al., 2022; Wei & Li, 2024). Conversely, Vietnam demonstrates consistent growth, indicative of its emerging role in global supply chains and increasing industrialization (Phung et al., 2023).

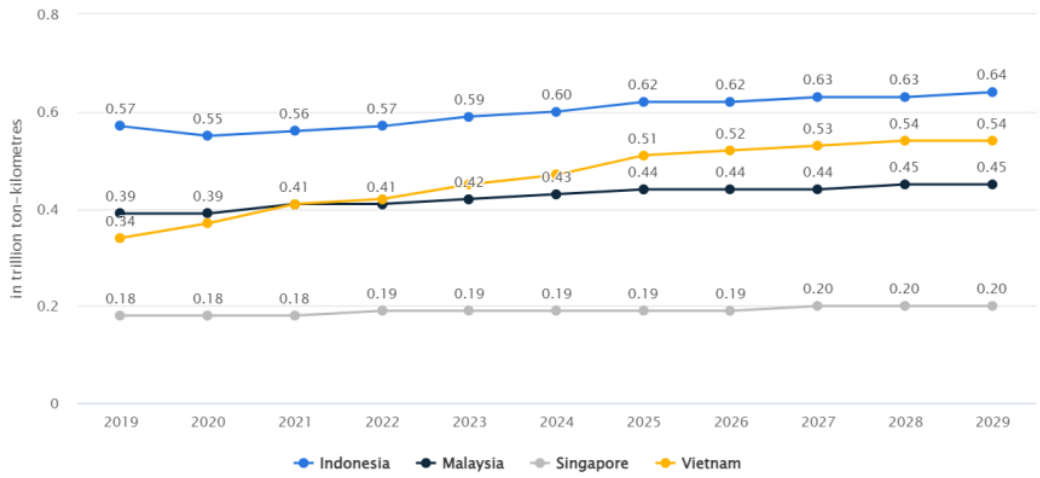

Figure 2. Freight Transported (Indonesia, Malaysia, Singapore, Vietnam), 2019-2029 (in trillion ton-kilometers)

Source: (Statista Market Insights, 2024)

Figure 2 illustrates the freight transport performance in ton-kilometers for these four countries over the same period (Statista Market Insights, 2024). Indonesia maintains the highest total freight volume, projected to

reach 0.64 trillion ton-kilometers by 2029, followed by Vietnam, which exhibits substantial growth attributed to its expanding role in global trade (Phung et al., 2023; Pinyanitikorn et al., 2024). The disparities in freight volumes among these countries underscore a multilevel logistics industry composition, with Vietnam and Indonesia emerging as the most prominent actors in the region propelled by expanding e-commerce and industrial production. Concomitantly, Indonesia's freight forwarding market is undergoing rapid evolution driven by the escalation of e-commerce activities (Sidjabat et al., 2024).

Freight forwarding agents serve as crucial navigators within the complex logistics landscape of the nation, utilizing diverse multimodal transport solutions that integrate waterways, air routes, and road network systems (Blanquart & Burmeister, 2009; Sahu et al., 2022). This adaptability is essential to ensure the optimization of delivery times and minimization of costs, despite the challenges presented by Indonesia's vast archipelagic geography. The integration of digital technology into logistics is most effectively leveraged through the utilization of high-value goods. The development of digital platforms, real-time tracking systems, and automated documentation systems enhances supply chain visibility and improves transparency and efficiency for businesses (Angelelli et al., 2020). In an era of escalating e-commerce demand and heightened customer expectations for expeditious and reliable delivery, digital transformation is imperative for enhancing service quality (Van Asch et al., 2020).

Sustainability is becoming an increasingly significant focus in the freight forwarder market at both global and Indonesian levels. In alignment with broader sustainability objectives, operations are gradually diversifying as logistics providers continue to optimize their routes, not only to conserve fuel but also because of the integration of energy-efficient transportation modes into the industry. These changes are increasingly driven not only by corporate responsibility but also by regulatory pressure to mitigate environmental impacts (Luttermann et al., 2020). This trend indicates that coordination between operational efficiency and environmental sustainability represents a typical solution for most logistics challenges (Huang et al., 2019).

Conversely, the behavioral factors influencing the selection of freight forwarding services were significant. The relationships between desire (Lau et al., 2023; Leyva-Hernández et al., 2021), outcome expectancy (Glock & Krolak-Schwerdt, 2013; Maddux et al., 1986), perceived self-efficacy (Yousaf et al., 2021), and attitude affect the ultimate utilization of these services (Ahmad et al., 2020; McLean et al., 2020). While sustainability may serve as an initial attraction for businesses, it is more convenient (along with cost and/or operational necessity) to drive consumer demand. However, this desire should be accompanied by positive outcome expectancies that the utilization of these services will yield tangible benefits, more punctual deliveries, reduced costs, and enhanced logistics operations. Positive expectations, in conjunction with an individual's or organization's belief in their capacity to manage logistics processes (i.e., perceived self-efficacy), engender a favorable attitude towards the adoption and continued use of freight forwarding services. As logistics adapts to the current

climate, sustainability and user willingness to utilize services are increasingly correlated with higher performance metrics. Perceived self-efficacy is an additional crucial factor that shapes attitudinal changes. When users perceive that they possess sufficient competence to utilize freight forwarding services, whether through digital platforms or through the processing of numerous shipments, this perception can contribute to an elevated expectation of service acceptance. Individuals with a high sense of self-efficacy are likely to exhibit increased confidence in managing logistical processes and interactions with potential service providers. Consequently, if businesses or individuals are confident in their ability to effectively handle these tasks, there is a higher likelihood of motivation and consideration for the utilization of freight forwarding services.

Extant literature on freight forwarding has predominantly focused on the operational domain, encompassing aspects such as service quality, cost reduction, and digitalization through the implementation of novel technologies to enhance logistics operation efficiency (Koh et al., 2020; Zhou & Wan, 2022). To the best of our knowledge, this study represents a novel approach for examining the behavioral factors that influence attitudes and actual usage of such services. This study advances the freight forwarding literature by expanding beyond traditional perspectives that solely focus on logistics efficiency or technological advancements to incorporate psychological and perceptual variables, which are non-traditional factors that have been infrequently examined in previous research. Specifically, this study analyzes factors that enhance users' actual usage of freight services in terms of expected benefits, self-efficacy in logistics matters, and the anticipated reliability performance of service providers in mitigating risks such as delays or damages. These aspects have largely been unexplored in earlier studies, particularly in the context of Indonesia. The significance of this study is further enhanced by the inclusion of delivery risk (Osakwe et al., 2022) and perceived trust (Lavuri et al., 2022; Tian et al., 2023) as moderating variables, thereby providing a comprehensive approach to understanding the barriers and facilitators of service utilization.

1.1. Research Gap

This study demonstrates that the dual focus on both psychological constructs can facilitate understanding of the mechanisms by which positive attitudes toward a service can be counteracted by delivery risks and how perceived trust can mitigate these risks, thereby reinforcing the connection between attitudes and the actual utilization of the service. The relationship between the two psychological factors and the concept of risk is complex, and the discussed perspective may be particularly relevant to the Indonesian market, where logistical challenges and the limited quality of existing infrastructure can heighten perceptions of delivery risk. Previous studies on freight forwarding have extensively focused on service operation, such as quality, cost reduction, and digitalization strategies, including the incorporation of IoT with tracking systems to improve logistics (Koh et al., 2020; Zhou & Wan, 2022). This study adopts a novel approach by examining the behavioral variables that influence the adoption and utilization of these services. This methodology diverges from

conventional frameworks, which typically focus on logistics efficiency and technological advancement. Instead, it considers less frequently analyzed psychological and perceptual factors that contribute to the utilization of such services among clients. This study investigates how users' propensity to invest in freight services stems from their positive service outcome expectations, their self-efficacy in managing logistics, and their transportation companies' collaboration to mitigate service delivery concerns, such as delays and physical damage, which have been insufficiently studied within the context of Indonesian regulations. This study is valuable because it integrates delivery risk (Osakwe et al., 2022) and perceived trust (Lavuri et al., 2022; Tian et al., 2023) as mediating and moderating variables, presenting a comprehensive analysis of the barriers and facilitators of service utilization. Furthermore, the study emphasizes the role of increasing trust in the relationship between attitude and use as a means of mitigating concerns regarding delivery issues. Consequently, this study provides a nuanced examination of the balance between positive perceptions of a service and emerging concerns related to its utilization. This precise interplay of psychological and risk perceptions appears particularly relevant because of logistical challenges and limited infrastructure.

1.2. Novelty

Social Cognitive Theory (SCT) (Bandura, 1986) is a comprehensive theory used to implement the relationships of all variables. This theory facilitates the contextualization of information and provides a comprehensive understanding of how each type of cognition influences the carrier behavior. Furthermore, in the present research, SCT is relevant because it posits a mutual influence between personal cognition and the external environment. Moreover, SCT serves as an appropriate foundation for addressing the questions of the given research as it elucidates how personal cognition can impact carrier behavior. Thus, in the present research, these challenges are addressed by investigating the content of the variables that influence carriers' actual usage of freight forwarding services in Indonesia. Additionally, this study aims to determine whether delivery risk and perceived trust shape such variables. Given that the logistics industry in Indonesia is currently adapting to global trends in digitalization and sustainability, it is crucial to understand these drivers to maintain sustainable market adoption and performance.

2. Theoretical Foundation

First conceptualized by Bandura (1986), SCT is a comprehensive theoretical framework that elucidates how an individual's behavior can be influenced by the interaction between cognitive, environmental, and personal factors. Initially, SCT was developed as a motivational and learning theory for humans; however, it has subsequently been extended to various fields, including health behavior (Fahlevi & Alharbi, 2021), organizational behavior (Ekowati et al., 2023; Shah et al., 2023), and more recently, logistics and service

adoption(Rajesh et al., 2023; Van Asch et al., 2020). Reciprocal determinism is the fundamental concept of SCT, which posits that individual behavior(Carillo, 2010); personal cognitive factors including beliefs, expectations, and self-efficacy; and the environment in which an individual acts are dynamically interrelated so as to have a mutual influence on each other(Abbas et al., 2022). This interaction elucidates why specific behaviors are adopted or abandoned in different settings(Sahir et al., 2021). Consequently, the decision of a company or individual to engage in freight forwarding services results from the interaction between various internal cognitive factors, such as desire, outcome expectancy, and perceived self-efficacy, and external environmental factors, including delivery risk and perceived trust.

Desire signifies an individual's motivation to utilize these services, primarily because of the need for more efficient and cost-effective logistics solutions. These intentions are influenced by outcome expectancies; specifically, the anticipation that employing a freight forwarder will result in benefits, such as advantages in timely deliveries and potential cost reductions. According to SCT, these outcome expectancies play a significant role in an individual's decision-making process as the anticipated outcomes related to their needs and desires are fulfilled through the utilization of these services. Self-efficacy, a fundamental component of SCT, is essential for action (Myers & Horswill, 2006). In this model, perceived self-efficacy refers to an individual's confidence in effectively executing logistics processes, which encompasses interactions with freight forwarders and the management of shipments, including requisite customs documentation and associated complexities. The degree to which individuals perceive themselves as competent problem-solvers or anticipate minimal obstacles correlates positively with their attitudes toward utilizing services. Bandura conceptualizes this phenomenon as self-efficacy, positing that self-confidence is intrinsically linked to an individual's actions across various behaviors, such as skill or task orientation, in specific contexts (Kirsch, 1995).

This is in addition to the private cognitive factors. SCT emphasizes the significance of environmental factors that either facilitate or impede behavior (Fahlevi et al., 2023). The delivery risk and perceived trust function as moderating environmental variables in the freight forwarder model. Conversely, delivery risks, such as delayed or damaged cargo, may reduce users' propensity to utilize freight services, regardless of their desire level and high outcome expectations (Raihan et al., 2024). Alternatively, perceived trust in the freight forwarding provider substantially strengthens the relationship between positive attitudes and use intention (Sutia et al., 2020). Concurrently, if users trust that their chosen provider is reliable and transparent, this results in a reduction in concern about risks, consequently increasing the use of services.

By establishing SCT within this model, the theory functions as a systematic framework for elucidating how the cross-pressure of individual beliefs and environmental constraints influence freight forwarding service adoption. Through the application of SCT, this study demonstrates that the operational efficiency of freight

services is a necessary but insufficient prerequisite for the organizational adoption of such technology. Furthermore, it illustrates that cognitive mechanisms such as desire, expectation, and self-efficacy are integral to fostering positive attitudes towards these services and ultimately translating these favorable attitudes into actual usage, contingent upon perceptions of the risk and trust involved. Consequently, SCT provides a robust theoretical foundation for examining service adoption in the context of logistics providers and facilitates an understanding of how both cognitive and environmental factors can influence user behavior.

3. Methodology

This investigation was conducted in three metropolitan areas of Indonesia: Jakarta, Surabaya, and Makassar, which serve as major logistics hubs with numerous freight forwarding enterprises. The sample size of these metropolitan areas varies according to economic scale and logistics infrastructure, thereby facilitating a comprehensive examination of the determinants influencing freight forwarding utilization in Indonesia.

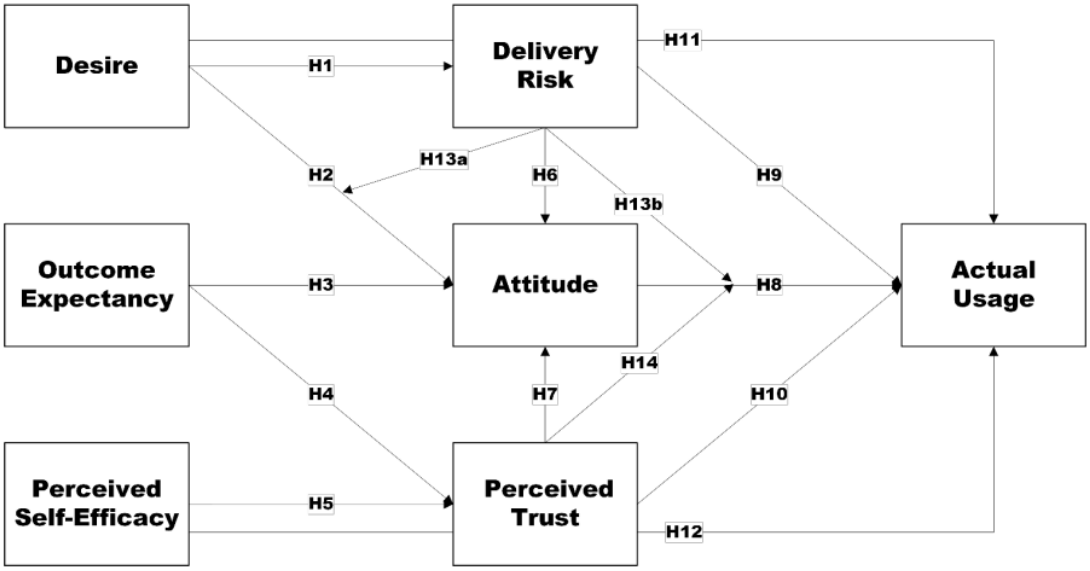

Figure 3. Research Framework

As depicted in Figure 3, the research framework delineates the interrelationships between Desire, Outcome Expectancy, Perceived Self-Efficacy, Delivery Risk, Perceived Trust, Attitude, and Actual Usage of freight forwarding services.

3.1. Sampling Method and Sample Size

To address selection bias and enhance the generalizability of results, random sampling was employed to ensure that each eligible subject had an equal probability of selection (Saunders et al., 2009; Sekaran & Bougie, 2016). For this purpose, a sample size of 616 was obtained, comprising businesses and individuals who are high-frequency users of freight forwarding services in target cities. The sample size was determined using an equation derived from Cochran's formula (Cochran, 1977) for sample size estimation, which is widely used in social science research to determine the minimum number of respondents necessary for reliable statistical inference.

$$n_0 = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:

- n is the required sample size,
- Z is the Z-value (typically 1.96 for a 95% confidence level),
- p is the estimated proportion of the population (we assume 0.5 for maximum variability),
- e is the margin of error (set to 5% or 0.05).

$$n_0 = \frac{3.8416 \cdot 0.25}{0.0025}$$

$$n_0 = \frac{0.9604}{0.0025} = 384.16$$

Using this formula, we determined the necessity for approximately 385 participants. However, owing to the complexity and diversity of the freight forwarding market, we increased the sample size (616) to account for potential missing data and variance between cities. Data were collected using a structured questionnaire (Arsyah & Pakri, 2024; Nurwahyuni et al., 2021), which was distributed to businesses and end-users of freight forwarding services in Jakarta, Surabaya, and Makassar. We aim to include an aggregate of all types of freight customers, ranging from individual shippers to SMEs and large businesses, targeting a wider range of service users in freight forwarding across the three cities. In this study, 683 questionnaires were initially distributed. These were first administered in person, and subsequently via an online platform. Following a comprehensive follow-up process involving reminder emails and telephone calls, 616 fully completed valid responses were received, representing an estimated 90.18% participation rate. This participation rate is considered exceptionally high for a study of this nature, particularly given the geographical and logistical diversity of respondents. This high response rate suggests significant interest in the subject matter and implies its relevance to respondents' business operations. Furthermore, a high response rate helps mitigate concerns regarding non-response bias, thereby enhancing the generalizability of the study's findings.

$$\text{Participation Rate} = \frac{\text{Number of valid responses}}{\text{Total questionnaires distributed}} \times 100$$

$$\text{Participation Rate} = \frac{616}{683} \times 100 \approx 90.18\%$$

Such a level of engagement in the three cities strengthens the validity of the data and confirms the findings; hence, making certain that this study can effectively generalize the behaviors of freight forwarding users in Indonesia.

3.2. Measurement

This study assessed the proposed constructs of desire, outcome expectancy, perceived self-efficacy, delivery risk, attitude, and actual usage perception using a structured questionnaire. The constructs were measured using multiple items derived from existing studies with modifications to ensure applicability to the freight forwarding services domain. Factor loadings (FL) calculated using Confirmatory Factor Analysis (CFA) were employed to evaluate the contribution of each item as an adequate indicator of its construct. In addition, Composite Reliability (CR) and Average Variance Extracted (AVE) were computed to evaluate the reliability and convergent validity of the variables. Following established guidelines, items with factor loadings below 0.7 were considered for elimination, as values below this threshold indicate an insufficient relationship between the item and construct. After eliminating these items, the reliability and validity of the Perceived Self-Efficacy construct improved, as evidenced by the recalculated CR and AVE values for both constructs.

Table 1. Measurement Model Results

Construct	Item Code	Item Statement	FL	CR	AVE
Desire	DS1	I feel motivated to use freight forwarding services frequently.	0.897	0.887	0.814
	DS2	I have a strong interest in using freight forwarding services for my business needs.	0.913		
	DS3	I often seek out freight forwarding services for my logistics requirements.	0.896		
Outcome Expectancy	OE1	I believe using freight forwarding services will improve my business efficiency.	0.924	0.918	0.848
	OE2	I expect that freight forwarding services will enhance my overall logistics management.	0.846		
Perceived Self-Efficacy	PSE2	I am confident in my ability to utilize freight forwarding services effectively.	0.653	0.772	0.684
	PSE3	I feel capable of managing the logistics of freight forwarding services on my own.	0.944		
Delivery Risk	DR1	I worry about potential delays when using freight forwarding services.	0.823	0.750	0.658
	DR2	I am concerned about the reliability of delivery schedules in freight forwarding.	0.796		
	DR3	I consider delivery risk a critical factor when choosing a freight forwarding service provider.	0.814		
Attitude	ATT1	I have a positive attitude toward using freight forwarding services.	0.874	0.834	0.749
	ATT2	I believe freight forwarding services provide good value for my business.	0.868		
	ATT3	I am inclined to recommend freight forwarding services to others in my network.	0.855		

Perceived Trust	PT2	I trust that freight forwarding services will deliver my goods safely and on time.	1.000	1.000	1.000
Actual Usage	AU1	I always using freight forwarding services for my future shipments.	0.870	0.876	0.799
	AU2	I will likely choose freight forwarding services over other logistics options.	0.863		
	AU3	I am satisfied with the performance of freight forwarding services I've used.	0.878		

This refinement of measurement items enabled the model to incorporate only valid and reliable items (Table 1), thereby enhancing the strength of its findings. The variables were assessed using a 7-point Likert-type scale, where 1 = strongly disagree and 7 = strongly agree. A 7-point Likert scale provides greater resolution than a 5-point scale (Likert, 1932). This allowed respondents to indicate their level of agreement or disagreement with more precision, representing nuanced differences in their attitudes and perceptions. This level of granularity is essential in this study, as the latent variables being measured, desire, outcome expectancy, perceived self-efficacy, delivery risk, and perceived trust, may be multifaceted and exhibit varying levels of concordance or confidence. The expanded scale potentially facilitates the better identification of individuals with strong opinions on specific elements of freight forwarding services, as opposed to those with more moderate or neutral perspectives.

3.3. Data Analysis

The collected data were analyzed following the guidelines developed by SmartPLS 4 software (Hair et al., 2017; Ringle et al., 2020), an advanced tool for Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is particularly applicable for this study because it facilitates the examination of complex relationships among latent variables in data distributions that are not normal. This study employs SmartPLS 4 because of its capacity to handle complex models that incorporate moderating variables, such as delivery risk and perceived trust. Furthermore, PLS-SEM is an appropriate modeling platform for the prediction of dependent variables and exploratory research questions, which aligns with this study's investigation of behavioral intentions and actual usage patterns in the previously unexplored context of the Indonesian freight forwarding industry. The non-parametric nature of the tool also enhances its robustness to sample size and distribution (Sarstedt et al., 2017), particularly when examining heterogeneous populations across Jakarta, Surabaya, and Makassar.

4. Finding and Discussion

4.1. Profile Respondent

Table 2 presents the demographic and business characteristics of all the successful respondents in this study (age, gender, business size, years utilizing freight forwarding services, and city). These key elements of the

survey provide a comprehensive overview of the respondent pool and freight forwarders extensively utilized by businesses and individual users in three major urban centers in Indonesia: Jakarta, Surabaya, and Makassar.

Table 2. Characteristics Respondent

Category	Subcategory	Frequency	Percentage
Age	18-30	156	25.3%
	31-45	285	46.3%
	46-60	111	18.0%
	60+	64	10.4%
Gender	Male	366	59.4%
	Female	250	40.6%
Business Size	Small (1-50 employees)	244	39.6%
	Medium (51-250 employees)	223	36.2%
	Large (251+ employees)	149	24.2%
Years Using Freight Forwarding	Less than 1 year	102	16.6%
	1-3 years	180	29.2%
	4-6 years	189	30.7%
	More than 6 years	145	23.5%
City	Jakarta	230	37.3%
	Surabaya	206	33.4%
	Makassar	180	29.2%

Most respondents (46.3%) were within the 31–45 age range, with the next largest segment (25.3%) aged between 18 and 30 years. A smaller proportion (18.0%) falls in the 46-60 age group, while 10.4% of the students were over 60 years old. This distribution suggests a high concentration of freight forwarding service users among young and middle-aged individuals, potentially indicating the significant participation of the youth population in the logistics and e-commerce-related sectors. Regarding gender distribution, male respondents constituted the majority (59.4%), whereas females comprised 40.6% of all respondents. The near-equal gender distribution may be attributed to the traditionally male-dominated nature of the logistics and freight forwarding industry, although the observed female participation is noteworthy. An analysis of the business size data from the question reveals that 39.6% of respondents own small (<50 employees) and 36.2% medium-sized (51–250 employees) businesses. Respondents from businesses with more than 251 employees constituted 24.2% of the total sample. The diverse size distribution of these businesses suggests that freight forwarding services are utilized by both small and large companies.

The duration of experience in freight forwarding is a notable dimension, with 30.7% of the respondents having worked in the field for to 4-6 years, followed by 29.2% with to 1-3 years of experience. A significant proportion (23.5%) of those surveyed had been engaged in the industry for more than six years, representing a substantial segment of experienced practitioners. Concurrently, freight forwarding services appear to be an emerging

market segment, as 16.6% of respondents have been in business for less than a year. Regarding geographical distribution, most respondents resided in Jakarta (37.3%), followed by Surabaya (33.4%) and Makassar (29.2%). This distribution demonstrates the significance of these cities as strategic logistics hubs in Indonesia, with Jakarta being the predominant market for the freight forwarding industry.

4.2. Common Method Bias (CMB)

Table 3 presents the ((CMB) test results using the VIF for the full-size table of the inner model. VIF was utilized to identify the presence of multicollinearity, which is indicative of CMB in the data. When applied to the logistic regression model, multicollinearity in this context refers to a high influence between the independent variables in the model, potentially leading to inflated standard errors and unreliable coefficient estimates.

Table 3. VIF Inner Model

Inner Path	VIF
ATT -> AU	1.227
DR -> ATT	1.618
DR -> AU	1.215
DS -> ATT	1.722
OE -> ATT	1.175
PSE -> ATT	1.259
PT -> ATT	1.360
PT -> AU	1.053

A guideline regarding VIF values suggests that they should not exceed 5, and preferably be below 3.3 to mitigate collinearity concerns. However, all VIF values in this study were well below the threshold of 3 (1.053–1.722). This indicates that there is no significant multicollinearity issue in the model, and that common method bias does not pose a threat to this investigation. Upon examination of the table, it is evident that the VIF value is highest for the path of DS (desire) -> ATT (attitude), which is 1.722, still within the acceptable limit. This suggests that, while a certain degree of influence exists between desire and attitude, the magnitude is likely not sufficient to result in multicollinearity problems or common method bias. In the path PT (Perceived Trust) → AU (Actual Usage), VIF attained its lowest value of 1.053, indicating a favorable relationship, as these factors share minimal variance across all features.

4.3. Discriminant Validity

The heterotrait–monotrait ratio (HTMT) serves as a crucial indicator for evaluating discriminant validity in SEM, as shown in Table 4. Discriminant validity refers to the degree to which distinct constructs are conceptually dissimilar. To establish discriminant validity using HTMT, the ratio of indicators across factors

should generally be below 0.85, with a more stringent threshold of approximately 0.90, which is preferable in certain circumstances.

Table 4. HTMT

	ATT	DR	DS	IU	OE	PSE	PT
ATT							
DR	0.416						
DS	0.535	0.711					
IU	0.666	0.444	0.566				
OE	0.125	0.106	0.115	0.079			
PSE	0.087	0.046	0.068	0.089	0.387		
PT	0.170	0.073	0.080	0.095	0.351	0.438	

The HTMT values presented in Table 4 indicate that all construct pairings have values below the recommended benchmark, with none exceeding 0.711, which is significantly lower than the more stringent threshold of 0.90. For instance, the HTMT value for desire (DS) and attitude (ATT) was 0.535, demonstrating a moderate association between these two attributes while maintaining relatively distinct constructs. Similarly, the highest observed HTMT value of 0.711 between Delivery Risk (DR) and desire (DS) further confirms that these constructs are substantially different, thus ensuring that the criterion of discriminant validity is not violated.

Another approach to assess discriminant validity was employed (Fornell-Larcker criterion) (Table 5). Discriminant validity: To fulfill the conditions of simultaneously achieving discriminant validity, discrimination should be satisfied, which can be measured according to the Fornell-Larcker criterion, which stipulates that diagonal values in the table should yield a square root exceeding their influence with every other construct. This criterion ensures that each construct exhibits more shared variance with its own indicators than any other construct.

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Table 5. Fornell Larcker

	ATT	DR	DS	IU	OE	PSE	PT
ATT	**0.866**						
DR	0.324	**0.812**					
DS	0.461	0.591	**0.902**				
IU	0.570	0.357	0.499	**0.894**			
OE	0.105	0.082	0.100	0.068	**0.924**		
PSE	0.064	0.027	0.051	0.065	0.236	**0.832**	
PT	0.155	0.011	0.076	0.089	0.319	0.347	**1.000**

Table 5 indicates that the construct demonstrates a stronger influence with its indicators than other constructs, thereby establishing the validity of the constructs. For example, the value for attitude (ATT) is 0.866, which exceeds its influence with other constructs, such as desire (DS) at 0.461 or Delivery Risk (DR) at 0.324. Similarly, for Outcome Expectancy (OE), the diagonal value (0.924) surpasses its influence with other constructs, such as attitude (ATT) at 0.105 or Perceived Self-Efficacy (PSE) at 0.236.

4.4. Model Fit

Table 6 presents the common measures of model fit and the explained variance used to evaluate the key constituents of the model. The table provides a summary of model fit indices for the saturated and estimated models, as well as R-square and adjusted R-square values for attitude (ATT) and Actual Usage (AU) constructs. These metrics provide insight into the model's goodness of fit to the data and the proportion of variance in the dependent variables accounted for by the independent variables.

Table 6. Model fit and R-square

Model Fit Index	Saturated Model	Estimated Model	R-square	R-square Adjusted
SRMR	0.061	0.067	ATT	0.252
d_ULS	0.568	0.694	AU	0.369
d_G	0.311	0.313	ATT	0.238
Chi-square	1.190.666	1.177.192	AU	0.364

The Standardized Root Mean Square Residual (SRMR), a critical indicator of model fit, demonstrated values of 0.061 for the Saturated Model and 0.067 for the Estimated Model. An SRMR value below 0.08 denotes a good model fit, suggesting that both models exhibit an acceptable level of fit with the data. The d_ULS (Unweighted Least Squares Discrepancy) and d_G (Geodesic Discrepancy) indices further evaluated the goodness of fit, with both models demonstrating comparable values (e.g., d_ULS at 0.568 for the Saturated Model and 0.694 for the Estimated Model). These values also indicated that the models adequately fit the observed data. The Chi-square values for both models are provided, with the Saturated Model exhibiting a value of 1.190.666 and the Estimated Model slightly lower at 1.177.192. Lower chi-square values indicate a better fit; however, given the large sample size, chi-square should be interpreted with caution, as it can be sensitive to sample size. Regarding the explained variance, the R-square values for attitude (ATT) and Actual Usage (AU) are presented. ATT had an R-square of 0.252, indicating that approximately 25.2% of the variance in attitude was explained by the independent variables. AU has a higher R-squared value of 0.369, signifying that approximately 36.9% of the variance in Actual Usage is explained by the predictors. The adjusted R-squared values, which account for the number of predictors in the model, were slightly lower, with 0.238 for ATT and 0.364 for AU.

4.5. Path Analysis

Table 7 presents the Path Coefficients, which provide the statistical results of structural model testing, including the direct and moderating relationships between the constructs in this study. The table comprises the path coefficients (O), mean values (M), standard deviations (STDEV), t-statistics (|O/STDEV|), and p-values for each hypothesis, along with the determination of whether the hypothesis was supported.

Table 7. Path Coefficients

Hypothesis		(O)	(M)	(STDEV)	(|O/STDEV|)	P values	Decision
H1	DS -> DR	0,589	0,592	0,031	19,046	0,000	Supported
H2	DS -> ATT	0,458	0,457	0,036	12,514	0,000	Supported
H3	OE -> ATT	0,016	0,049	0,042	1,136	0,128	Not Supported
H4	OE -> PT	0,247	0,223	0,041	5,735	0,000	Supported
H5	PSE -> PT	0,286	0,258	0,040	6,003	0,000	Supported
H6	DR -> ATT	0.046	0.079	0.047	1.601	0.055	Not Supported
H7	PT -> ATT	0.118	0.115	0.042	2.833	0.002	Supported
H8	ATT -> AU	0.484	0.485	0.041	11.828	0.000	Supported
H9	DR -> AU	0.219	0.218	0.042	5.205	0.000	Supported
H10	PT -> AU	0.018	0.017	0.031	0.561	0.287	Not Supported
H11	DS -> DR -> AU	0,129	0,122	0,024	5,102	0,000	Supported
H12	PSE -> PT -> AU	0,031	0,031	0,016	1,888	0,030	Supported
H13a	DR x DS -> ATT	0.101	0.091	0.036	2.479	0.007	Supported
H13b	DR x ATT -> AU	-0.110	-0.106	0.056	1.900	0.029	Supported
H14	PT x ATT -> AU	0.039	0.042	0.040	1.033	0.151	Not Supported

The analysis of the path coefficients revealed several significant relationships within the model. The primary findings indicate that approximately half of the variation in Delivery Risk (DR) is attributable to desire (DS), with a statistically significant path coefficient of 0.589 (t-statistic = 19.046, p-value = 0.000). This suggests that individuals utilizing freight forwarding services have increased stakes, implying that heightened demand correlates with willingness to assess certain risks (focusing on anticipation of timely and stable provision). Additionally, Attitude (ATT) is substantially influenced by desire, exhibiting a path coefficient of 0.458 and a t-statistic of 12.514 (p-value = 0.000) on the construct. This demonstrates that desire significantly affects users' perceptions of freight forwarding services. Conversely, no significant relationship exists between Outcome Expectancy (OE) and Attitude (ATT). The path coefficient (0.016), t-statistic of 1.136, and p-value of 0.128 indicate that user attitudes are not significantly affected by expectations regarding the positive outcomes of service utilization. However, Outcome Expectancy (OE) demonstrates a significant positive effect on Perceived Trust (PT, with a path coefficient of 0.247 and t-statistic of 5.735, p-value 0.000), suggesting that

when users anticipate favorable outcomes from utilizing freight forwarding services, trust levels may be lower, or vice versa.

The direct influence of Perceived Self-Efficacy (PSE) on Perceived Trust (PT) was significant at a 0.01 level, with a path coefficient of 0.286 and t-value = 6.003 (p-value = 0.000). Consumers who exhibit confidence in their ability to manage freight forwarder services as autonomous individuals have a higher likelihood of relying on service providers. The only relationship that did not exhibit statistical significance was the path from Delivery Risk (DR) to attitude (ATT), where a p-value of 0.055 and an associated t-statistic of 1.601 indicated that perceptions of risk do not appear to directly influence attitudes towards the services offered at such outlets. The path coefficient from Perceived Trust to Attitude (ATT) is 0.118 and statistically significant at the 99 percent level, as evidenced by a t-value of 2.833 (p-value = 0.002). This outcome suggests that trust in the service provider positively influences attitudes towards utilizing freight forwarding services. ATT demonstrated a significantly strong impact on AU of 0.484 (t-statistic = 11.828, $p < 0.05$), indicating that the attitude or disposition toward using bike-sharing serves as a robust predictor of actual usage.

Delivery Risk (DR) demonstrated a significant relationship with Actual Usage (AU), as evidenced by a path coefficient of 0.219, t-value of 5.205, and p-value less than 0.05. This indicates that DR can directly influence the utilization and usage intention of freight forwarding service users during document dispatch. The perception of the risk associated with using freight forwarder services affects usage decisions. Conversely, the relationship between Perceived Trust (PT) and Actual Usage (AU) was not statistically significant, with a path coefficient of 0.018, t-statistic of 0.561, and p-value of 0.287, suggesting that individuals do not base their usage decisions solely on trust.

The indirect effect of desire on actual usage via delivery risk (DS-DR-AU) was statistically significant, with a path coefficient of 0.129, t-statistic of 5.102, and p-value of 0.000, supporting Hypothesis H10, which posits delivery risk as a moderating variable between desire and actual usage. Similarly, perceived self-efficacy had a significant indirect effect on actual usage through perceived trust (indirect effect: 0.031, t = 1.888, p = 0.030), indicating that self-efficacy influences the judgment of trust, which subsequently increases consumers' actual usage. The interaction effect between Delivery Risk (DR) and desire (DS) on attitude (ATT) was found to be statistically significant, with a path coefficient of 0.101, t-statistic of 2.479, and p = 0.0072, suggesting that delivery risk can enhance or diminish the relationship between desire and attitude, depending on the level of perceived risk. A significant interaction effect between Delivery Risk (DR) and attitude (ATT) on Actual Usage (AU) was also observed: DR × ATT → AU exhibited a negative path coefficient of −0.110 with a t-value of 1.900, $p < 0.050$ (p-value = 0.029), indicating that high levels of delivery risk may attenuate the effect of attitude on usage volume attributed to service provider influence. However, the moderating effects of trust between Perceived Trust (PT) and attitude (ATT) on Actual Usage (AU) yielded a relatively insignificant path

coefficient of 0.039 with a t-value of 1.033 and a p-value of 0.151, demonstrating that trust does not moderate the relationship between attitude and actual usage.

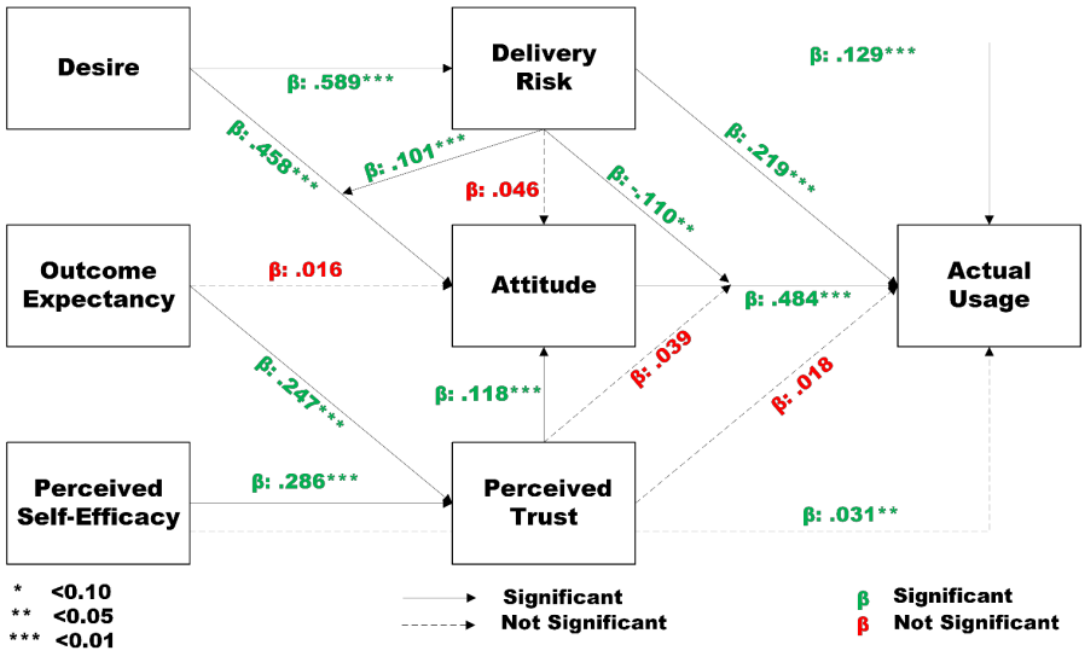

Figure 4. Findings Summary

The path analysis results replicated the associations of factors that caused direct or indirect impacts on Attitude (ATT) and Actual Usage (AU) for freight forwarding services. The strongest link in the model was from desire (DS) to Delivery Risk (DR). This relationship has a path coefficient of 0.589 and a t-statistic of 19.046, indicating that individuals with a higher desire for freight forwarding services will evaluate and perceive delivery risks more readily. This suggests that the increased demand for these services has prompted users to consider the potential implications for timely delivery more thoroughly. The magnitude of this effect emphasizes the central role of desire in shaping risk perceptions. Similarly, the path coefficient of ATT → AU was 0.484, with a significant t-statistic of 11.828. This relationship is consistent with the finding that favorable attitudes toward Freight Forwarding Services represent one of the most important predictors of the adoption of freight forwarding services. This underscores the necessity of fostering positive attitudes towards broader and more consistent freight forwarding usage, as strongly positive attitudes not only tend to predict usage but also do so consistently. Perceived self-efficacy demonstrates the capacity to influence perceived trust (as evidenced by the path from PSE to PT). The weakest relationship observed was the path from Outcome

Expectancy (OE) to attitude (ATT), with a path coefficient of 0.016 and a t-statistic of 1.136. This finding suggests that the outcome expectancy of freight forwarding services has a limited impact on attitudes towards these types of services. These results indicate that while one might postulate that positive outcome expectancies would influence attitudes, other factors such as desire and trust exert a more substantial impact on attitude formation.

4.6. Discussion

This study analyzes how personal factors (desire, outcome expectancy, and perceived self-efficacy) interact with environmental factors (delivery risk and perceived trust) to influence user attitudes and determine actual usage. These results are consistent with SCT, which emphasizes the interplay between individual cognition and external cues underpinning behavior (Bandura, 1986). In this model, desire was identified as a key element with a significant impact on both attitude and delivery risk. This finding aligns with the theoretical proposition that in such an intensive-freight service intention, individuals evaluate freight forwarding services consciously and have favorable perceptions, thus serving as a motivator in the attitude-behavior dichotomy of innovation adoption (Rajesh et al., 2023). In Indonesia, the operational needs for delivery are increasing rapidly owing to e-commerce growth and fulfillment across large geographical distances within the country itself (Luttermann et al., 2020). These results indicate that Indonesian consumers and businesses exhibit price and payment sensitivity to the performance of logistics services as they rely more heavily on third-party quick service delivery than on their automated internal delivery processes.

A significant influence was observed between attitude and actual usage, which underscores the necessity of fostering positive attitudes to increase the future utilization of freight forwarding services. This aligns with prior research suggesting that service fit is based on attitudes, particularly for services that have a direct impact on overall business success (Verschuur et al., 2022). For Indonesian logistics providers, this implies that effective marketing strategies should emphasize service reliability and customer satisfaction to enhance user attitudes as the market expands in size and significance. Notably, the results indicate that the direct effect of outcome expectancy and perceived self-efficacy on attitude is not significant or less significant compared with other studies that have emphasized how expected outcomes drive attitudes (e.g., Subhashini & Preetha, 2018). Within the Indonesian context, characterized by infrastructure limitations and regulatory complexities, these insights may suggest that users focus less on potential outcomes and more on immediate risks and challenges in their logistics endeavors. Indeed, the expected long-term benefits of delivery systems could potentially be mitigated, if not offset, by the unpredictability of these factors encountered in the Indonesian freight forwarding market, further highlighting their unique characteristics.

This indicates a significant effect of perceived trust on attitude formation, thus further emphasizing the importance of trust building in logistics services. In Indonesia, freight forwarding services face substantial

challenges regarding reliability (including the safety of shipments and timeliness) and customs clearance for international shipment (Huang et al., 2019). Consequently, most users must be confident in the service providers who navigate these obstacles. The study's findings align with the previous assumption that logistics providers in Indonesia should prioritize transparency, consistent communication, and service reliability to establish trust and foster positive attitudes toward actual usage. Delivery risk and perceived trust function as moderating variables in the dynamics of freight forwarding service adoption. The substantial moderating effect of delivery risk, particularly on the relationship between desire and attitude, suggests that exceptionally high delivery risks can potentially mitigate the strongest motivations for service utilization. These risks are especially pertinent to Indonesia given its logistical infrastructure and geographic dispersion (Luttermann et al., 2020). Consequently, desire will translate into positive attitudes and use; if carriers aim to increase demand for services, they must mitigate the risks in these operations through demonstrable levels of service delivery and supply chain transparency.

This study offers a novel perspective by specifically examining the behavioral aspects influencing the adoption of freight forwarding services, rather than primarily focusing on operational effectiveness or technological integration (Koh et al. 2020; Zhou and Wan 2022). This study provides insights into user-side motivations for logistics service adoption in Indonesia in a geographically and culturally distinct context. It explores how desired services reinforce customer lifetime value (CLV) or potentially violate attribute theory mandates as well as self-efficacy among the population, with respect to desire-driven consumer demand and outcome expectancy. Furthermore, considering delivery risk and perceived trust as moderators enhances our understanding of both barriers (i.e., factors that hinder uptake) and facilitators (factors that promote uptake) for service usage, an area that has been relatively underexplored in existing research. The application of Social Cognitive Theory (SCT) to this study demonstrates how individual cognitive factors, including motivation and self-efficacy, interact with environmental factors such as delivery risk to influence behavior. The SCT framework elucidates the complex interrelationships between multiple complicating factors in the Indonesian logistics sector, where external environments or risk perceptions frequently constrain individual preferences and capacities. The proposed theoretical application holds particular relevance in Indonesia, where a geographically and legally diverse nation, comprising over 17,000 islands, presents challenges in delivering to and from various locations. Consequently, trust is crucial for service adoption as it mitigates delivery risks.

5. Conclusions

The results of this research highlight the importance of understanding personal motivations and external risks affecting freight forwarding services in Indonesia. This research offers significant implications for logistics managers and indicates that cultivating positive attitudes and mitigating delivery risks are essential in the context in which trust plays a leading role in stimulating service usage in this fast-growing market. The

originality of the study is that it significantly contributes to integration behavior in studying freight forwarding services, which has always been interesting to explore new perspectives that can be applied to service provision, either within Indonesia or globally. Although this research has interesting findings, there are some limitations that should be addressed. This study is limited in geographic scope to three key Indonesian cities: Jakarta, Surabaya, and Makassar. Although these cities constitute major logistical hubs, they may not fully capture the gamut of logistical challenges and user behaviors across the vast Indonesian archipelago (especially in more remote or less-developed areas). In the future, the scope of work may be extended in time and space to cover different cities or rural regions to obtain a better idea of the freight forwarding market in the country. The model provides insight into cognitive and perceptual variables as conceptualized by SCT, without giving much thought to other possibly influential factors such as economic situation, competitive pressures, or technological innovations in the freight forwarding sector. These are triggers, including negative ones, that will have a major impact on the way health service providers and patients experience and do things. Future research could provide a more comprehensive account of the factors that affect freight forwarding service adoption in Indonesia if these variables are included.

The implications for logistics service providers are correspondingly significant: the necessity to establish trust and mitigate delivery risks is crucial to engender favorable attitudes towards a service and drive purchase intent. Regarding common concerns, such as delivery delays or the risks associated with ordering from a provider delivering locally or internationally, these service failures are best addressed by providers enhancing their service reliability, implementing a transparent tracking system, and offering adequate levels of customer support. Therefore, providers should establish clear expectations with customers and proactively manage their requirements, recognizing that these directly correlate with delivery risk, particularly for high-value shipments where delays or damage are more materially consequential. From a policy perspective, this study underscores the need for infrastructure investments and regulatory changes that reduce delivery risk, which is a substantial impediment to adoption. Indonesian policymakers may consider investing in logistics infrastructure, particularly in the less-developed regions of Indonesia, to ensure that freight forwarding services can operate more competitively throughout the archipelago. Furthermore, a robust regulatory framework will also facilitate trust building between service providers and users, consequently enhancing overall logistics market competitiveness in Indonesia.

Data Availability Statement

The data supporting the findings of this research are available at https://bit.ly/4eDGgfB

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Exploring factors influencing actual usage of freight forwarding services in Indonesia: A study on desire, outcome expectations, perceived self-efficacy and moderating roles of delivery risk and perceived trust

Miah Said[a*], Lukman Setiawan[b], Darmono[b], Andi Yusran Paris[c], Sultan[c] and Mochammad Fahlevi[d,e]

[a]*Universitas Bosowa Makassar, Makassar, Indonesia*
[b]*Universitas Muhammadiyah Berau, Indonesia*
[c]*STIE Makassar Maju, Makassar, Indonesia*
[d]*Management Department, BINUS Online, Bina Nusantara University, Jakarta 11480, Indonesia*
[e]*Operation Research & Management Sciences, Faculty of Business and Management, Universiti Sultan Zainal Abidin (UniSZA), Malaysia*

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This study investigates the factors influencing the actual usage of freight forwarding services in Indonesia, focusing on the roles of desire, outcome expectancy, and perceived self-efficacy, with delivery risk and perceived trust acting as moderating factors. Grounded in Social Cognitive Theory (SCT), this study examines how personal cognitive factors and external risks influence users' attitudes and behaviors toward freight forwarding services. Data were collected from 616 respondents across Jakarta, Surabaya, and Makassar utilizing a structured questionnaire. Partial Least Squares Structural Equation Modeling (PLS-SEM) was employed to test the hypothesized relationships. The findings reveal that desire significantly influences both attitude and delivery risk, while attitude has a strong direct effect on actual usage. Outcome expectancy and perceived self-efficacy demonstrated weaker effects, particularly on attitudes, suggesting that other factors, such as trust and risk perceptions, play a more significant role in this context. Additionally, delivery risk was found to moderate the relationship between desire and attitude, while perceived trust did not moderate the link between attitude and actual usage. The research underscores the importance of trust-building and risk mitigation strategies for freight forwarding service providers in Indonesia. The study also provides theoretical contributions by applying SCT to the logistics sector and offers practical implications for enhancing service adoption in emerging markets.

1. Introduction

The freight forwarding market constitutes a critical component of the global logistics industry, facilitating the efficient movement of goods across international borders (Koh et al., 2020; Luttermann et al., 2020). By functioning as intermediaries between shippers and various transportation services air, sea, and road freight forwarders enable the complex logistics processes that underpin global trade (Verschuur et al., 2022). Their services are particularly advantageous for small and medium-sized enterprises (SMEs), as they consolidate shipments from multiple clients to optimize cargo space and reduce shipping costs, thereby rendering international trade more accessible and cost-effective (Rajesh et al., 2023; Subhashini & Preetha, 2018). Moreover, freight forwarders provide customized logistics solutions that align with the specific requirements of businesses, offering flexibility in transportation modes and routes. They assist companies in selecting the optimal combination of air, sea, and road transport based on factors such as cost, delivery time, and geographical constraints. This multimodal approach not only ensures cost efficiency but also enhances supply chain reliability by mitigating the risk of delays associated with reliance on a single mode of transport (Zhou & Wan, 2022).

* Corresponding author
E-mail address miah.said@universitasbosowa.ac.id (M. Said)

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In addition to cost reduction, freight forwarders provide businesses with enhanced control over their supply chains, as they manage various logistical tasks such as cargo tracking, customs clearance, and inventory management, while ensuring compliance with international trade regulations (Luttermann et al., 2020). Furthermore, in an era of increasing digitalization, freight forwarders have incorporated new technologies to enhance their service offerings. The implementation of digital platforms, real-time tracking systems, and automated documentation processes has improved transparency, enabling businesses to monitor shipments more effectively and make informed decisions based on real-time data (Verschuur et al., 2022). This technological advancement not only improves operational efficiency but also strengthens the relationship between shippers and freight forwarders by providing increased visibility into the entire logistics process.

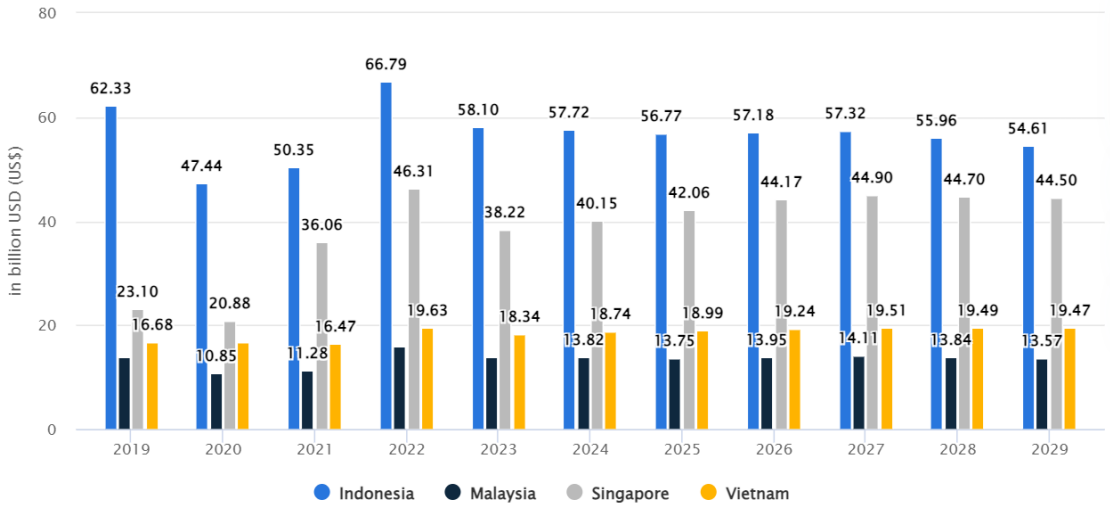

Fig. 1. Freight Forwarding Value Added (Indonesia, Malaysia, Singapore, Vietnam), 2019-2029 (in billion USD)

Notes: Data was converted from local currencies using average exchange rates of the respective year.

Source: (Statista Market Insights, 2024)

In Southeast Asia, the significance of the logistics and freight forwarding industry is evident in the market sizes of countries such as Indonesia, Malaysia, Singapore, and Vietnam. Figure 1 depicts the total value of the transportation and logistics market in these four countries from 2019 to 2029, demonstrating Indonesia's predominant position. By 2022, Indonesia's logistics market is projected to reach 66.79 billion USD, a substantial increase from 62.33 billion USD in 2019 (Statista Market Insights, 2024). This growth is primarily attributed to Indonesia's extensive domestic market, vast geography, and the rapid expansion of its e-commerce sector. However, post-2022, the market is anticipated to stabilize, reflecting both saturation and the challenges associated with sustaining high growth (Blanquart & Burmeister, 2009; Pinyanitikorn et al., 2024). While Malaysia and Singapore exhibit steady growth in logistics market size, their figures consistently remain smaller than Indonesia's. Singapore, despite its status as a major global logistics hub, possesses a relatively modest market size due to its limited geographical area, focusing more on high-value, efficient logistics rather than large-scale volume (Ganapati & Wong, 2023; Sahu et al., 2022; Wei & Li, 2024). Vietnam, conversely, demonstrates consistent growth, indicative of its emerging role in global supply chains and increasing industrialization (Phung et al., 2023).

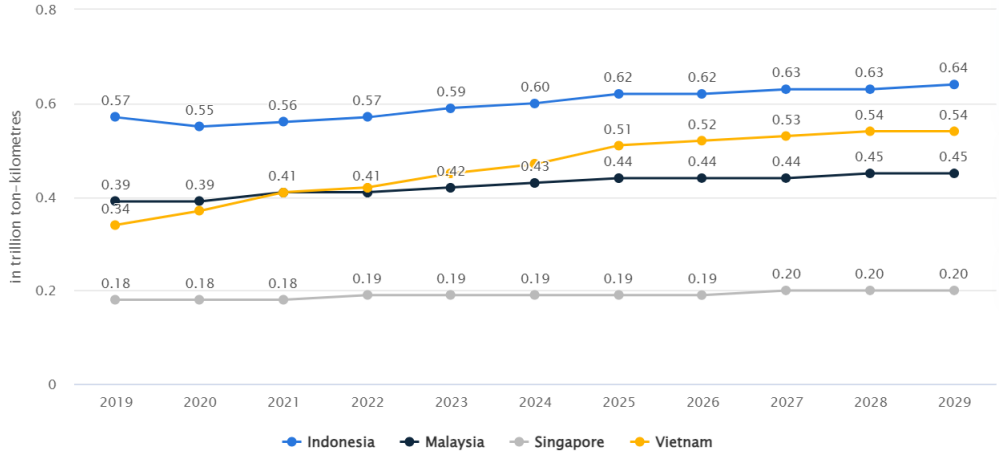

Fig. 2. Freight Transported (Indonesia, Malaysia, Singapore, Vietnam), 2019-2029 (in trillion ton-kilometers)

Source: (Statista Market Insights, 2024)

Fig. 2 illustrates freight transport performance in ton-kilometers for these four countries over the same period (Statista Market Insights, 2024). Indonesia maintains the highest total freight volume, projected to reach 0.64 trillion ton-kilometers by 2029, followed by Vietnam, which exhibits substantial growth attributed to its expanding role in global trade (Phung et al., 2023; Pinyanitikorn et al., 2024). The disparities in freight volumes among these countries underscore the varying scales of their logistics industries, with Vietnam and Indonesia emerging as the most dynamic entities in the region, driven by increasing e-commerce activities and industrial output. In Indonesia, the freight forwarding market is undergoing rapid evolution, particularly in response to the burgeoning e-commerce sector (Sidjabat et al., 2024).

Freight forwarders play a crucial role in navigating the country's complex logistics landscape, characterized by the utilization of multimodal transport solutions that incorporate sea, air, and road transportation (Blanquart & Burmeister, 2009; Sahu et al., 2022). This adaptability is essential for optimizing delivery times and minimizing costs across Indonesia's extensive archipelagic geography. Furthermore, the integration of digital technologies is transforming the logistics sector. Digital platforms, real-time tracking systems, and automated documentation processes are enhancing transparency and operational efficiency, providing businesses with improved visibility into their supply chains (Angelelli et al., 2020). This adoption of digital solutions is imperative for improving service quality, particularly as customer expectations for expeditious and reliable delivery continue to increase in response to growing e-commerce demand (Van Asch et al., 2020).

Concurrently, sustainability has emerged as a significant consideration in the freight forwarding market, both globally and within Indonesia. As logistics providers implement environmentally conscious practices such as optimizing routes to minimize fuel consumption and utilizing energy-efficient transport modes they are aligning their operations with broader sustainability objectives. These initiatives are not solely driven by corporate responsibility but also by increasing regulatory pressures to reduce environmental impacts (Luttermann et al., 2020). This transition reflects the growing importance of balancing operational efficiency and environmental sustainability in logistics operations (Huang et al., 2019).

In parallel, the behavioral factors that influence the adoption of freight forwarding services are equally significant. The relationship between desire(Lau et al., 2023; Leyva-Hernández et al., 2021), outcome expectancy(Glock & Krolak-Schwerdt, 2013; Maddux et al., 1986), perceived self-efficacy(Yousaf et al., 2021), and attitude plays a crucial role in determining the actual usage of these services(Ahmad et al., 2020; McLean et al., 2020). While sustainability initiatives can attract businesses, it is ultimately the desire for convenience, cost-effectiveness, and operational necessity that drives initial engagement. However, this desire must be supported by positive outcome expectancies, the belief that utilizing these services will lead to tangible benefits such as timely deliveries, reduced costs, and improved logistics operations. These positive expectations, combined with an individual's or business's belief in their capability to manage the logistics processes (i.e., perceived self-efficacy), contribute to a favorable attitude towards the adoption and continued use of freight forwarding services. Thus, sustainability and user attitudes toward service usage are increasingly intertwined as logistics evolve to meet contemporary demands. Perceived self-efficacy is another critical factor that influences attitude. In the logistics context, if users believe they possess the capability to effectively utilize freight forwarding services, whether through digital platforms or by managing various shipment processes, this enhances their attitude toward using these services. Higher levels of self-efficacy result in increased confidence in managing these logistics processes and interacting with service providers. When businesses or individuals perceive themselves as competent in their ability to manage these tasks, their attitude towards using freight forwarding services becomes more positive.

The previous research on freight forwarding has predominantly focused on operational aspects such as service quality, cost reduction, and digitalization strategies, including the integration of IoT and tracking systems to enhance logistics efficiency (Koh et al., 2020; Zhou & Wan, 2022). This study adopts a novel approach by examining the behavioral factors that influence the adoption and continued use of these services. This research extends beyond the conventional frameworks that investigate logistics efficiency or technological advancements by concentrating on psychological and perceptual variables, which are less explored in the context of freight forwarding. Specifically, it investigates how users' inclination to engage with freight services is influenced by their expectations of positive outcomes, their self-efficacy in managing logistics processes, and their trust in service providers to mitigate risks such as delays and damages. These aspects have been insufficiently explored in previous studies, particularly in the Indonesian context. The significance of this research is further enhanced by its incorporation of delivery risk (Osakwe et al., 2022) and perceived trust (Lavuri et al., 2022; Tian et al., 2023) as moderating factors, offering a comprehensive perspective on the barriers and enablers to service utilization.

1.1. Research Gap

This dual focus provides insight into how positive attitudes can be undermined by delivery risks and how trust-building measures can alleviate those concerns, strengthening the connection between attitude and actual service usage. This nuanced perspective on the intersection of psychological factors and risk perceptions is particularly relevant in the Indonesian market, where logistical challenges and infrastructure limitations can elevate perceptions of risk. Previous research on freight forwarding has typically concentrated on operational aspects such as service quality, cost reduction, and digitalization strategies, e.g., the integration of IoT and tracking systems to enhance logistics efficiency (Koh et al., 2020; Zhou & Wan, 2022). This study adopts a novel approach by examining the behavioral factors that influence the adoption and continued use of these services. This research extends beyond conventional frameworks that examine logistics efficiency or technological advancements by focusing on psychological and perceptual variables, which are less explored in the context of freight

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1.2. Novelty

Social Cognitive Theory (SCT) (Bandura, 1986)serves as the grand theory to elucidate the relationships among the variables, providing a comprehensive framework for understanding how individual behaviors are influenced by cognitive, environmental, and personal factors. SCT is particularly pertinent to this study as it emphasizes the interaction between personal cognition (desire, outcome expectancy, perceived self-efficacy) and external environmental factors (delivery risk and perceived trust). This research endeavors to address these challenges by examining the factors that influence the actual usage of freight forwarding services in Indonesia. Specifically, it focuses on variables such as desire, outcome expectations, and perceived self-efficacy, while investigating the moderating roles of delivery risk and perceived trust. As the Indonesian logistics industry continues to adapt to global trends in digitalization and sustainability, comprehending these drivers is crucial for businesses seeking to enhance service adoption and performance in a rapidly evolving market.

2. Theoretical Foundation

SCT, initially developed by Bandura (1986), provides a comprehensive framework for understanding how individual behavior is influenced by the interaction of cognitive, environmental, and personal factors. Originally conceptualized as a theory to elucidate human motivation and learning, SCT has evolved to encompass broader applications, such as health behaviors (Fahlevi & Alharbi, 2021), organizational behavior (Ekowati et al., 2023; Shah et al., 2023), and more recently, logistics and service adoption (Rajesh et al., 2023; Van Asch et al., 2020). Central to SCT is the concept of reciprocal determinism, which posits that an individual's behavior, personal cognitive factors (such as beliefs, expectations, and self-efficacy) (Carillo, 2010), and the environment in which they operate are all interconnected and exert mutual influence (Abbas et al., 2022). This interaction elucidates why certain behaviors are adopted or rejected in various contexts (Sahir et al., 2021). In the present study, this implies that both internal cognitive factors, such as desire, outcome expectancy, and perceived self-efficacy, and external environmental factors, such as delivery risk and perceived trust, interact to determine whether a company or individual opts to engage with freight forwarding services.

In this study, desire refers to a user's motivation to engage with these services, often driven by the necessity for efficient and cost-effective logistics solutions. This desire is further influenced by outcome expectancies, which pertain to the belief that utilizing freight forwarding services will result in positive outcomes, such as timely deliveries and cost savings. SCT posits that these outcome expectancies are critical in shaping an individual's decision to act; if the anticipated outcomes align with their needs and desires, they are more likely to utilize these services. Another key concept in SCT, self-efficacy, plays a central role in determining whether an individual will take action (Myers & Horswill, 2006). In this model, perceived self-efficacy refers to the confidence that users possess in their ability to successfully navigate the logistics process, including interacting with freight forwarders and managing the complexities of shipments. Higher self-efficacy generally leads to more favorable attitudes towards service usage, as individuals believe they possess the capability to overcome challenges. This self-efficacy aligns with Bandura's perspective that belief in one's abilities strongly influences the motivation to engage in behaviors, particularly in settings requiring skill or management of complex tasks(Kirsch, 1995).

In addition to personal cognitive factors, SCT emphasizes the significance of environmental factors that either facilitate or impede behavior (Fahlevi et al., 2023). In the freight forwarding model, delivery risk and perceived trust function as moderating environmental factors. Delivery risk, such as the potential for delays or damaged goods, can diminish a user's inclination to engage with freight services, even if they possess a strong desire or high outcome expectations (Raihan et al., 2024). Conversely, perceived trust in the freight forwarding provider can substantially enhance the relationship between positive attitudes and actual usage (Sutia et al., 2020). When users perceive their chosen provider as reliable and transparent, it mitigates concerns about risks, thereby facilitating increased engagement with the services.

In applying SCT to this model, the theory provides a structured framework for comprehending how the interaction of personal beliefs and external conditions influences freight forwarding service adoption. By utilizing SCT, this research elucidates the complexity of decision-making in logistics, explicating not only the operational efficiency of freight services but also how cognitive factors such as desire, expectations, and self-efficacy are fundamental to forming positive attitudes toward these services, and how these attitudes translate into actual usage contingent upon the level of perceived risk and trust. Consequently, SCT offers a robust theoretical framework for elucidating how logistics providers can enhance service adoption by addressing both cognitive and environmental influences on user behavior.

3. Methodology

This study was conducted in three major urban centers in Indonesia: Jakarta, Surabaya, and Makassar, which serve as crucial logistics hubs with substantial freight forwarding operations. These metropolitan areas represent a diverse sample in terms of economic scale and logistics infrastructure, facilitating a comprehensive analysis of the factors influencing the utilization of freight forwarding services in Indonesia.

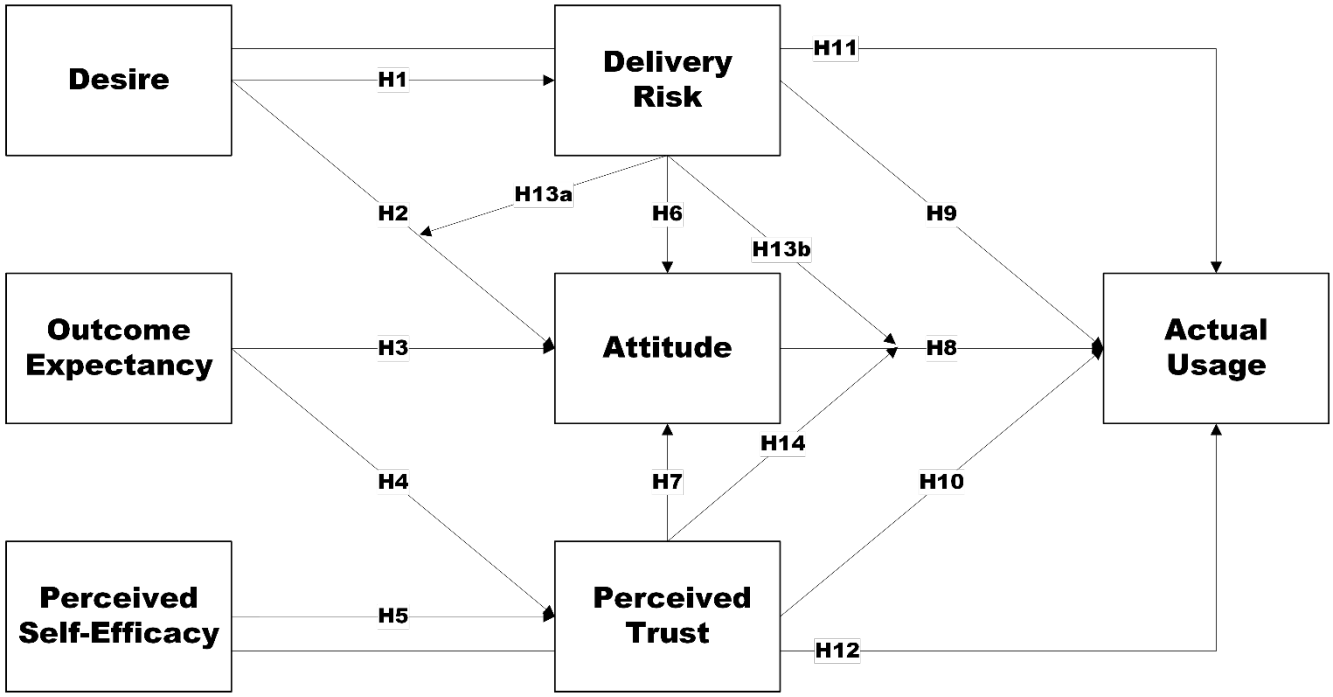

Fig. 3. Research Framework

The research framework illustrated in Fig. 3 delineates the interrelationships among the key constructs—Desire, Outcome Expectancy, Perceived Self-Efficacy, Delivery Risk, Perceived Trust, Attitude, and Actual Usage and their impact on the adoption of freight forwarding services.

3.1. Sampling Method and Sample Size

Random sampling was employed to ensure that each potential respondent had an equal probability of selection (Saunders et al., 2009; Sekaran & Bougie, 2016), thereby mitigating selection bias and enhancing the generalizability of the findings. A total of 616 respondents were selected, comprising businesses and individuals who frequently utilize freight forwarding services in the target cities. This sample size was determined using an equation derived from Cochran's formula (Cochran, 1977)for sample size estimation, which is commonly utilized in social science research to predict the minimum number of respondents required for reliable statistical inference:

$$n_0 = \frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

where:

- n is the required sample size,
- Z is the Z-value (typically 1.96 for a 95% confidence level),
- p is the estimated proportion of the population (we assume 0.5 for maximum variability),
- e is the margin of error (set at 5%, or 0.05).

$$n_0 = \frac{3.8416 \cdot 0.25}{0.0025} = 384.16$$

Utilizing this formula, the minimum required sample size was calculated to be approximately 385 respondents. However, given the complexity and diversity of the freight forwarding market, the sample size was expanded to 616 to ensure more robust data and account for non-responses and potential variances across different cities. Data were collected using a structured questionnaire(Arsyah & Pakri, 2024; Nurwahyuni et al., 2021)distributed to businesses and individual users of freight

forwarding services in Jakarta, Surabaya, and Makassar. The target population included a broad range of users, from individual shippers to large businesses, to ensure a diverse representation of freight forwarding service users across the three cities. The research team initially distributed 683 questionnaires. These were disseminated both in person and through online platforms, allowing respondents flexibility in their participation. After a thorough follow-up process, which included reminder emails and telephone calls, a total of 616 valid responses were successfully completed and returned, resulting in a participation rate of approximately 90.18%. This participation rate is considered exceptionally high for a survey of this nature, particularly given the geographic and logistical diversity of the respondents. It indicates a significant interest in the subject matter and suggests that respondents found the topic relevant to their business operations. Furthermore, the high response rate mitigates concerns about non-response bias, ensuring that the results of the study are more representative of the overall population.

$$\text{Participation Rate} = \frac{\text{Number of valid responses}}{\text{Total questionnaires distributed}} \times 100 = \frac{616}{683} \times 100 \approx 90.18\%$$

This substantial level of engagement across the three cities enhances the validity of the data and supports the reliability of the findings, thereby ensuring that the study can accurately represent the behaviors and attitudes of freight forwarding users in Indonesia.

3.2. Measurement

In this investigation, we evaluated the constructs of desire, outcome expectancy, perceived self-efficacy, delivery risk, attitude, perceived trust, and actual usage utilizing a structured questionnaire. Each construct was assessed using multiple items derived from extant literature and adapted to the context of freight forwarding services. We employed Confirmatory Factor Analysis (CFA) and factor loadings (FL) to evaluate the magnitude of each item's contribution to its respective construct. Furthermore, we calculated Composite Reliability (CR) and Average Variance Extracted (AVE) to assess the reliability and convergent validity of the constructs. In accordance with established guidelines, items with factor loadings below 0.7 were considered for elimination, as values below this threshold indicate an insufficient relationship between the item and the construct. Subsequent to the removal of this item, the overall reliability and validity of the Perceived Self-Efficacy construct improved, as evidenced by the recalculated CR and AVE values.

Table 1
Measurement Model Results

Construct	Item Code	Item Statement	FL	CR	AVE
Desire	DS1	I feel motivated to use freight forwarding services frequently.	0.89	0.88	0.81
	DS2	I have a strong interest in using freight forwarding services for my business needs.	0.91	7	4
	DS3	I often seek out freight forwarding services for my logistics requirements.	0.89		
Outcome Expectancy	OE1	I believe using freight forwarding services will improve my business efficiency.	0.92	0.91	0.84
	OE2	I expect that freight forwarding services will enhance my overall logistics management.	0.84	8	8
Perceived Self-Efficacy	PSE2	I am confident in my ability to utilize freight forwarding services effectively.	0.65	0.77	0.68
	PSE3	I feel capable of managing the logistics of freight forwarding services on my own.	0.94	2	4
Delivery Risk	DR1	I worry about potential delays when using freight forwarding services.	0.82	0.75	0.65
	DR2	I am concerned about the reliability of delivery schedules in freight forwarding.	0.79	0	8
	DR3	I consider delivery risk a critical factor when choosing a freight forwarding service provider.	0.81		
Attitude	ATT	I have a positive attitude toward using freight forwarding services.	0.87	0.83	0.74
	ATT	I believe freight forwarding services provide good value for my business.	0.86	4	9
	ATT	I am inclined to recommend freight forwarding services to others in my network.	0.85		
Perceived Trust	PT2	I trust that freight forwarding services will deliver my goods safely and on time.	1.00	1.00	1.00
Actual Usage	AU1	I always using freight forwarding services for my future shipments.	0.87	0.87	0.79
	AU2	I will likely choose freight forwarding services over other logistics options.	0.86	6	9
	AU3	I am satisfied with the performance of freight forwarding services I've used.	0.87		

This meticulous refinement of measurement items ensures that only the most reliable and valid items contribute to the model (see Table 1), enhancing the overall robustness of the study's findings. The respondents were requested to evaluate these variables using a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). A 7-point Likert scale provides greater granularity compared to a 5-point scale (Likert, 1932). It enables respondents to express their level of agreement or disagreement with increased nuance, capturing subtle differences in attitudes and perceptions. This level of detail is crucial in this study, as the variables being measured, such as desire, outcome expectancy, perceived self-efficacy, delivery risk, and perceived trust, are complex and may involve varying degrees of agreement or confidence. A broader scale facilitates differentiation between respondents who hold strong opinions regarding certain aspects of freight forwarding services and those who maintain more moderate or neutral perspectives.

3.3. Data Analysis

The collected data were analyzed utilizing SmartPLS 4 (Hair et al., 2017; Ringle et al., 2020), a sophisticated software for Partial Least Squares Structural Equation Modeling (PLS-SEM). PLS-SEM is particularly appropriate for this research as it facilitates the examination of complex relationships between latent variables, even in the absence of normal data distribution.

SmartPLS 4 was employed to evaluate the hypothesized relationships between desire, outcome expectancy, perceived self-efficacy, delivery risk, perceived trust, attitude, and actual usage of freight forwarding services. SmartPLS 4 is a suitable tool for this study due to its capacity to manage complex models with moderating variables such as delivery risk and perceived trust. Moreover, PLS-SEM is optimal for predictive models and exploratory research, rendering it appropriate for a study of this nature, which aims to elucidate behavioral intentions and actual usage patterns in a dynamic and under-researched context such as Indonesia's freight forwarding industry. The tool's non-parametric nature also enhances its adaptability to various sample sizes and distributions (Sarstedt et al., 2017), which is especially significant when analyzing diverse populations across Jakarta, Surabaya, and Makassar.

4. Finding and Discussion

4.1. Profile Respondent

Table 2 presents the demographic and business-related characteristics of the 616 respondents who participated in this study, including their age, gender, business size, years of experience utilizing freight forwarding services, and location. The data collected from these key categories provide a comprehensive overview of the respondent pool, reflecting the diverse range of businesses and individual users of freight forwarding services across three major urban centers: Jakarta, Surabaya, and Makassar.

Table 2
Characteristics Respondent

Category	Subcategory	Frequency	Percentage
Age	18-30	156	25.3%
	31-45	285	46.3%
	46-60	111	18.0%
	60+	64	10.4%
Gender	Male	366	59.4%
	Female	250	40.6%
Business Size	Small (1-50 employees)	244	39.6%
	Medium (51-250 employees)	223	36.2%
	Large (251+ employees)	149	24.2%
Years Using Freight Forwarding	Less than 1 year	102	16.6%
	1-3 years	180	29.2%
	4-6 years	189	30.7%
	More than 6 years	145	23.5%
City	Jakarta	230	37.3%
	Surabaya	206	33.4%
	Makassar	180	29.2%

The age distribution indicates that most respondents (46.3%) are between the ages of 31-45, followed by 25.3% aged 18-30. A smaller proportion of respondents (18.0%) fall within the 46-60 age range, and only 10.4% are over 60 years old. This distribution suggests that freight forwarding services are predominantly utilized by a relatively young to middle-aged demographic, potentially reflecting the active involvement of younger generations in logistics and e-commerce-driven industries. Regarding gender, the majority of respondents are male (59.4%), with females comprising 40.6%. This gender distribution may reflect the traditionally male-dominated nature of the logistics and freight forwarding industry, although the significant female participation highlights increasing gender diversity in this sector.

Analysis of business size data reveals that 39.6% of the respondents operate small businesses with 1-50 employees, while 36.2% represent medium-sized businesses (51-250 employees). Larger businesses with over 251 employees constitute 24.2% of the respondents. This heterogeneous distribution of business sizes demonstrates the extensive applicability and utility of freight forwarding services, which accommodate both small-scale enterprises and larger corporations.

The duration of experience utilizing freight forwarding services represents a significant dimension, with 30.7% of respondents possessing 4-6 years of experience, followed by 29.2% with 1-3 years of experience. Notably, 23.5% of respondents have more than 6 years of experience, indicating a substantial cohort of experienced users. Concurrently, 16.6% have less than 1 year of experience, suggesting that freight forwarding services continue to attract new clientele. Regarding geographical distribution, the majority of respondents are located in Jakarta (37.3%), followed by Surabaya (33.4%) and Makassar (29.2%). This distribution reflects the significance of these cities as key logistics hubs in Indonesia, with Jakarta representing the largest market for freight forwarding services.

4.2. Common Method Bias (CMB)

Table 3 presents the results of the Common Method Bias (CMB) test utilizing Variance Inflation Factor (VIF) for the inner model. The VIF values are employed to detect potential multicollinearity issues, which may indicate the presence of common method bias in the data. In this context, multicollinearity occurs when independent variables in the model exhibit high correlation, potentially leading to inflated standard errors and unreliable coefficient estimates.

Table 3
VIF Inner Model

Inner Path	VIF
ATT → AU	1.227
DR → ATT	1.618
DR → AU	1.215
DS → ATT	1.722
OE → ATT	1.175
PSE → ATT	1.259
PT → ATT	1.360
PT → AU	1.053

A general guideline for Variance Inflation Factor (VIF) values suggests that they should not exceed 5, and optimally should be below 3.3 (Kock, 2015), to mitigate multicollinearity concerns. In this investigation, all VIF values are substantially below the threshold of 3, ranging from 1.053 to 1.722. This indicates the absence of significant multicollinearity in the model, and the risk of common method bias is minimal. Upon examination of the table, it is evident that the highest VIF value is associated with the path DS (Desire) → ATT (Attitude), at 1.722, which remains well within the acceptable range. This suggests that while a moderate correlation exists between desire and attitude, it is not sufficiently strong to induce multicollinearity issues or common method bias. The lowest VIF value of 1.053 is observed in the path PT (Perceived Trust) → AU (Actual Usage), indicating a minimal relationship between these variables in terms of common variance.

4.3. Discriminant Validity

Table 4 presents the Heterotrait-Monotrait Ratio (HTMT), which constitutes a critical criterion for evaluating discriminant validity in structural equation modeling (SEM). Discriminant validity denotes the extent to which distinct constructs are differentiated from one another. To establish discriminant validity utilizing HTMT, the ratio between traits should generally not exceed 0.85, and in certain instances, a more stringent threshold of 0.90 is employed.

Table 4
HTMT

	ATT	DR	DS	AU	OE	PSE	PT
ATT							
DR	0.416						
DS	0.535	0.711					
AU	0.666	0.444	0.566				
OE	0.125	0.106	0.115	0.079			
PSE	0.087	0.046	0.068	0.089	0.387		
PT	0.170	0.073	0.080	0.095	0.351	0.438	

The HTMT values presented in Table 4 demonstrate that all construct pairings meet the recommended threshold, with no values exceeding 0.711, which is substantially below the more stringent limit of 0.90. For instance, the HTMT value between Desire (DS) and Attitude (ATT) is 0.535, indicating a moderate relationship between these two constructs while maintaining their distinctiveness. Similarly, the highest observed HTMT value of 0.711, between Delivery Risk (DR) and Desire (DS), further substantiates that these constructs are sufficiently differentiated, thereby ensuring that discriminant validity is not compromised.

Table 5 presents the Fornell-Larcker criterion, an alternative method for assessing discriminant validity. According to the Fornell-Larcker criterion, to establish discriminant validity, the square root of the Average Variance Extracted (AVE) for each construct (represented by the diagonal values in the table) should exceed the correlations between that construct and other constructs. This criterion ensures that each construct exhibits greater shared variance with its own indicators than with any other construct.

Table 5
Fornell Larcker

	ATT	DR	DS	AU	OE	PSE	PT
ATT	0.866						
DR	0.324	0.812					
DS	0.461	0.591	0.902				
AU	0.570	0.357	0.499	0.894			
OE	0.105	0.082	0.100	0.068	0.924		
PSE	0.064	0.027	0.051	0.065	0.236	0.832	
PT	0.155	0.011	0.076	0.089	0.319	0.347	1.000

Table 5 demonstrates that the square root of the Average Variance Extracted (AVE) for each construct, presented on the diagonal, exceeds any off-diagonal correlations. For instance, the value for Attitude (ATT) is 0.866, which surpasses its

correlation with other constructs, such as Desire (DS) at 0.461 or Delivery Risk (DR) at 0.324. Likewise, for Outcome Expectancy (OE), the diagonal value (0.924) exceeds its correlations with other constructs, such as Attitude (ATT) at 0.105 or Perceived Self-Efficacy (PSE) at 0.236.

4.4. Model Fit

Table 6 elucidates the key metrics utilized for evaluating model fit and variance explained by the constructs in the model. The table below presents a summary of the model fit indices for both the Saturated Model and Estimated Model, in conjunction with the R-square and R-square adjusted values for the constructs of Attitude (ATT) and Actual Usage (AU). These metrics provide insight into the model's goodness of fit to the data and the proportion of variance in the dependent variables that is accounted for by the independent variables.

Table 6
Model fit and R-square

Model Fit Index	Saturated Model	Estimated Model	R-square	R-square Adjusted
SRMR	0.061	0.067	ATT	0.252
d_ULS	0.568	0.694	AU	0.369
d_G	0.311	0.313	ATT	0.238
Chi-square	1.190.666	1.177.192	AU	0.364

The Standardized Root Mean Square Residual (SRMR), a critical indicator of model fit, demonstrates values of 0.061 for the Saturated Model and 0.067 for the Estimated Model. An SRMR value below 0.08 denotes a good model fit, suggesting that both models exhibit an acceptable level of fit with the data. The d_ULS (Unweighted Least Squares Discrepancy) and d_G (Geodesic Discrepancy) indices further evaluate the goodness of fit, with both models demonstrating comparable values (e.g., d_ULS at 0.568 for the Saturated Model and 0.694 for the Estimated Model). These values also indicate that the models adequately fit the observed data. The Chi-square values for both models are provided, with the Saturated Model exhibiting a value of 1.190.666 and the Estimated Model slightly lower at 1.177.192. Lower chi-square values indicate a better fit; however, given the large sample size, chi-square should be interpreted with caution as it can be sensitive to sample size. Regarding explained variance, the R-square values for Attitude (ATT) and Actual Usage (AU) are presented. ATT has an R-square of 0.252, indicating that approximately 25.2% of the variance in Attitude is explained by the independent variables. AU has a higher R-square value of 0.369, signifying that about 36.9% of the variance in Actual Usage is explained by the predictors. The adjusted R-square values, which account for the number of predictors in the model, are slightly lower, with 0.238 for ATT and 0.364 for AU.

4.5. Path Analysis

Table 7 presents the Path Coefficients, which provide the statistical results of the structural model testing, including the direct and moderating relationships between the constructs in this study. The table comprises the path coefficients (O), mean values (M), standard deviations (STDEV), t-statistics (|O/STDEV|), and p-values for each hypothesis, along with the determination of whether the hypothesis was supported or not.

Table 7
Path Coefficients

Hypothesis		(O)	(M)	(STDEV)	(|O/STDEV|)	P values	Decision
H1	DS → DR	0.589	0.592	0.031	19.046	0.000	Supported
H2	DS → ATT	0.458	0.457	0.036	12.514	0.000	Supported
H3	OE → ATT	0.016	0.049	0.042	1.136	0.128	Not Supported
H4	OE → TD	0.247	0.223	0.041	5.735	0.000	Supported
H5	PSE → TD	0.286	0.258	0.040	6.003	0.000	Supported
H6	DR → ATT	0.046	0.079	0.047	1.601	0.055	Not Supported
H7	TD → ATT	0.118	0.115	0.042	2.833	0.002	Supported
H8	ATT → AU	0.484	0.485	0.041	11.828	0.000	Supported
H9	DR → AU	0.219	0.218	0.042	5.205	0.000	Supported
H10	TD → AU	0.018	0.017	0.031	0.561	0.287	Not Supported
H11	DS → DR → AU	0.129	0.122	0.024	5.102	0.000	Supported
H12	PSE → TD → AU	0.031	0.031	0.016	1.888	0.030	Supported
H13a	DR × DS → ATT	0.101	0.091	0.036	2.479	0.007	Supported
H13b	DR × ATT → AU	-0.110	-0.106	0.056	1.900	0.029	Supported
H14	TD × ATT → AU	0.039	0.042	0.040	1.033	0.151	Not Supported

The analysis of the path coefficients reveals several significant relationships within the model. The primary finding indicates that Desire (DS) exerts a strong influence on Delivery Risk (DR), as evidenced by a path coefficient of 0.589 and a t-statistic of 19.046 (p-value = 0.000). This suggests that individuals with a pronounced desire to utilize freight forwarding services are more inclined to evaluate potential risks, presumably due to elevated expectations for timely and reliable service. Similarly, desire significantly influences Attitude (ATT), with a path coefficient of 0.458 and a t-statistic of 12.514 (p-value = 0.000).

This demonstrates that desire plays a crucial role in shaping users' attitudes toward freight forwarding services. Conversely, the relationship between Outcome Expectancy (OE) and Attitude (ATT) is not statistically significant. The path coefficient of 0.016, combined with a t-statistic of 1.136 and a p-value of 0.128, indicates that expectations of positive outcomes from service utilization do not significantly affect users' attitudes. However, Outcome Expectancy (OE) does significantly impact Perceived Trust (TD), as demonstrated by a path coefficient of 0.247 and a t-statistic of 5.735 (p-value = 0.000), suggesting that users' trust in freight forwarding services increases when they anticipate favorable outcomes from service utilization.

The influence of Perceived Self-Efficacy (PSE) on Perceived Trust (TD) is statistically significant, with a path coefficient of 0.286 and a t-statistic of 6.003 (p-value = 0.000). This finding suggests that individuals who exhibit confidence in their ability to manage freight forwarding services are more inclined to trust the service providers. Conversely, the path from Delivery Risk (DR) to Attitude (ATT) was not found to be statistically significant, with a path coefficient of 0.046, a t-statistic of 1.601, and a p-value of 0.055, indicating that perceptions of risk do not directly influence attitudes toward the services. Perceived Trust (TD) significantly affects Attitude (ATT), as evidenced by a path coefficient of 0.118 and a t-statistic of 2.833 (p-value = 0.002). This result indicates that trust in the service provider contributes to a positive attitude toward utilizing freight forwarding services. Furthermore, Attitude (ATT) strongly influences Actual Usage (AU), with a path coefficient of 0.484 and a t-statistic of 11.828 (p-value = 0.000), confirming that a favorable attitude is a robust predictor of actual service utilization.

Delivery Risk (DR) demonstrates a direct influence on Actual Usage (AU), as evidenced by a path coefficient of 0.219, a t-statistic of 5.205, and a p-value of 0.000, indicating that perceptions of risk can directly affect users' decisions to utilize freight forwarding services. However, the path from Perceived Trust (TD) to Actual Usage (AU) is not statistically significant, with a path coefficient of 0.018, a t-statistic of 0.561, and a p-value of 0.287, suggesting that trust alone does not drive usage decisions.

The indirect path from Desire (DS) to Actual Usage (AU) through Delivery Risk (DR) demonstrates statistical significance, with a path coefficient of 0.129, a t-statistic of 5.102, and a p-value of 0.000, supporting the hypothesis that delivery risk functions as a moderating variable between desire and actual usage. Similarly, the indirect path from Perceived Self-Efficacy (PSE) to Actual Usage (AU) through Perceived Trust (TD) exhibits statistical significance, with a path coefficient of 0.031, a t-statistic of 1.888, and a p-value of 0.030, suggesting that self-efficacy enhances trust, which subsequently influences usage. The interaction between Delivery Risk (DR) and Desire (DS) on Attitude (ATT) is statistically significant, with a path coefficient of 0.101, a t-statistic of 2.479, and a p-value of 0.007, indicating that delivery risk can moderate the effect of desire on attitude, potentially strengthening or weakening the relationship depending on the level of perceived risk. The interaction effect between Delivery Risk (DR) and Attitude (ATT) on Actual Usage (AU) is also statistically significant, with a negative path coefficient of -0.110, a t-statistic of 1.900, and a p-value of 0.029, suggesting that high delivery risk can attenuate the positive impact of attitude on usage. However, the interaction between Perceived Trust (TD) and Attitude (ATT) on Actual Usage (AU) does not demonstrate statistical significance, with a path coefficient of 0.039, a t-statistic of 1.033, and a p-value of 0.151, indicating that trust does not moderate the attitude-usage relationship.

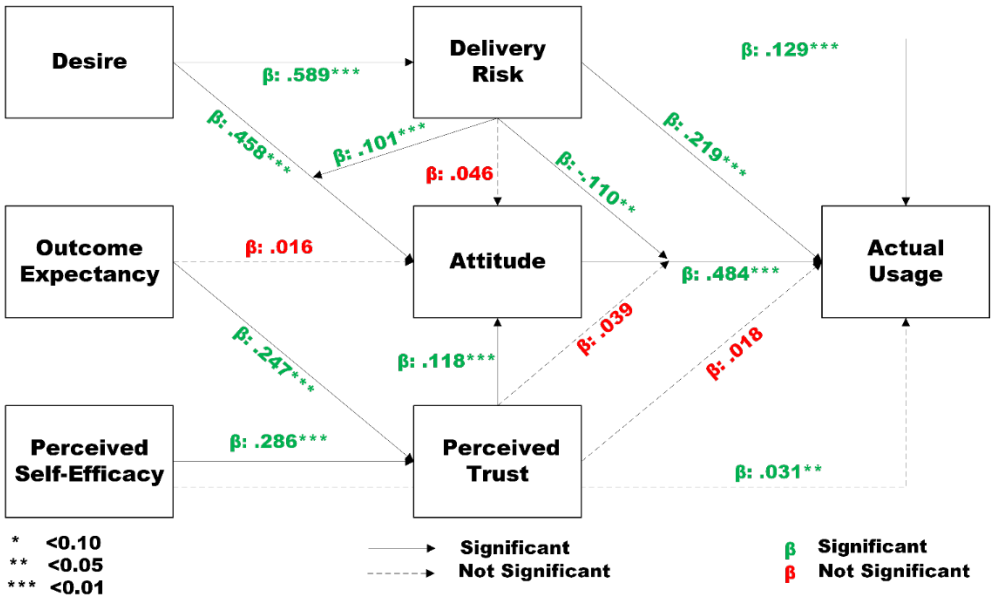

Fig. 4. Findings Summary

The results of the path analysis in Fig. 4 reveal varying strengths of relationships between the variables in the model, elucidating both the strongest and weakest influences on Attitude (ATT) and Actual Usage (AU) of freight forwarding services. The most substantial influence in the model is the direct effect of Desire (DS) on Delivery Risk (DR). With a path coefficient of 0.589 and a t-statistic of 19.046, this relationship demonstrates that individuals with a stronger desire for freight forwarding

services are more likely to evaluate and perceive potential delivery risks. This suggests that the desire to utilize the services motivates users to critically assess the risks associated with timely deliveries and potential service issues. The magnitude of this influence underscores the critical role that desire plays in shaping risk perceptions. Similarly, Attitude (ATT) on Actual Usage (AU) also exhibits a strong influence, with a path coefficient of 0.484 and a t-statistic of 11.828. This relationship confirms that positive attitudes toward freight forwarding services are a significant predictor of whether users will engage with the services. This result emphasizes the importance of cultivating a favorable attitude to drive usage, as those with a strong positive attitude are significantly more likely to utilize freight forwarding services consistently.

Conversely, the weakest influence is observed in the relationship between Perceived Self-Efficacy (PSE) and Attitude (ATT), with a path coefficient of 0.000 and a t-statistic of 0.003. This finding suggests that users' perceived competence in managing logistics does not significantly influence their attitude toward freight forwarding services. Although self-efficacy may contribute to shaping trust (as evidenced by the significant path between PSE and Perceived Trust (TD)), it does not directly affect attitudes in this context. Another weak relationship is observed in the path from Outcome Expectancy (OE) to Attitude (ATT), which exhibits a path coefficient of 0.016 and a t-statistic of 1.136. This result implies that users' expectations regarding the benefits of freight forwarding services do not substantially impact their attitudes toward these services. While one might hypothesize that positive outcome expectancies would influence attitudes, this finding indicates that other factors, such as desire and trust, play a more significant role in attitude formation.

4.6. Discussion

Grounded in SCT, this study elucidates the interaction between personal cognitive factors, such as desire, outcome expectancy, and perceived self-efficacy, and environmental factors, including delivery risk and perceived trust, in shaping users' attitudes and driving actual usage. The findings align with the principles of SCT, which emphasize the interplay between individual cognition and external influences in determining behavior (Bandura, 1986). Desire emerged as a critical factor in this model, significantly influencing both attitude and delivery risk. This observation reflects the notion that individuals with a strong desire to utilize freight forwarding services actively assess potential risks and form favorable attitudes, confirming the motivational role that desire plays in behavior adoption (Rajesh et al., 2023). In Indonesia, the rapid growth of e-commerce and increasing reliance on logistics networks have heightened the significance of efficient delivery systems (Luttermann et al., 2020). The finding that desire strongly influences delivery risk perceptions suggests that Indonesian businesses and consumers exhibit high sensitivity to logistics performance, particularly as they increasingly depend on these services to support business operations.

The relationship between attitude and actual usage demonstrated a significant correlation, underscoring the importance of cultivating positive attitudes to promote continued engagement with freight forwarding services. This finding aligns with previous research indicating that attitudes play a pivotal role in predicting usage behavior, particularly in contexts where the service is essential to business success (Verschuur et al., 2022). For Indonesian logistics providers, this implies that developing marketing strategies that enhance user attitudes—such as by emphasizing service reliability and customer satisfaction—will be crucial in driving usage, especially as the sector continues to expand in size and significance. Notably, the results indicate that outcome expectancy and perceived self-efficacy have weaker or non-significant direct effects on attitude, diverging from some previous studies that emphasized the importance of expected outcomes in shaping attitudes (Subhashini & Preetha, 2018). In the Indonesian context, where logistical challenges such as infrastructure limitations and regulatory complexities are prevalent, these findings suggest that users may be less focused on potential outcomes and more concerned with the immediate risks and challenges inherent in the logistics process. This underscores the unique characteristics of the Indonesian freight forwarding market, where the unpredictability of delivery systems could potentially mitigate the influence of expected long-term benefits.

Perceived trust also played a significant role in shaping attitude, reinforcing the importance of trust-building in logistics services. Freight forwarding services in Indonesia, particularly those handling international shipments, face considerable challenges related to reliability, customs clearance, and timeliness (Huang et al., 2019). Trust in the service provider's ability to navigate these challenges is, therefore, crucial for users. The study's findings support the notion that logistics providers in Indonesia need to prioritize transparency, consistent communication, and service reliability to build trust and foster positive attitudes toward usage. The moderating roles of delivery risk and perceived trust provide further insights into the dynamics of freight forwarding service adoption. The significant moderating effect of delivery risk on the relationship between desire and attitude demonstrates that high delivery risks can attenuate even the strongest motivations for service use. This is especially pertinent in Indonesia, where logistical infrastructure, geographic dispersion, and regulatory hurdles create substantial delivery risks (Luttermann et al., 2020). Consequently, freight forwarders must actively mitigate these risks by improving service reliability, offering guarantees, and enhancing supply chain transparency to ensure that desire leads to positive attitudes and increased usage.

The novelty of this research lies in its focus on the behavioral factors that influence freight forwarding service adoption, a departure from traditional studies that primarily concentrate on operational efficiency or technological integration (Koh et al., 2020; Zhou & Wan, 2022). By investigating psychological and perceptual variables such as desire, outcome expectancy, and self-efficacy, this study offers a novel perspective on the user-side drivers of logistics service adoption, particularly in the underexplored context of Indonesia. Furthermore, the inclusion of delivery risk and perceived trust as moderators provides a

more comprehensive understanding of the barriers and facilitators of service usage, which has not been extensively examined in previous research. In applying Social Cognitive Theory (SCT) to this context, the research demonstrates how individual cognitive factors, such as desire and self-efficacy, interact with environmental factors like delivery risk to influence behavior. The SCT framework elucidates the complex dynamics at play in the Indonesian logistics sector, where external uncertainties and perceived risks often moderate the influence of individual desires and capabilities. This theoretical application is particularly relevant in Indonesia, a country that faces unique logistical challenges due to its archipelagic geography and regulatory environment, rendering the management of delivery risks and the establishment of trust critical for service adoption.

5. Conclusions

The findings of this study underscore the significance of comprehending both personal motivations and external risk factors in influencing the adoption of freight forwarding services in Indonesia. This research provides valuable insights for logistics providers, suggesting that efforts to cultivate positive attitudes, mitigate delivery risks, and establish trust will be crucial to enhancing service utilization in this rapidly expanding market. The originality of this research contributes to the broader literature by integrating behavioral factors into the study of freight forwarding services, offering novel perspectives that can inform strategies for service providers both in Indonesia and globally. Despite the valuable insights generated by this research, several limitations warrant acknowledgment. The study is geographically confined to Jakarta, Surabaya, and Makassar, three of Indonesia's major cities. While these cities are key logistical hubs, they may not fully represent the diverse logistical challenges and user behaviors across the entire Indonesian archipelago, particularly in more remote or underdeveloped regions. Future research could expand the geographical scope to include other cities or rural areas to gain a more comprehensive understanding of the country's freight forwarding market. The model focuses on cognitive and perceptual variables based on Social Cognitive Theory (SCT), but it does not extensively consider other potentially important factors such as economic conditions, competitive pressures, or technological innovations in the freight forwarding industry. These external factors can have significant impacts on both service providers and users, influencing their perceptions and behaviors. Including these variables in future research could provide a more holistic view of the factors influencing freight forwarding service adoption in Indonesia.

For logistics service providers, the findings underscore the critical importance of establishing trust and mitigating delivery risks to foster positive attitudes and encourage actual usage. Providers should prioritize improving service reliability, implementing transparent tracking systems, and enhancing customer service to address common concerns related to delivery delays or risks. Given the strong correlation between desire and delivery risk, providers should also actively manage customer expectations, particularly for high-value shipments, where the consequences of delays or damage can be substantial. From a policy perspective, the research emphasizes the necessity for infrastructure improvements and regulatory reforms that reduce delivery risks, which constitute a significant barrier to service adoption. Policymakers in Indonesia could focus on investing in logistics infrastructure, particularly in more remote regions, to ensure that freight forwarding services can operate more reliably and efficiently across the archipelago. Additionally, establishing regulatory frameworks that promote transparency and accountability in the logistics sector can further enhance trust between service providers and users, thereby improving the overall competitiveness of Indonesia's logistics market.

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