Factor affecting logistic and delivery in e-business in Nepal

Sanjip Chaudhary*

Abstract

This study examines the factor affecting logistic and delivery in e-business in Nepal. Customer satisfaction in logistic and delivery in e-business in Nepal is the dependable variable. The independent variables are geographical terrain, road Infrastructure, weather condition, government police, financial resource, customer expectation, health and safety regulation, and digital infrastructure. The primary source of data is used to assess the opinions of the respondents regarding the factors affecting logistic and delivery in e-business in Nepal. The study is based on primary data of 122 respondents. To achieve the purpose of the study, structured questionnaire is prepared. The correlation coefficients and regression models are estimated to test the different factors affecting logistic and delivery in e-business in Nepal.

The result shows that geographical terrain has a positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that improve in geographical terrain leads to improve in customer satisfaction in logistic and delivery in e-business. Similarly, road infrastructure has appositive impact on customer satisfaction in logistic and delivery in e-business. It shows that better road infrastructure leads to higher customer satisfaction in logistic and delivery in e-business. Likewise, weather conditions has a positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that better weather condition leads to higher customer satisfaction in logistic and delivery in e-business. Further, government police has a positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that better government policies leads better customer satisfaction in logistic and delivery in e-business. Moreover, financial resources has a positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that better financial resources leads to higher customer satisfaction in logistic and delivery in e-business. Furthermore, customer expectation has appositive impact on customer satisfaction in logistic and delivery in e-business. It shows that higher customer expectation leads to higher customer satisfaction in logistic and delivery in e-business. In addition, health and safety regulation has a positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that better health and safety regulation leads to higher customer satisfaction in logistic and delivery in e-business. Additionally, digital infrastructure has also positive impact on customer satisfaction in logistic and delivery in e-business. It indicates that better digital infrastructure leads to higher customer satisfaction in logistic and delivery in e-business.

Keywords: customer's satisfaction in logistic and delivery, geographical terrain, road infrastructure, weather condition, government police, customer expectation, health and safety regulation, digital infrastructure

1. Introduction

Logistics and delivery are critical components of e-business, serving as the backbone of supply chain management and ensuring the efficient movement of goods from suppliers to customers. Mentzer (2001) defined logistics as the process of planning, implementing, and controlling the efficient flow and storage of goods, services, and information from the point of origin to the point of consumption, emphasizing its importance in meeting customer requirements. Langley and Holcomb (1992) emphasized logistics as a key enabler of customer satisfaction, especially in the e-business sector, where timely and accurate delivery is critical. Similarly, Lemoine and Skjoett-Larsen (2004) found logistics as the backbone of the e-commerce supply chain, asserting that adaptable logistics systems are essential for addressing infrastructure challenges in regions such as Nepal. Likewise, Hesse and Rodrigue (2004) described logistics as the spatial and functional integration of supply chain activities, emphasizing its importance in managing the geographical challenges often encountered in

* Mr. Chaudhary is a Freelance Researcher, Kathmandu, Nepal.

e-business, particularly in developing countries.

Matopoulos *et al.* (2009) analyzed that the factors affecting e-business adoption and its impact on logistics processes. The study found that e-business adoption significantly influences logistics processes, primarily through cycle time reductions and quality improvements rather than direct cost reductions. The study also highlighted that increased operational compatibility and enhanced levels of collaboration drive the adoption and impact of e-business. Similarly, Bhatti *et al.* (2022) investigated that the impact of e-procurement, e-fulfillment, and e-logistics on Saudi SMEs' performance: Mediating role of e-supply chain performance and moderating role of reverse logistics and return. The study stated that the emergence of Internet and technology has revamped the logistics services and improved efficiency of businesses. Likewise, Gupta *et al.* (2021) investigated that the delivery issues that customers face upon e-commerce shopping. The found that four major factors influence the delivery issues faced by customers in e-commerce shopping. The study also revealed that failures in the delivery process, such as delays, incorrect deliveries, and poor customer service, significantly contribute to customer dissatisfaction and hinder customer retention. Further, Tripathi *et al.* (2024) assessed that the marketing logistics and consumer behavior: An empirical study on Indian e-shoppers. The study stated that, except for product availability, marketing logistics (ML) dimensions such as product quality, tracking facility, and delivery speed significantly influence customer satisfaction (CS) among Indian e-shoppers. The study also revealed that higher customer satisfaction leads to increased customer loyalty, re-purchase intentions, and positive word-of-mouth. In addition, Hye *et al*. (2020) found that blockchain adoption significantly impacts IT capacity, staff service quality, and e-logistics, leading to enhanced logistics supply chain performance (LSCP).

Adeniran *et al.* (2022) examined that the factors influencing the acceptance and patronage of e-commerce logistics operations in Nigeria. The study revealed that the several factors influence the acceptance and patronage of e-commerce logistics operations in Nigeria. The study also showed that the reputation and dual focus on e-commerce and logistics by businesses such as Jumia, Konga, and others were critical in driving acceptance and patronage. Similarly, Giuffrida *et al.* (2020) investigated that the cross-border B2C e-commerce to China: An evaluation of different logistics solutions under uncertainty. The study found that companies' risk-informed selection of a logistics solution to operate in China via Cross Border B2C E-Commerce (CBEC). Likewise, Gorokhova *et al*. (2020) investigated the impact of e-commerce development on logistic service in Ukraine: Perspectives and challenges. The study identified that the priority areas of using certain types of logistics services in the world and in Ukraine are identified. Further, Kumar and Singh (2022) studied that geographical terrain and its negative impact on customer satisfaction in logistics and delivery in e-business. The study found that Geographical Terrain significant negative impact on customer satisfaction in logistics and delivery in E-business including delivery time, cost efficiency, and customer satisfaction. Moreover, Kuo *et al*. (2023) analyzed that the environmental benefits of improving road infrastructure in logistics operations. The study highlighted that the road infrastructure improvements are a key component in reducing the environmental impact of logistics operations. Additionally, Rutner and Langley (2000) the logistics value chain is a concept integrated by the meaning of logistics value and value-added in the chain

Appelqvist *et al.* (2016) examined that the effects of seasonal temperature variations on order volumes and supply chain performance. The found that increase in temperature in

winter and spring decreases order volumes in resorts, while for larger customers in urban locations order volumes increase. Further, an increase in volumes of non-seasonal products reduces delays in deliveries, but for seasonal products the effect is opposite. Similarly, Zhou *et al.* (2019) explored the broader environmental impact of terrain in relation to climate change. The study pointed out that different terrains are impacted differently by climatic changes such as temperature fluctuations, rainfall patterns, and extreme weather events, which can, in turn, influence agricultural and economic activities. Likewise, Zhang *et al.* (2021) analyzed that the seasonal variations in road conditions and their impact on e-commerce logistics performance. The study stated that the seasonal variation in road conditions significantly impacts e-commerce logistics, with disruptions in road networks leading to delayed deliveries and lower customer satisfaction. The study also argued that improving road infrastructure, especially in rural and remote areas, is essential for reducing delivery times and enhancing the reliability of e-commerce logistics services. Further, Chang and Lai (2017) studied that the government policies as enablers of logistics efficiency: A case study of Taiwanese logistics firms. The study argued that the government police or logistics policy enablers according to Taiwanese logistics firms are information technology system, inland transport linkage, simplifying the customs clearance procedures, ports and maritime transport and having a policy to ensure efficient service operation and multiplicity of services. Moreover, Javed and Wu (2020) assessed that the road infrastructure and its positive impact on e-commerce logistics service quality and customer satisfaction. The study found that road Infrastructure has positive impact on E-commerce logistics service quality factors affecting customer satisfaction.

In the context of Nepal, Shrestha (2010) analyzed that the logistics in Nepal: Challenges and opportunities. The study stated that poor road networks and inadequate transportation facilities are significant barriers to efficient logistics in Nepal, particularly in rural areas. Similarly, Karki and Poudel (2013) examined that the impact of infrastructure on logistics in Nepal. The study argued that the lack of proper warehousing and storage facilities increases the cost of delivery and risks of damage to goods. Likewise, Rana and Thapa (2014) studied that the challenges of last-mile delivery in Nepal. The study found that Nepal's mountainous terrain and remote settlements make last-mile delivery particularly challenging, impacting delivery timelines and cost. Further, Gautam (2015) investigated that the importance of logistics in the e-business supply chain. The study demonstrated that seasonal issues, like monsoons and landslides, further disrupt logistics operations, especially in hilly and Himalayan regions. Moreover, Poudel and Bista (2017) found e-business logistics in Nepal suffer from a lack of integration with advanced tracking systems and automated warehouse management. This limits efficiency and transparency. In addition, Bhandari (2018) found the low adoption of GPS and route optimization tools among small and medium enterprises hinders operational improvements. However, Giri and Paudel (2017) found limited awareness of logistics services among consumers leads to unrealistic expectations and dissatisfaction with delivery timelines.

Joshi and Pandey (2016) analyzed that challenges in e-business logistics in Nepal. The study noted that Nepal lacks clear regulatory frameworks for e-commerce and logistics, leading to issues in customs clearance, taxation, and legal compliance. Similarly, Karki and Sharma (2019) evaluated that the environmental sustainability in logistics: The case of Nepal. The study argued that the environmental sustainability is becoming a concern, with increasing focus on adopting eco-friendly practices like electric vehicles and reusable packaging in

logistics. Likewise, Tamang and Gurung (2019) found skilled manpower for logistics and delivery management is scarce, with a high reliance on untrained personnel. Further, Dahal and Shrestha (2021) found urban centers like Kathmandu, Pokhara, and Lalitpur offer better logistics networks, while rural areas face significant delivery challenges due to dispersed populations. Moreover, Kharel (2015) increasing consumer demand for faster delivery times puts pressure on logistics providers to adopt more efficient methods. In addition, Bhattarai and Adhikari (2020) examined that the role of third-party logistics providers in Nepal. The study stated that many e-businesses in Nepal collaborate with third-party logistics providers, but the lack of coordination and quality assurance remains a critical issue. However, Acharya and Basnet (2020) found that the stringent import regulations and frequent policy changes cause delays in procurement and delivery.

The above discussion reveals that the empirical evidences vary greatly across the studies concerning the factors that affect logistic and delivery in e-business. Though there are above mentioned empirical evidences in the context of other countries and in Nepal, no such findings using more recent data exist in the context of Nepal. Therefore, in order to support one view or the other, this study has been conducted.

The main purpose of the study to analyze the factor affecting logistic and delivery in e-business in Nepal. Specifically, it examines the effect of geographical terrain, road infrastructure, weather conditions, government police, financial resources, customer, expectation, digital infrastructure and health and safety regulation on customer satisfactions in logistic and delivery in e-business in Nepal.

The remainder of this study is organized as follows. Section two describes the sample, data and methodology. Section three presents the empirical results and the final section draws the conclusion.

2. Methodological aspects

The study is based on primary sources of data which were gathered from 7 different province of Nepal. For primary data a structured questionnaire was used. This study contains a sample of 7 province of Nepal whose respective data are collected from a total of 122 respondents. The respondents' views were collected on geographical terrain, road infrastructure, weather condition, government police, financial resources, customer expectation, health and safety regulation, digital infrastructure and customer's satisfaction in logistic and delivery in e-business. This study is based on descriptive as well as casual comparative research designs.

The model

The model used in this study assumes that customer customer's satisfaction in logistic and delivery in e-business depends upon the various factors. The dependent variable selected for the study is customer's satisfaction in logistic and delivery in e-business. Similarly, the independent variables are geographical terrain, road infrastructure, weather condition, government police, financial resources, customer expectation, health and safety regulation, digital infrastructure. Therefore, the model estimated in this study is stated as follows:

$$CSILADIEN = \beta_0 + \beta_1(GT) + \beta_2(RT) + \beta_3(WC) + \beta_4(GP) + \beta_5(FR) + \beta_6(CE) + \beta_7(HSR) + \beta_8(DI) + e$$

Where,

GT= Geographical terrain

RI= Road infrastructure

WC = Weather conditions

GP =Government police

FR= Financial resources

CE= Customer expectation

HSR= Health and safety regulation

DI= Digital infrastructure

CSILADIEN= Customers satisfaction in logistic and delivery in e-business

Customers satisfaction in logistic and delivery in e-business was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The level of customer satisfaction depends on the efficiency of logistics and delivery services", "Financial resources are crucial for expanding and sustaining logistics networks" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.961$).

Geographical terrain was measured using a 5-point Likert scale where respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Delivery companies face delays due to difficult terrain in rural areas", "E-businesses often struggle to provide services in remote areas due to difficult terrain" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.955$).

Road infrastructure was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items "poor road infrastructure negatively affects delivery speed in e-business ", "Investment in road infrastructure would improve delivery performance" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.937$).

Weather Condition were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Extreme weather conditions disrupt the delivery of goods in certain regions of Nepal","The impact of weather on delivery times is a major concern for customers in e-business" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.959$).

Government Police was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "High taxes and customs duties hinder the growth of e-business delivery services", "Simplifying government policies would enhance the logistics sector" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.947$).

Financial Resource were measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Lack of financial resources affects the ability of e-businesses to expand logistics services","Increasing financial investments in logistics would significantly improve delivery performance" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.943$).

Customer expectation was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Meeting customer expectations is the biggest challenge in e-business logistics", "Customers value secure and safe delivery more than fast delivery" and so on. . The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.947$).

Health and Safety regulations was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "The COVID-19 pandemic has led to improvements in safety protocols for delivery", "Health and safety regulations are adequately followed in the logistics sector of e-business" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.950$).

Digital Infrastructure was measured using a 5-point Likert scale where the respondents were asked to indicate the responses using 1 for strongly disagree and 5 for strongly agree. There are 5 items and sample items include "Poor digital infrastructure in Nepal limits the efficiency of logistics in e-business", "An improved digital infrastructure would lead to better logistics tracking and delivery services" and so on. The reliability of the feature was measured by computing the Cronbach's alpha ($\alpha = 0.953$).

The following section describes the independent variables used in this study along with the hypothesis formulation.

Geographical Terrain

Geographical terrain refers to the physical features and characteristics of the land's surface in a specific area. It encompasses the natural features such as mountains, valleys, rivers, plains, hills, deserts, forests, and other landforms. Husnain *et al.* (2018) defined "Robustness of geography as an instrument to assess impact of climate change on agriculture. The difficult terrain leads to longer delivery times, increased transportation costs, and difficulty in reaching remote customers. Similarly, Kumar and Singh (2022) found that Geographical Terrain significant negative impact on customer satisfaction in logistics and delivery in E-business including delivery time, cost efficiency, and customer satisfaction. The study highlighted the significance of logistics strategies in enhancing e-business operations. Likewise, Chang *et al.* (2021) found that the impact of geographical terrain on agriculture extends beyond physical features to include socio-economic factors such as access to technology and local infrastructure. Further, Singh (2020) found that how technological advancements and geographic information systems (GIS) can help mitigate some of these challenges by providing better route planning and real-time tracking to optimize delivery in challenging environments. Moreover, Zhou *et al.* (2019) pointed out that different terrains are impacted differently by climatic changes such as temperature fluctuations, rainfall patterns, and extreme weather events, which can, in turn, influence agricultural and economic activities.

Based on it, this study develops the following hypothesis:

H_1: There is a positive relationship between geographical terrain and customer satisfaction in logistics and delivery in E-business.

Road Infrastructure

Road infrastructure refers to the network of roads, highways, bridges, tunnels, and other related facilities that enable the efficient movement of people, goods, and services across a region or country. Road infrastructure significantly influences customer satisfaction in logistics and delivery within e-commerce. Efficient road networks facilitate timely deliveries, which are crucial for meeting consumer expectations for fast service. Javed and Wu (2020) found that road Infrastructure has positive impact on E-commerce logistics service quality factors affecting customer satisfaction. Similarly, Liu and Zheng (2022) revealed that road infrastructure have significant and positive association with customer satisfaction indicators in transportation and distribution for online shopping. Likewise, Zhang *et al.* (2021) stated that the seasonal variation in road conditions significantly impacts e-commerce logistics, with disruptions in road networks leading to delayed deliveries and lower customer satisfaction. Furthermore, road infrastructure affects the efficiency of warehouse operations, as poor access roads can lead to increased costs for transporting goods to and from distribution centers (Tao and Li, 2019). In addition, Kuo *et al*. (2023) highlighted that road infrastructure improvements are a key component in reducing the environmental impact of logistics operations. The study suggested that better-quality roads reduce fuel consumption and emissions by facilitating smoother travel and minimizing delays. Based on it, this study develops the following hypothesis:

H_2: There is a positive relationship between road infrastructure and customer satisfaction in logistics and delivery in e-business.Top of Form

Weather Conditions

Weather conditions refer to the state of the atmosphere at a particular location and time, encompassing various elements like temperature, humidity, wind, precipitation, and atmospheric pressure. Kumar (2023) defined the term weather conditions refers to a unreliable, cause frequent delays, and increase operational costs due to route changes and damaged goods during transportation. Similarly, Appelqvist *et al.* (2016) found increase in temperature in winter and spring decreases order volumes in resorts, while for larger customers in urban locations order volumes increase. Likewise, Chen and Yano (2010) explained that weather represents an important determinant of demand for many products. In the retail sector, Wal-Mart Stores Inc. reported in June 2005 that its inventory levels were higher than normal for the second straight quarter as below-normal temperatures crimped demand (Timberlake and Wiles 2005). Based on it, this study develops the following hypothesis:

H_3: There is a positive relationship between weather conditions and customer satisfaction in logistics and delivery in E-business

Government Policies

Government policies are the principles, guidelines, rules, and regulations created by a government to govern the behavior of individuals, organizations, or the economy. These policies are designed to address various societal needs and challenges, such as economic

stability, social welfare, public safety, and environmental protection. Government policies can be enacted at the local, regional, or national level and often reflect the priorities and ideologies of the governing party or institution. According to Chang and Lai (2017), government police or logistics policy enablers according to Taiwanese logistics firms are information technology system, inland transport linkage, simplifying the customs clearance procedures, ports and maritime transport and having a policy to ensure efficient service operation and multiplicity of services. Similarly, Sharma (2023) defined the new logistic policy introduced by the government, the private sector and the government need to re-evaluate their approach to the logistics sector to ensure an effective and supportive institutional environment. According to Chaudhary (2023), the government has established regulations to support third-party logistics (3PL) services, essential for e-commerce growth, ensuring compliance with safety and operational standards. Based on it, this study develops the following hypothesis:

H_4: There is positive relationship between government policies and customer satisfaction in logistics and delivery in e-Business.

Financial Resources

Financial resources refer to the availability and management of funds necessary to operate and grow a company. Financial resources impact how well a firm can invest in technology, infrastructure, and human resources, which are critical in delivering quality services. Firms with strong financial resources are better equipped to implement strategic initiatives, such as expanding logistics capacity or investing in customer relationship management (CRM) systems, leading to operational efficiency (Smith and Jones, 2016). Studies have found that businesses with higher financial reserves are more likely to survive market fluctuations and have a positive impact on profitability (Brown *et al.,* 2018). Proper allocation of financial resources also enhances service reliability, which in turn leads to better customer satisfaction (White and Walker, 2020). Hence, a well-financed company can afford to meet customer expectations and maintain competitiveness in the market. A lack of financial resources limits the ability of e-businesses to invest in better logistics infrastructure, leading to inefficient delivery services and poor customer satisfaction. Based on it, this study develops the following hypothesis:

H_5: There is a positive relationship between Financial Resources and customer satisfaction in logistics and delivery in e-business.

Customer Expectations

Customer expectations refer to the perceived standards that customers hold for service quality, delivery time, and overall business performance. Meeting or exceeding these expectations is crucial for building customer satisfaction and loyalty (Johnson and Clark, 2017). In logistics and delivery, customers expect on-time shipments, transparent tracking, and reliable service, particularly in e-business (Davis *et al.,* 2019). Firms that successfully manage these expectations often experience higher retention rates, positive word-of-mouth, and increased profitability. For instance, studies have shown that businesses that prioritize customer-centric strategies tend to have stronger brand loyalty, which ultimately leads to sustained revenue growth (Miller and Patel, 2018). Businesses that fail to meet customer expectations, however, may experience customer churn and negative brand perception. Consumers expect affordable shipping costs, which forces e-businesses to balance between meeting these expectations and covering their logistic. Based on it, this study develops the

following hypothesis:

H_6: There is positive relationship between customer satisfaction and customer satisfaction in logistics and delivery in E-business.

Digital Infrastructure

Digital infrastructure refers to the foundational technological systems and services that support e-business operations, such as high-speed internet, cloud computing, data centers, and cyber security measures (Smith and Johnson, 2018). In e-business, strong digital infrastructure is crucial for handling online transactions, managing supply chains, and ensuring seamless delivery processes (Williams *et al.,* 2019). A well-developed digital infrastructure allows firms to scale their operations by integrating advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and automation into their logistics and customer service processes. For example, reliable internet connectivity and cloud platforms enable businesses to process orders quickly, update customers on delivery statuses, and streamline communication across departments (Brown and Davis, 2020). Based on it, this study develops the following hypothesis:

H_7: There is positive relationships between Digital infrastructure and customer satisfaction in logistics and delivery in E-commerce.

Health and Safety Regulations

Health and safety regulations refer to government-enforced guidelines that ensure a safe working environment for employees and secure service processes for consumers. In logistics and e-business, these regulations often cover safe handling of goods, secure packaging, and the well-being of delivery personnel (Wilson *et al.,* 2020). Compliance with these regulations not only protects a firm from legal risks but also boosts its reputation for reliability and responsibility. A business that adheres to safety standards can gain customer trust, which positively affects profitability (Adams and Green, 2021). Additionally, ensuring health and safety within a business can reduce operational disruptions, such as accidents or violations, thus allowing smoother logistics operations. Companies that invest in safety regulations often see a return in terms of improved employee satisfaction and customer confidence, which can ultimately enhance profitability (Clark and Liu, 2019). Based on it, this study develops the following hypothesis:

H_8: There is positive relationship between Health and safety regulations and customer satisfaction in logistics and delivery in e-business.

3. Results and discussion

Correlation analysis

On analysis of data, correlation analysis has been undertaken first and for this purpose, Kendall's Tau correlation coefficients along with means and standard deviations have been computed, and the results are presented in Table 1.

Table 1

Kendall's Tau correlation coefficients matrix

This table presents Kendall's Tau coefficients between dependent and independent variables. The correlation

coefficients are based on 122 observations. The dependent variable is CSLDIN (Customer satisfaction in logistic and deliver in e-business in Nepal). The independent variable is GT (Geographical terrain), RI (Road infrastructure), WC (Weather condition), GP (Government polices), FR (Financial resources,) CE (Customer expectation), DI (Digital infrastructure), HSR (Health and safety regulations).

Variables	Mean	S.D.	GT	RI	WC	GP	FR	CE	DI	HSR	CSLDIN
GT	4.051	1.131	**1**								
RI	3.79	1.081	0.583**	1							
WC	3.705	1.096	0.588**	0.558**	1						
GP	3.679	1.159	0.535**	0.570**	0.604**	1					
FR	3.725	1.105	0.617**	0.565**	0.606**	0.759**	1				
CE	3.815	1.130	0.626**	0.570**	0.621**	.0646**	0.729**	1			
DI	3.774	1.141	0.605**	0.558**	0.623**	0.636**	0.683**	0.770**	1		
HSR	3.672	1.09	0.534**	0.562**	0.680**	0.645**	0.654**	0.687**	0.692**	1	
CSLDIN	3.692	1.169	0.568**		0.599**	0.581**	0.590**	0.702**	0.686**	0.700**	1

Note: The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent levels respectively.

Table 1 shows the Kendall's Tau correlation coefficients of dependent and independent variables. The study shows that geographical terrain is positively correlated to customer satisfaction in logistics and delivery in e-business in Nepal. It means that improve in geographical terrain leads to improve in customer satisfaction in logistic and delivery in e-business in Nepal. Similarly, there is a positive relationship between road infrastructure and logistic and delivery in e-business in Nepal. It means that improve in road infrastructure leads to improve in customer satisfaction in logistic and delivery service in e-business in Nepal. Likewise, weather conditions has a positive relationship with customer satisfaction in logistic and delivery in e-business in Nepal. It shows that better weather conditions lead to increase in customer satisfaction in logistic and delivery in e-business in Nepal. Furthermore, there is a positive relationship between government police and logistic and delivery in e-business in Nepal. It indicates that better in government police leads to increase in logistics and delivery in e-business in Nepal. Moreover, financial resources has a positive relationship with customer satisfaction in logistic and delivery in e-business in Nepal. It indicates that increase in financial resources leads to increase in logistic and delivery in e-business in Nepal. In addition, customer expectation has a positive relationship with customer satisfaction in logistic and delivery in e-business in Nepal. It indicates that increase in customer expectation leads to increase in customer satisfaction in logistic and delivery in e-business in Nepal. Similarly, digital infrastructure is positively correlated to customer satisfaction in logistic and delivery in e-business in Nepal. It indicates that increase in digital infrastructure leads to increase in logistic and delivery services in e-business in Nepal. Likewise, there is a positive relationship between health and safety regulation and customer satisfaction in logistic and delivery in e-business in Nepal. It indicates that increase in health and safety regulations leads to increase in customer satisfaction in logistic and delivery in e-business in Nepal.

Regression analysis

Having indicated Kendall's Tau correlation coefficients, the regression analysis has been carried out and the results are presented in Table 2. More specifically, it presents the regression results of geographical terrain, road infrastructure, weather condition, government police, financial resources, customer expectation, health and safety regulation and digital

infrastructure on customer satisfaction in logistic and delivery in e-business in Nepal.

Table 2

Estimated regression results of geographical terrain, road infrastructure, weather condition, government police, customer expectation, financial resources, health and safety regulation and digital infrastructure on customer satisfaction in logistic and delivery in e-business in Nepal.

The results are based on 122 observations using linear regression model. The model is $CSILDN_{it} = \beta_0 + \beta_1 GT + \beta_2 RI + \beta_3 WC + \beta_4 GP + \beta_5 FR + \beta_6 CE + \beta 7 HSR + \beta_8 DI\ e_{it}$ where, the dependent variable is CSLDIN (Customer satisfaction on logistic and delivery in Nepal). The independent variables are GT (Government police), RI (Road infrastructure), WC (Weather condition), GP (Government police), FR (Financial resources) and CE (Customer expectation), HSR (Health and safety regulation), DI (Digital infrastructure).

Models	Intercept	Regression coefficients of								Adj. R_bar^2	SEE	F-value
		GT	RI	WC	GP	FR	CE	HSR	DI			
1	0.588 (2.205)**	0.766 (12.07)**								0.545	0.789	145.788
2	0.749 (2.762)**		0.776 (11.28)**							0.511	0.818	127.321
3	0.698 (2.842)**			0.808 (12.71)**						0.570	0.767	161.585
4	0.998 (4.084)**				0.732 (11.5)**					0.522	0.808	133.358
5	0.822 (3.194)**					0.770 (11.62)**				0.526	0.805	135.162
6	0.317 (1.625)**						0.885 (18.05)**			0.729	0.609	325.960
7	0.415 (2.117)**							0.868 (17.45)**		0.715	0.624	304.723
8	0.474 (2.188)**								0.876 (15.55)**	0.664	0.678	240.403
9	0.291 (1.101)**	0.478 (4.978)**	0.386 (3.846)**							0.592	0.747	88.665
10	0.253 (0.990)**	0.347 (3.407)**	0.153 (1.242)	0.392 (3.086)**						0.619	0.722	66.518
11	0.174 (0.702)**	0.274 (2.708)**	0.081 (0667)	0.295 (2.332)**	0.275 (3.079)**					0.645	0.697	55.844
12	0.164 (0.659)**	0.252 (2.273)*	0.079 (0.653)	0.294 (2.314)**	0.230 (1.877)	0.074 (0.523)				0.642	0.699	44.452
13	0.121 (0.578)**	(0.059) (0.577)	0.087 (0.852)	0.199 (1.847)**	0.147 (1.422)	-0.174 (1.414)	0.748 (7.028)**			0.748	0.588	60.731

Notes:

i. Figures in parenthesis are t-values
ii. The asterisk signs (**) and (*) indicate that the results are significant at one percent and five percent level respectively
iii. Customer satisfaction in logistic and delivery in E-Business in Nepal is the dependent variable

Table 2 shows that the beta coefficients for geographical terrain are positive with the customer satisfaction in logistics and delivery in e-business. It indicates that geographical terrain has a positive impact on the customer satisfaction in logistics and delivery in e-business. This finding is similar to the findings of Husnain et al. (2018). Similarly, the beta coefficients for road infrastructure are also positive with the customer satisfaction on logistics and delivery in e-business. It indicates that road infrastructure has a positive impact on the customer satisfaction in logistics and delivery in e-business. This finding is consistent with the findings of Liu and Zheng (2022). Likewise, the beta coefficients for government policies are positive with the customer satisfaction in logistics and delivery in e-business. It indicates that government policies has a positive on customer satisfaction in logistics and delivery in e-business. This finding is similar to the finding of Chang and Lai (2017). Further, the beta coefficients for the weather conditions are positive with the customer satisfaction in logistics

and delivery in e-business. It indicates that the weather conditions has a positive impacts on the customer satisfaction in logistics and delivery in e-business. This finding is consistent with the findings of Chen and Yano (2010). Moreover, the beta coefficients for financial resources are positive with the customer satisfaction in logistics and delivery in e-business in Nepal. It indicates that financial resources has a positive impact on the customer satisfaction in logistics and delivery in e-business in Nepal. This finding is consistent with the findings of (Smith and Jones, 2016). Furthermore, the beta coefficients for customer expectations are positive with the customer satisfaction in logistics and delivery in e-business in Nepal. It indicates that customers' expectations has a positive impact on the customer satisfaction in logistics and delivery in e-business in Nepal. This finding is consistent with the findings of Johnson and Clark, (2017). In addition, the beta coefficients for the health and safety regulations are positive with the customer satisfaction in logistics and delivery in e-business in Nepal. It indicates that the health and safety regulations has a positive impacts on the customer satisfaction in logistics and delivery in e-business in Nepal. This finding is consistent with the findings of Adams and Green, (2021). However, the beta coefficients for the digital infrastructure are positive with the customer satisfaction in logistics and delivery in e-business. It indicates that the digital infrastructure has a positive impacts on the customer satisfaction in logistics and delivery in e-business. This finding is consistent with the findings of (Smith and Johnson, 2018).

4. Summary and conclusion

Logistics and delivery play a crucial role in e-business, ensuring that products are delivered to customers efficiently, on time, and in good condition. These processes are fundamental for providing a positive customer experience and driving repeat business. In Nepal, the logistics and delivery sectors in e-business are influenced by a range of factors that can either enhance or challenge the efficiency of operations. The logistics and delivery sector for e-businesses in Nepal is shaped by infrastructure limitations, geography, cost factors, and regulatory challenges. To succeed in this environment, businesses must navigate these factors by adopting innovative solutions, optimizing delivery routes, investing in technology, and building strong relationships with local courier services. By addressing these challenges effectively, e-businesses can improve customer satisfaction and operational efficiency. This study provides insightful information regarding factor affecting logistic and delivery in e-business in Nepal. The study analyzes various significant variables that could impact on customer satisfaction in logistic and delivery in e-business. These variables include how geographical terrain, road infrastructure, weather condition, government police, financial resources, customer expectation, health and safety regulation and digital infrastructure influence customer satisfaction in logistic and delivery in e-business in Nepal.

This study attempts to examine the factors affecting logistic and delivery in e-business in Nepal. The study is based on primary data with 122 observations.

The major conclusion of the study is that geographical terrain, road infrastructure, weather condition, government police, financial resources, customer expectation, health and safety regulation and digital infrastructure have positive impact on customer satisfaction in logistic and delivery in e-business in Nepal. The study also concludes that customer expectation is the most significant factor followed by health and safety regulation and digital infrastructure e-commerce market segmentation and privacy and security that influence customer satisfaction in logistic and delivery in e-business in Nepal.

Reference

Acharya, R., and K. Basnet, 2020. Logistics challenges in Nepal's e-business sector. *Journal of Business Logistics* 35(2), 45-60.

Adams, R., and F. Green, 2021. The impact of health and safety compliance on customer trust and profitability in logistics. *Journal of Business Ethics and Logistics 25(3)45-60.*

Adeniran, O. A., O. I. Alabi, and O. A. Ajayi, 2022. Factors influencing the acceptance and patronage of e-commerce logistics operations in Nigeria. *Journal of African Business* 23(1), 52-67.

Appelqvist, P., A. Björkman, and P. Nilsson, 2016. The effects of seasonal temperature variations on order volumes and supply chain performance. *Journal of Retail Logistics 19(*1), 45-55.

Bhandari, N. 2018. The adoption of GPS and route optimization in small enterprises. *Journal of Supply Chain and Logistics* 22(4), 250-265.

Bhattarai, B., and P. Adhikari, 2020. The role of third-party logistics providers in Nepal. *Asian Journal of Business and Logistics* 28(1), 65-80.

Bhatti, A., I. Anwar, K. U. Rehman, M. Saad, and S. Akhtar, 2022. Impact of e-procurement, e-fulfillment, and e-logistics on Saudi SMEs' performance: Mediating role of e-supply chain performance and moderating role of reverse logistics and return. *Journal of Business and Economics* 78(1), 92-100.

Brown, A., and J. Davis, 2020. Leveraging digital infrastructure to enhance customer satisfaction in e-business logistics. *Journal of E-Commerce and Logistics Management 14*(2), 56-69.

Brown, A., P. Taylor, and K. Johnson, 2018. The effect of financial reserves on business resilience and profitability. *Financial Management Journal 42*(1), 78-89.

Chang, T., and W. Lai, 2017. Government policies as enablers of logistics efficiency: A case study of Taiwanese logistics firms. *International Journal of Logistics and Policy 22*(3), 55-65.

Chang, T., S. Li, and Y. Zhang, 2021. Geographical terrain and its socio-economic impacts on agriculture and logistics. *Agricultural Economics and Logistics* 18(2), 105-115.

Chaudhary, S. 2023. Government regulations supporting third-party logistics (3PL) services for e-commerce growth. *Journal of E-commerce and Supply Chain Management 19*(1), 98-110.

Chen, Y., and A. Yano, 2010. The impact of weather on demand forecasting and logistics management. *Operations Research and Logistics 16*(4), 190-200.

Clark, T., and Y. Liu, 2019. The role of safety regulations in reducing operational disruptions and enhancing profitability in logistics. *International Journal of Logistics and Safety Management 14*(2), 78-89.

Dahal, S., and P. Shrestha, 2021. Logistics network challenges in urban and rural Nepal. *Journal of Transport and Supply Chain* 19(2), 110-125.

Davis, J., R. Adams, and P. Watson, 2019. Managing customer expectations in logistics and delivery: A focus on e-business. *Journal of E-Commerce and Service Management 18*(3), 102-112.

Gautam, R. 2015. The importance of logistics in the e-business supply chain. *Asian Journal of Logistics* 18(3), 50-70.

Giri, R., and M. Paudel, 2017. The impact of consumer demand on logistics in Nepal. *Journal of E-Business Logistics* 12(1), 35-50.

Giuffrida, M., R. Mangiaracina, A. Perego, and A. Tumino, 2020. Cross-border B2C e-commerce to China: An evaluation of different logistics solutions under uncertainty. *International Journal of Physical Distribution and Logistics Management 50*(6), 575-602.

Gorokhova, O., I. Dorokhova, and N. Samotiy, 2020. Impact of e-commerce development on logistic service in Ukraine: Perspectives and challenges. *Eurasian Journal of Business and Management 8*(2), 13-21.

Gupta, V., S. Kumar, and R. Agarwal, 2021. Analysis of delivery issues that customers face upon e-commerce shopping. *International Journal of E-Commerce Studies* 16(2), 125-138.

Hesse, M., and J.P. Rodrigue, 2004. The spatial and functional integration of logistics. *Journal of Transportation Geography* 12(2), 74-92.

Husnain, M., A. Khan, and F. Ahmad, 2018. Robustness of geography as an instrument to assess the impact of climate change on agriculture: Implications for logistics. *International Journal of Climate and Environmental Studies* 15(3), 220-230.

Hye, M., M. A. Alam, and M. A. Hossain, 2020. Factors affecting logistic supply chain performance: The role of blockchain adoption. *International Journal of Logistics Research and Applications* 23(3), 241-258.

Javed, M., and T. Wu, 2020. Road infrastructure and its positive impact on e-commerce logistics service quality and customer satisfaction. *Journal of Transportation and Logistics 35*(3), 150-160.

Johnson, M., and L. Clark, 2017. Customer expectations and their impact on service quality and business performance. *Journal of Business and Customer Satisfaction 29*(4), 233-245.

Joshi, P., and S. Pandey, 2016. Challenges in e-business logistics in Nepal. *Journal of Business and Logistics* 13(4), 180-200.

Karki, P., and S. Poudel, 2013. The impact of infrastructure on logistics in Nepal. *Journal of Infrastructure and Development* 17(3), 180-195.

Karki, P., and M. Sharma, 2019. Environmental sustainability in logistics: The case of Nepal. *Journal of Sustainable Logistics* 22(2), 115-130.

Kharel, S. 2015. Logistics challenges in Nepal's rural regions. *Journal of Rural Transport and Logistics* 8(1), 55-70.

Kumar, P., and A. Singh, 2022. Geographical terrain and its negative impact on customer satisfaction in logistics and delivery in e-business. *Journal of E-commerce and Logistics* 28(4), 190-205.

Kumar, R. 2023. Weather conditions and their impact on operational costs and delivery delays in logistics. *International Journal of Logistics and Supply Chain Management 40(*2), 70-80.

Kuo, Y., M. Chen, and C. Tsai, 2023. The environmental benefits of improving road infrastructure in logistics operations. *Journal of Sustainable Logistics 18*(2), 95-105.

Langley, C. J., and M. C. Holcomb, 1992. Logistics management: A key to customer satisfaction. *Journal of Business Logistics* 13(1), 45-60.

Lemoine, P., and T. Skjoett-Larsen, 2004. Logistics in e-commerce: A backbone of the supply chain. *Journal of E-Commerce Logistics* 25(3), 220-235.

Liu, Y., and X. Zheng, 2022. The relationship between road infrastructure and customer satisfaction in online shopping logistics. *International Journal of E-commerce Logistics 27*(2), 85-95.

Matopoulos, A., M. Vlachopoulou, and V. Manthou, 2009. Understanding the factors affecting e-business adoption and its impact on logistics processes. *International Journal of Logistics: Research and Applications* 12(3), 219-235.

Mentzer, J. T., 2001. Defining logistics and supply chain management. *International Journal of Physical Distribution and Logistics Management* 31(7), 100-107.

Miller, A., and S. Patel, 2018. The role of customer-centric strategies in brand loyalty and revenue growth. *Journal of Marketing and Customer Relations 45*(2), 65-75.

Poudel, S., and A. Bista, 2017. Barriers to advanced tracking systems in Nepal's logistics. *Journal of Supply Chain and Operations Management* 14(2), 75-90.

Rana, A., and R. Thapa, 2014. The challenges of last-mile delivery in Nepal. *Journal of Logistics and E-Commerce* 20(4), 140-155.

Rutner, S. M., and C. J. Langley, 2000. The logistics value chain: A new framework for understanding logistics. *Journal of Business Logistics* 21(1), 47-60.

Sharma, R. 2023. The new logistics policy of Nepal: Evaluating the approach of the private sector and government in enhancing the logistics sector. *Journal of South Asian Logistics 12*(2), 135-145.

Shrestha, P. (2010). Logistics in Nepal: Challenges and opportunities. *Journal of Business and Logistics* 18(2), 30-45.

Singh, R. 2020. Technological advancements in geographic information systems (GIS) for optimizing logistics in challenging geographical environments. *Journal of Logistics Technology* 34(1), 75-85.

Smith, J., and R. Johnson, 2018. The role of digital infrastructure in supporting e-business operations: High-speed internet, cloud computing, and cybersecurity. *Journal of Technology and E-Business 22*(1), 15-28.

Smith, J., and R. Jones, 2016. Financial resources and their role in expanding logistics capacity and improving customer relationship management systems. *Journal of Business Operations and Finance 25(*3), 125-136.

Tamang, S., and D. Gurung, 2019. Human resource challenges in logistics and delivery in Nepal. *Journal of Human Resources and Logistics* 5(2), 80-95.

Tao, Y., and Z. Li, 2019. Road infrastructure and warehouse operation efficiency in e-commerce logistics. *Journal of Business Logistics 22*(4), 110-120.

Timberlake, P., and D. Wiles, 2005. Weather's effect on retail operations: A case study of Wal-Mart's inventory strategy. *Retail Operations Journal 13(*3), 110-120.

Tripathi, A., A. Kumar, and P. Sharma, 2024. Marketing logistics and consumer behavior: An empirical study on Indian e-shoppers. *Journal of Retailing and Consumer Services* 7(8), 102-129.

White, L., and B. Walker, 2020. The impact of financial resource allocation on service reliability and customer satisfaction. *International Journal of Service Operations and Logistics 33(*2), 45-58.

Williams, L., D. Taylor, and P. Evans, 2019. The importance of strong digital infrastructure in e-business supply chain management. *International Journal of Logistics and E-Commerce 30*(4), 88-101.

Wilson, H., M. Harris, and S. Chang, 2020. Health and safety regulations in logistics and e-business: A critical review. *Journal of Occupational Health and Safety in E-Commerce 28(*3), 45-59.

Zhang, Y., L. Wang, and H. Liu, 2021. Seasonal variations in road conditions and their impact on e-commerce logistics performance. *Journal of Logistics and Supply Chain Management 30*(1), 120-130.

Zhou, Q., H. Liu, and X. Wang, 2019. Environmental impacts of terrain and its relation to climate change on logistics and agriculture. *Journal of Environmental and Agricultural Logistics 20*(3), 150-165.Top of Form