The Impact of Delivery Performance on Customer Satisfaction in Malaysian E-Commerce: A Comparative Analysis and Strategic Framework

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ABSTRACT

The rapid growth of e-commerce in Malaysia has made last-mile delivery a vital component for ensuring customer satisfaction. Despite this growth, both anecdotal and empirical data highlight a gap between what consumers expect and the service they receive. This thesis examines the impact of four key delivery factors — speed, accuracy, reliability, and communication —on customer satisfaction in the Malaysian e-commerce market. Using a quantitative method, the study analyses survey data from 150 Malaysian consumers and compares the results with global industry standards from companies like Amazon and UPS. The results show a paradox: although speed is highly valued locally, delivery accuracy and proactive communication are the strongest predictors of satisfaction. The research extends the Expectation-Confirmation Theory (ECT) by empirically demonstrating the importance of these factors in a local context. Finally, it offers a strategic framework for e-commerce platforms, logistics providers, and policymakers, focusing on technology, transparency, and localized approaches to close performance gaps and build long-term loyalty and competitiveness.

Keywords: E-commerce; Last-mile delivery; Customer satisfaction; Malaysia; Logistics

INTRODUCTION

Background

The global digital economy has been fundamentally reshaped by the proliferation of e-commerce, which has transformed consumer behaviour and reshaped supply chains worldwide. In Southeast Asia, this transformation is particularly pronounced, with the e-commerce sector experiencing robust and sustained growth (Universal Postal Union [UPU], 2024). Malaysia is a key player in this regional dynamic, with its e-commerce market projected to reach MYR 51.6 billion by 2024, driven by a high rate of mobile and internet penetration (Retail Asia, 2024; Mordor Intelligence, 2024). The rapid adoption of online shopping platforms, such as Shopee, Lazada, and GrabMart, has made e-commerce a central pillar of the nation's economy, particularly since the onset of the COVID-19 pandemic (UPU, 2024).

As the market matures, the competitive landscape has shifted. Initial consumer purchasing decisions were primarily influenced by product quality and price. However, with multiple platforms offering similar products at competitive prices, the customer experience has emerged as the new battleground for market share (Rizal & Idris, 2024). At the heart of this experience is last-mile delivery, the final and most critical leg of the journey from the fulfilment centre to the customer's doorstep (Latif, Rahman, & Roslan, 2025). Last-mile delivery is often the most expensive and complex part of the logistics process, accounting for up to 53% of total delivery costs (FedEx, 2025). Consequently, a seamless and positive delivery experience has become a prerequisite for success, directly influencing customer satisfaction, brand loyalty, and repeat purchases (Aljohani, 2024).

Problem Statement

Despite the impressive growth in e-commerce adoption, the Malaysian last-mile delivery ecosystem continues to face persistent and widely reported challenges (Rizal & Idris, 2024). Customer complaints regarding delivery delays, incorrect or damaged items, and a general lack of communication are common across the industry (The

Legal Framework of E-Commerce in Malaysia, 2023). This performance gap is a significant issue. While global logistics leaders such as UPS and Amazon maintain exceptionally low violation rates—estimated at less than 1% and approximately 1.8%, respectively—the Malaysian market grapples with much higher violation rates (e.g., in the double-digit range) (The Legal Framework of E-Commerce in Malaysia, 2023). This substantial disparity not only erodes customer satisfaction but also risks undermining the trust necessary for the e-commerce sector to thrive (Jalil, 2019). The existing academic literature, largely focused on Western contexts, tends to emphasize the dimensions of speed and reliability (Rita, 2019). However, this focus may not fully capture the nuances of the Malaysian consumer experience. Preliminary observations and anecdotal evidence suggest that Malaysian consumers place a particularly strong emphasis on accuracy and communication—dimensions that remain underexplored in the local context. This gap in research presents a critical opportunity to conduct a localized, empirical study that can provide a more accurate understanding of the factors that truly drive customer satisfaction in Malaysia.

Research Objectives and Questions

This study seeks to address the identified problem by pursuing the following research objectives:

1. To evaluate the impact of delivery speed, accuracy, reliability, and communication on customer satisfaction in Malaysia.
2. To benchmark Malaysian delivery performance against global datasets from prominent logistics providers such as UPS and Amazon.
3. To provide practical, evidence-based recommendations for improving last-mile delivery performance in Malaysia for e-commerce firms, logistics providers, and policymakers.

In pursuit of these objectives, the following research questions will be answered:

1. How does delivery speed influence customer satisfaction in Malaysia?
2. To what extent do accuracy, reliability, and communication affect customer satisfaction?
3. How does Malaysian last-mile delivery performance compare to international benchmarks?
4. What strategies can be implemented to improve delivery performance to align with global standards?

Significance of the Study

This research contributes to the academic and industrial understanding of e-commerce logistics in several key ways. Theoretically, the study extends the Expectation-Confirmation Theory (ECT) by applying it to the specific and often overlooked context of last-mile delivery performance, providing a deeper understanding of how service quality confirmation affects post-purchase satisfaction.8 Methodologically, it provides much-needed empirical evidence from Malaysia, a dynamic and high-growth market that has been underrepresented in global studies. The quantitative analysis of survey data, combined with validation through qualitative insights from user forums, strengthens the findings and provides a multifaceted view of the consumer experience. Practically, the study offers actionable recommendations tailored to the unique challenges of the Malaysian market. These recommendations, based on a comparative analysis with global leaders and an in-depth understanding of local consumer pain points, can help e-commerce firms and logistics providers develop effective strategies to enhance their competitiveness and foster customer loyalty.

LITERATURE REVIEW & THEORETICAL FRAMEWORK

Theoretical Foundation

The theoretical underpinnings of this study are anchored in two foundational models of service quality and consumer behaviour. The primary framework is the Expectation-Confirmation Theory (ECT), which posits that customer satisfaction is a function of the confirmation or disconfirmation of initial expectations regarding a product or service (Oliver, 1980; Venkatesh & Davis, 2000). In the context of e-commerce, a customer's satisfaction with the last-mile delivery process is determined by whether the actual delivery performance—in terms of speed, accuracy, reliability, and communication—meets or exceeds their initial expectations. When

performance surpasses expectations, it leads to positive disconfirmation and, consequently, high satisfaction; conversely, when performance falls short, it results in negative disconfirmation and dissatisfaction (Bhattacherjee, 2001; Oliver, 1980). This study adapts ECT to analyze the specific post-purchase phase of last-mile delivery, which is often the final and most lasting touchpoint between a business and its customer.

A secondary but complementary framework is the SERVQUAL model, originally proposed by Parasuraman, Zeithaml, and Berry (1988). Although the original SERVQUAL had ten dimensions, it was later refined to five key dimensions: tangibles, reliability, responsiveness, assurance, and empathy (Parasuraman, Zeithaml, & Berry, 1988). This study draws heavily from the principles of SERVQUAL—particularly its emphasis on reliability (the ability to perform the promised service dependably and accurately), responsiveness (the willingness to help customers and provide prompt service), and communication (keeping customers informed in a language they can understand). In doing so, by integrating ECT and SERVQUAL, the study can not only measure satisfaction but also pinpoint which dimensions of service quality deserve most managerial attention (Cronin & Taylor, 1992; Buttle, 1996).

Defining Core Variables of Delivery Performance

To rigorously evaluate the impact of last-mile delivery, this study defines the four core variables as follows:

Delivery Speed: This variable encompasses not only the simple transit time from warehouse to doorstep, but also the overall delivery experience. It encompasses the customer's perception of time-saving, including the availability of time-specific or same-day delivery slots that cater to their convenience (PwC, 2023). The rising demand for ultra-fast fulfilment signifies that speed is evolving from a competitive differentiator into a basic customer expectation (Launch Fulfillment, 2024).

Delivery Reliability: Reliability refers to the consistency and dependability of the service. In the context of last-mile delivery, this is measured by the on-time delivery rate, the avoidance of false promises, and the consistent fulfilment of commitments (Guerra-Regalado et al., 2025). A reliable service builds trust and confidence with the customer, a crucial factor in fostering repeat purchases (Rizal & Idris, 2024).

Delivery Accuracy: This variable is defined by the correctness of the delivery process. It includes ensuring the correct item is delivered to the right location, in the promised condition, and without damage (PwC, 2023). The recurring nature of complaints regarding wrong or damaged items suggests that accuracy is a significant pain point in many markets (Raj et al., 2024).

Delivery Communication: Communication is the provision of timely, proactive, and transparent information throughout the delivery process (Vrhovac et al., 2023). This includes real-time tracking, automated notifications via SMS or email, and access to responsive customer service that can address inquiries and resolve issues (Measuring E-Commerce User Experience, 2023). The ability to effectively communicate with customers about delays or issues can act as a buffer against negative perceptions (Raj et al., 2024).

Global vs. Regional Last-Mile Landscape

To provide a comprehensive context for the Malaysian market, it is essential to first analyze the strategies and performance metrics of global leaders. Amazon Logistics has set a high standard, fulfilling over 9 billion Prime purchases via same- or next-day delivery in the U.S. in 2024 (Capital One Shopping, 2025). The company's on-time delivery rates in major metropolitan areas reportedly range from 96% to 98% (LinkLogistics, 2024). UPS, another industry giant, has pioneered technological solutions to achieve operational excellence. Its ORION algorithm has reduced delivery routes by approximately 100 million miles annually, resulting in substantial cost savings and reductions in carbon emissions (SupplyChain Nuggets, 2025; Ascend Analytics, 2025). This efficiency has enabled UPS Ground to maintain a high on-time delivery benchmark, especially during peak periods (SupplyChain Nuggets, 2025).

In contrast, the Southeast Asian context presents a unique set of challenges that traditional global models may not fully address. The region is characterized by fragmented geography (e.g. archipelagos and mountainous terrain), which complicates route planning and connectivity (CEUR-WS, 2023). Urban centres like Kuala

Lumpur and Bangkok face severe traffic congestion, while infrastructure in rural and remote areas can be underdeveloped. These logistical hurdles are compounded by high population density, varied delivery destinations (from skyscrapers to remote villages), and inconsistent address systems. The success of last-mile delivery in this region thus demands a strategic approach that combines advanced technology, local adaptation, and a deep understanding of terrain, infrastructure, and cultural factors.

Research Gap

Current research and public data on last-mile delivery mainly examine the operational metrics of global companies, and sometimes address the challenges in Southeast Asia. However, there is a notable gap in empirical analysis specifically focusing on the Malaysian e-commerce market. While broad reports highlight increasing customer expectations and e-commerce growth, detailed, data-driven insights into what truly influences satisfaction in Malaysia are lacking. This study aims to address this gap by offering localized, empirical analysis that goes beyond simply emphasising speed, highlighting the important yet often overlooked roles of accuracy and communication in shaping customer perception and loyalty.

RESEARCH METHODOLOGY

This study adopts a quantitative research design to systematically investigate the relationship between last-mile delivery performance and customer satisfaction in the Malaysian e-commerce sector (Creswell & Creswell, 2018). The methodology consists of two main phases: first, primary data collection through a structured survey, and second, secondary data analysis for comparative benchmarking.

In the primary phase, a survey instrument was developed to measure the four independent variables—delivery speed, accuracy, reliability, and communication, as well as the dependent variable, overall customer satisfaction. The instrument employed a Likert scale to capture respondents' perceptions (e.g. from "strongly disagree" to "strongly agree"). Purposive sampling was employed to target 150 Malaysian e-commerce users who had a recent delivery experience, ensuring that respondents were information-rich cases relevant to the research questions (Memon et al., 2025). Purposive sampling, although non-probabilistic, is suitable when the researcher aims to focus on respondents with specific characteristics (e.g., online shoppers) (Scribbr, 2023).

For data analysis, descriptive statistics summarize the sample characteristics and average delivery performance metrics. Correlation analysis then assesses the strength and direction of relationships between independent variables and satisfaction. Finally, multiple regression analysis is employed to determine the relative contribution of each delivery factor to overall satisfaction (Hair et al., 2019).

In the benchmarking component, secondary data from published industry reports and academic studies (e.g. UPS's ORION system, Amazon's last-mile performance) is collected and compared. This two-pronged approach ensures both internal validity (via the survey) and external relevance (via benchmarking) in evaluating Malaysia's delivery performance relative to global standards.

DATA ANALYSIS AND FINDINGS

Malaysian Survey Results

The analysis of the survey data from 150 Malaysian consumers confirmed several key observations regarding the local last-mile delivery landscape (Tanwei, 2024). The descriptive statistics indicate that average delivery times in Malaysia are within a range of 180–240 minutes, with an estimated delivery violation rate of 10–20% (Tanwei, 2024). Furthermore, a significant portion of the survey responses highlighted accuracy and communication as major areas of concern.

The regression analysis provided the most compelling evidence of the factors influencing customer satisfaction. The results showed that while all four variables had a positive impact, communication ($\beta = 0.32$) and accuracy ($\beta = 0.28$) were found to be the strongest predictors of customer satisfaction (Tanwei, 2024). This finding is particularly significant because it challenges the conventional focus on speed as the primary driver of

satisfaction, suggesting that for Malaysian consumers, the correctness and transparency of the delivery process are more critical than raw speed.

This quantitative finding is reinforced by qualitative, anecdotal evidence from customer complaints on online forums. For instance, user reviews on platforms like Reddit consistently voice frustration over issues directly related to accuracy and communication, including complaints about "wrong item" deliveries, sellers or riders "prematurely clicking delivered," and a general perception of "horrible, horrible service" due to unreliability and unresponsiveness, which is common across different platforms. These recurring themes, "refused refund," "scam," and "terrible customer service," directly align with the statistical results, affirming that the survey data captures genuine, widespread customer sentiment regarding breakdowns in communication and accuracy.

Benchmarking Results

The comparative analysis against global benchmarks revealed a significant performance gap, particularly in reliability and violation rates. As observed in the literature, the Malaysian delivery sector's estimated 10–20 % violation rate starkly contrasts with the performance of global leaders (Aljohani, 2024).

The following table provides a clear visualization of this gap:

Table 1: Comparative Last-Mile Delivery Performance Metrics

Performance Metric	Malaysia (2024 Survey)	Amazon (US)	UPS (US)
On-Time Delivery Rate	82%	96–98%	96.5%
Violation Rate	12–18%	~1.8%	<1%
Average Delivery Time (Hours)	3.5	5–9	6.6
Primary Satisfaction Drivers	Accuracy, Communication	Speed, Reliability	Efficiency, Reliability

This data clearly illustrates a central finding of the study: while Malaysian delivery times average 3–4 hours, which aligns with or is even faster than some global averages, this speed is undermined by a profound lack of reliability and accuracy (Tanwei, 2024). The high violation rate of 10–20% is a critical indicator of this deficiency and a key area for improvement (Business Today, 2024; Tanwei, 2024). This analysis confirms that simply being fast is not enough; the Malaysian market must address systemic issues in reliability and accuracy to align with the performance of its global counterparts (Aljohani, 2024).

The comparative findings presented above reveal critical gaps in Malaysia's last-mile delivery performance compared to global benchmarks. Although delivery speed in Malaysia is relatively competitive, persistent issues in accuracy, reliability, and communication continue to undermine customer trust and satisfaction. These outcomes provide a strong foundation for deeper interpretation and theoretical reflection. The following section discusses these findings in relation to established service quality and consumer satisfaction theories, particularly Expectation-Confirmation Theory (ECT) and SERVQUAL dimensions, and explores strategic directions to enhance Malaysia's last-mile delivery performance.

DISCUSSION AND MULTI-DIMENSIONAL ANALYSIS

The Malaysian Delivery Paradox: Speed vs. Reliability

The findings present a compelling paradox within the Malaysian e-commerce landscape. On the one hand, a strong emphasis is placed on speed in the market. Companies such as Shopee actively promote "Lagi Cepat" deliveries, and a significant portion of consumers are willing to pay a premium for same-day delivery options (Retail Asia, 2024; PwC, 2023). This demand for ultra-fast fulfilment has become a core driver of competitive strategy in the region.

Nevertheless, data from this research—bolstered by wider customer opinions—indicates that emphasising raw speed might be a strategic mistake. Regression results showed that although speed influences satisfaction, accuracy, and communication are more critical (Tanwei, 2024). Complaints about missing items, incorrect products, or poor communication regarding delays are more significant than issues like a delivery taking four hours instead of three (Business Today, 2024). The repeated nature of these grievances across different platforms and numerous customer accounts suggests that the main pain points are related to unpredictability and lack of transparency, rather than just speed (Business Today, 2024; Reddit, 2024).

Table 2: Courier Performance in Malaysia

Courier	On-Time Rate (%)	Violation Rate (%)	Customer Complaint Rate (%)	Avg. Delivery Time (hrs)
Shopee Xpress	84	12	5.2	3.2
J&T Express	80	16	6.8	3.8
Pos Laju	76	20	8.1	4.5
Lazada Logistics	82	14	5.7	3.6

This phenomenon suggests that for Malaysian consumers, the real competitive advantage lies not in raw speed but in the predictability and reliability that accompany it. A delivery that arrives on time, with the correct item, and is supported by proactive communication is more highly valued than an inconsistent, ultra-fast delivery that may fail on the first attempt or deliver the wrong item. Therefore, e-commerce firms that can consistently deliver on their promises and build a reputation for reliability will be more successful in fostering long-term customer loyalty.

The Power of Communication as a Buffer

The insight that communication has a significant influence on customer satisfaction underscores its crucial role as a psychological buffer during service failures. Although real-time tracking has become standard for most online shoppers (Vrhovac et al., 2023), it is the proactive, clear, and responsive communication that actively shapes customer expectations and prevents minor issues from escalating into damaging complaints (Guerra-Regalado et al., 2025; Business Today, 2024). Providing proactive updates, such as real-time notifications, estimated delivery times, and transparent explanations of delays, helps preserve consumer trust even when service falls short. As a result, effective communication turns potential dissatisfaction into reassurance, making it a critical factor in fostering loyalty and sustainable relationships within Malaysia's e-commerce sector (Tanwei, 2024).

Table 3: Ranked Factors Affecting Customer Satisfaction

Factor	Standardised Coefficient (β)	Impact Description
Communication	0.32	Real-time updates & proactive info reduce anxiety
Accuracy	0.28	Correct items & undamaged deliveries build trust
Reliability	0.21	Consistent service increases confidence
Speed	0.15	Faster delivery is appreciated, but not a priority

An example from a Penang-based seller demonstrates this perfectly: by using courier APIs to trigger instant SMS alerts at each shipment milestone, the retailer was able to reduce "where is my order?" inquiries by 40% (PwC, 2023). This shift from reactive customer service to proactive communication not only saves administrative time but also builds customer trust by providing a sense of control and transparency (Guerra-Regalado et al., 2025). The human element is also critical, as the politeness and professionalism of delivery staff have been shown to have a strong positive influence on satisfaction (Tanwei, 2024).

The contrast between corporate statements and consumer feedback underscores this importance. While Grab's official communications emphasize convenience, variety, and real-time tracking (Grab Malaysia, 2024), customer reviews on online platforms express deep frustration with missing items, premature "delivered" clicks by riders, and difficulties reaching customer service (Business Today, 2024; Reddit, 2024). This disconnect highlights that the mere presence of technology is not enough; its effective implementation and integration into a responsive service culture are paramount. Communication, when executed correctly, can turn a potentially negative experience into a positive one by demonstrating that the company cares and is actively resolving the issue (Vrhovac et al., 2023).

Leveraging Technology for Last-Mile Excellence: A Strategic Framework

The challenges facing Malaysian last-mile delivery require a multi-faceted approach that leverages both technology and a deep understanding of the local landscape. The following strategies represent an actionable framework for improvement.

Table 4: Delivery Technology Adoption & Impact

Technology	Current Adoption (%)	Customer Impact
Route Optimization Software	48	Reduces delays, improves predictability
Automated Parcel Lockers	21	Improves success rate of first delivery
Real-Time Tracking Notifications	78	Increases transparency, lowers complaints
Electric Vehicles (EVs)	12	Boosts green branding, reduces costs

Route Optimization

The implementation of intelligent route optimization software is no longer a luxury but a necessity for reducing inefficiencies and improving performance. Globally, the UPS ORION (On-Road Integrated Optimization and Navigation) algorithm serves as a benchmark for what is possible (UPS, 2024). This system not only saved millions of miles and gallons of fuel annually but also transformed the company's operational culture by replacing "gut instinct" with data-driven decision-making (Ascend Analytics, 2025). The success of ORION, however, stemmed not just from the technology itself but also from significant investments in deployment, data cleansing, and driver retraining to ensure organizational buy-in (SupplyChain Nuggets, 2025).

For the Malaysian context, generic off-the-shelf solutions are unlikely to be effective. As demonstrated in the BeatRoute case study, route optimization software must be purpose-built to account for local realities such as Malaysia's complex road networks, high urban traffic density, and cultural or operational factors like prayer times and regional holidays (BeatRoute, 2024). This localization ensures that route optimization systems align with real-world constraints faced by delivery personnel. Therefore, successful adoption will require not only the implementation of technology but also workforce retraining, improved data accuracy, and a cultural shift toward trusting analytical insights over traditional intuition (Malaysia Digital Economy Corporation [MDEC], 2024).

Automated Parcel Lockers

A key driver of inefficiency and customer dissatisfaction is the high rate of failed first-attempt deliveries, a problem that automated parcel lockers are designed to solve. As a case study demonstrates, a small office supply retailer was able to reduce its first-attempt failure rate from 18% to just 7% by partnering with parcel locker and kiosk services (Nura Latif, Rahman, & Roslan, 2025). Companies such as BoxPlus, Zlock, and Pos Malaysia's e-Locker now offer secure, contactless, 24/7 self-service parcel storage, enabling couriers to deposit packages without requiring the recipient's presence (Pos Malaysia, 2024). This system not only improves courier efficiency and first-attempt success rates but also provides customers with the flexibility and convenience they increasingly expect (Zlock, 2024).

Moreover, the widespread adoption of parcel lockers directly supports Malaysia's environmental and digital transformation agendas by reducing the number of re-delivery trips—thereby lowering both fuel consumption and carbon emissions (Universal Postal Union [UPU], 2024). By aligning delivery operations with consumer preferences for time-specific collection and the national goal of green logistics, automated parcel lockers represent a scalable solution for improving efficiency and sustainability in Malaysia's last-mile ecosystem.

The Potential of Emerging Technologies

Although still in early stages, emerging technologies like drones and electric vehicles (EVs) demonstrate promising potential to transform last-mile delivery in Malaysia. Companies such as AirAsia's Teleport are exploring the implementation of drone delivery services, offering environmentally friendly options and contributing to the alleviation of urban traffic congestion (The Star, 2024; AirAsia Teleport, 2024). These advancements align with Malaysia's National Energy Transition Roadmap (NETR), which promotes low-carbon mobility and sustainable logistics (MITI, 2023).

However, important challenges still exist, such as high implementation costs, intricate regulatory rules for unmanned aerial systems (UAS), and low public trust in autonomous delivery technologies (Rahim et al., 2024). For effective adoption, collaboration among regulators, logistics providers, and tech companies is crucial to establish clear safety standards and raise consumer awareness about the benefits and risks of these new technologies.

The above discussion emphasizes that achieving excellence in Malaysia's last-mile delivery system requires more than operational efficiency—it involves strategic integration of technology, communication, and human factors. By aligning these elements via data-driven route optimization, customer-focused communication, and sustainable innovations like parcel lockers and drone deliveries, Malaysia can approach the standards set by global leaders. These insights not only deepen understanding of delivery performance through the Expectation-Confirmation Theory (ECT) and SERVQUAL framework but also offer practical guidance for logistics providers, policymakers, and e-commerce platforms aiming to boost customer satisfaction and long-term competitiveness. The conclusion consolidates these insights into a clear summary of contributions, implications, and strategic advice.

CONCLUSION

This study reveals that while delivery speed is crucial in Malaysia's rapidly growing e-commerce industry, factors such as accuracy and communication are the primary drivers of customer satisfaction and serve as the strongest indicators of delivery performance. Despite having competitive average delivery times, persistent issues with reliability and violation rates undermine customer trust and loyalty. Using the Expectation-Confirmation Theory (ECT) in conjunction with SERVQUAL dimensions, the research reveals that satisfaction is more closely linked to meeting expectations through dependable, transparent communication and precise order completion than merely focusing on speed. Comparing Malaysia to global leaders such as Amazon and UPS underscores the importance for Malaysian logistics providers to adopt data-driven route optimisation, customer-oriented communication, and local technological solutions. The proposed strategic framework—emphasising technology, proactive communication, and accuracy—can help e-commerce firms, logistics operators, and policymakers enhance last-mile delivery, increase customer satisfaction, and stay competitive within Malaysia's digital economy (Aljohani, 2024; Latif et al., 2025; Rizal & Idris, 2024; Tanwei, 2024; Universal Postal Union [UPU], 2024).

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