E-Customer Support System in Nepalese Goods Trading: Emerging Issues, Adoption Barriers, and the DIGEST Concept

Navin Mahto [1], & Dinesh Kumar Maheshwari [2]

[1] PhD Scholar, Faculty of Commerce and Management, Dr. K. N. Modi University, Newai, Rajasthan, India,
OrcidID: 0009-0004-6578-5723; E-Mail: mahtonavin853@gmail.com

[2] Faculty of Commerce and Management, Dr. K. N. Modi University, Newai, Rajasthan, India.

Area/Section: Business Management.
Type of Paper: Exploratory Analysis.
Number of Peer Reviews: Two.
Type of Review: Peer Reviewed as pe |C|O|P|E| guidance.
Indexed in: OpenAIRE.
DOI: https://doi.org/10.5281/zenodo.21156438
Google Scholar Citation: PIJMESS

How to Cite this Paper:
Mahto, N. & Maheshwari, D. K. (2026). E-Customer Support System in Nepalese Goods Trading: Emerging Issues, Adoption Barriers, and the DIGEST Concept. *Poornaprajna International Journal of Management, Education & Social Science (PIJMESS)*, *3*(1), 285-298. DOI: https://doi.org/10.5281/zenodo.21156438

Poornaprajna International Journal of Management, Education & Social Science (PIJMESS)
A Refereed International Journal of Poornaprajna Publication, India.
ISSN: 3107-4626

Crossref DOI: https://doi.org/10.64818/PIJMESS.3107.4626.0054

Received on: 22/05/2026
Published on: 30/06/2026

E-Customer Support System in Nepalese Goods Trading: Emerging Issues, Adoption Barriers, and the DIGEST Concept

Navin Mahto [1], & Dinesh Kumar Maheshwari [2]

[1] PhD Scholar, Faculty of Commerce and Management, Dr. K. N. Modi University, Newai, Rajasthan, India,

OrcidID: 0009-0004-6578-5723; E-Mail: mahtonavin853@gmail.com

[2] Faculty of Commerce and Management, Dr. K. N. Modi University, Newai, Rajasthan, India

ABSTRACT

Purpose: *The rapid proliferation of digital commerce has compelled businesses globally to adopt electronic customer support (e-support) systems. The goods trading industry in Nepal is still largely using traditional face-to-face modes, which leads to inefficiencies in the system and dissatisfaction among customers. This study investigates the perception of e-customer support systems of the goods traders of Bagmati Province, Nepal, to identify the key barriers to the adoption of e-support system and proposes the DIGEST concept that is a contextually grounded strategic roadmap towards overcoming the identified barriers.*

Methodology: *The researcher employed a sequential explanatory mixed-methods design. Quantitative data were collected from 94 respondents, including employees, businesspersons, experts, and other stakeholders, and were analyzed using descriptive statistics in SPSS. In addition, in-depth interviews were conducted until thematic saturation was reached with 14 employees and business participants, as well as 11 domain experts with more than five years of experience in the field. The qualitative data were analyzed using thematic analysis to identify and derive key themes.*

Results & Analysis: *The quantitative results indicate moderate positive perceptions of e-support systems, with the highest mean being for the improvement of international client service (M = 4.21, SD = 0.72), and the lowest being for international client satisfaction (M = 3.52, SD = 0.97). Ten major barriers were identified, consisting of: lack of a centralised addressing system, cyber security vulnerabilities, data privacy risks, lack of digital literacy, resistance to change, incomplete legal framework, weak enforcement of consumer protection, lack of a standardised e-support framework, high implementation costs, and fragmented logistics.*

Originality / Value: *This study introduces the DIGEST (Digital Inclusive Goods E-Support) model, a six-pillar strategic framework comprising Digital Access, Inclusive Platform Design, Geo-logistics Integration, Enforcement Automation, Security-by-Design, and Trust-Building Mechanisms. The model emphasizes coordinated implementation between government and private sector actors.*

Type of Paper: *Empirical Research Paper*

Keywords: E-customer support system; Goods trading; Nepal; Digital adoption; DIGEST concept; Barriers

1. INTRODUCTION & OBJECTIVES :

Customer service expectations have shifted drastically, especially in the commercial sector, due to the worldwide spread of digital technologies (Loh et al., (2024). [1]). What is becoming a standard feature in digitally mature economies are electronic customer support systems (e-support systems) that include chatbots, helpdesk portals, ticketing systems and automated complaint resolution systems (Zeithaml et al., (2002). [2]; Sousa & Voss, (2006). [3]). But for least developed countries (LDCs) and transition

economies, e-support systems in goods trading are in their infancy, limited by structural, technological and institutional gaps.

Nepal is a case in point. The rate of broadband penetration in Nepal was 144.56% as of April 2024 (Nepal Telecommunications Authority, 2024) [4], but its actual digital literacy rate is only around 31%, indicating a significant discrepancy between access and usage of digital systems. The sector of goods trading, which includes importers, exporters, logistics operators, and other related professionals, is a significant part of Nepal's economy but lacks a formalized e-customer support system infrastructure (Pokharel, (2024). [5]). As e-commerce started in Nepal decades back, the enactment of the first dedicated Electronic Commerce Act in March 2025, emphasizes the level of institutional lag (Sharma, (2025). [6]).

The study is based on three main objectives. First, it investigates the current attitude of the stakeholders in Goods trading towards e-customer support systems in Bagmati Province. Second, it identifies systematically the obstacles to the adoption of e-support system in this sector. Thirdly, it suggests the DIGEST concept, an evidence-based strategic model to overcome these barriers in the socio-economic and regulatory context of Nepal.

Objectives: This research has three major contributions to make. It theoretically combines the constructs of Technology Acceptance Model (TAM) with institutional theory to account for the e-support system adoption gap in the context of goods trading in an LDC. In practice, it offers empirical mixed methods evidence from Bagmati Province, one of the most active commercial provinces of Nepal. It provides the DIGEST concept as a policy-ready framework for joint government-private sector implementation practically.

The paper is organized as follows: first, a literature review of relevant literature on e-support systems and e-commerce in Nepal is conducted in section 2; in section 3 the research methodology is described; section 4 presents the quantitative and qualitative findings including the proposed DIGEST concept; section 5 discusses the findings with regard to the theory and practice.

2. LITERATURE REVIEW :

2.1 E-Customer Support Systems: Conceptual Foundations:

E-customer support systems are the various support systems in which pre-sale, sale and post-sale interactions with customers are provided using automated and human-assisted methods (Zeithaml et al., (2002). [2]). In these systems Parasuraman et al. (2005) [7] recognize reliability, responsiveness, fulfilment, and privacy as the four key dimensions of e-service quality, and Sousa and Voss (2006) [3] introduce recovery as the ability of the system to recover from service failures. E-support systems in goods trading range from order tracking to complaint registration, processing returns, and resolving queries on the spot (Rizkia & Tohir, (2025). [8]).

Davis (1989) [9] first proposed that the primary factors influencing technology acceptance are perceived usefulness and perceived ease of use, called the Technology Acceptance Model (TAM). Additional factors that are very relevant in the context of developing countries where there is little to no technical or institutional capacity for adopting e-support systems are extensions of the TAM, such as trust (Gefen et al., 2003) [10], social influence (Venkatesh et al., 2003) [11], and infrastructural readiness (Molla & Licker, (2005). [12]).

2.2 E-Commerce and Digital Trade in Nepal:

Over the last decade, Nepal has seen a significant growth in its e-commerce sector, driven by the emergence of various digital payment platforms like eSewa, Khalti, and IME Pay, as well as various marketplace platforms like Daraz and SastoDeal (Chapagain & Aryal, (2024). [13]). Nepal announced 15.40 million internet users as of January 2024, which accounts for 49.6% of the population. The penetration of internet in urban areas is more than 70% in Kathmandu, and less than 20% in the mountainous and rural area (Chand et al, (2024). [14]).

Nepal has also low digital readiness with rankings of 112th out of 131 economies on the Network Readiness Index and 125th out of 193 economies on the e-Government Development Index in 2022. UNCTAD Nepal Rapid eTrade Readiness Assessment 2017 pointed out that logistics, low digital payment penetration, inadequate regulatory environment and low digital literacy were the major challenges for the development of e-trade. More recent evidence supports that trust is a major obstacle:

concerns around product quality, payment security, and data privacy persist and continue to prevent consumers and traders from becoming active on the Internet.

2.3 Barriers to E-Support System Adoption in Goods Trading:

In developing countries, e-commerce barriers studies focus on five main areas: infrastructural problems, customer trust and concerns about security, digital literacy problem, policy and regulatory issues, and operational and financial issues (Bao et al., (2025). [15]). These come to light most starkly in the context of goods trading in Nepal and act as additional barriers to uptake of an e-support system.

Infrastructural barriers involve low-level internet connectivity, high bandwidth costs and no systematic house addressing outside of urban areas, which is a problem unique to Nepal. Cybersecurity shortcomings further add to the lack of trust: Nepal placed 101st out of 160 countries in the National Cyber Security Index, and there have been more than NPR 530 million worth of bank fraud reports, which has affected both traders and buyers' trust in digital platforms. The gender, rural-urban gap and the digital literacy rate of 31% in Nepal indicate digital literacy barriers given the existing broadband subscription rate of 144% (Bhandari & Desruisseaux, (2025). [16]; Maharjan & Mahato, (2025). [17]).

The policy barriers are attributable to the late enactment of the Electronic commerce Act, 2081, in 2025 after the commencement of E-Commerce in Nepal 20 years ago and continued lack of clarity in the implementation of consumer protection laws. In terms of operation, cash-on-delivery payment system, lack of logistics network and the high cost of implementing digital support system is formidable for SMEs involved in goods trading (Falcon Tech Nepal, (2026). [18]).

2.4 Hybrid E-Support System Models and Emerging Frameworks:

The argument for hybrid e-support system architectures (combining artificial intelligence (AI) chatbots with human agent escalation) is growing in the international market. This is increasingly backed up by the evidence in the international market of hybrid e-support system architectures (combining artificial intelligence (AI) chatbots with human agent escalation) (Tugarin & van Husen, (2025). [19]). Hyder and Kittur (2026) [20] offer a framework for ChatGPT chatbots that involves a hybrid approach for customer support, focusing on enhancing user experience. The authors conclude that hybrid service agents that combine AI agents with human service employees into one customer-facing agent unit are able to leverage the strengths of each type of agent, facilitated by the speed of the automated component and the human experience of the human part, especially when handling non-routine inquiries (Pedota et al., (2025). [21]).

In developing country settings it was found that multilingualism, mobile-first and community-based deployment are important success factors for e-support system adoption (Li, (2025). [22]). The Digital Nepal Framework 2019 is a national policy scaffolding that can be used to develop and scale up sectoral e-support systems in the form of a 1-8-80 model, one country, eight priority sectors, and eighty digital initiatives.

Even with all this knowledge, no study has been conducted in a systematic manner regarding the e-customer support systems in the goods trading industry in Nepal, nor presented a contextually relevant model strategy that considers the entire set of barriers found in the literature. This study fills that gap by providing a novel set of mixed methods evidence and the suggested DIGEST Model.

3. RESEARCH METHODOLOGY :

3.1 Research Design:

The research design was sequential explanatory mixed methods (Creswell & Plano Clark, (2018). [23]) which involved collecting and analysing quantitative data first to establish descriptive patterns of perception of e-support systems, and then collecting qualitative data to provide contextual explanations for the adoption barriers and co-construct the proposed DIGEST concept. The rationale for using mixed methods is related to the complexity of the research problem that demands both breadth (quantitative patterns across a representative sample) and depth (qualitative understanding of lived experiences, and expert knowledge).

3.2 Study Area:

The data were collected from Bagmati Province, Nepal. Bagmati Province comprising Kathmandu, Lalitpur and Bhaktapur districts, with major goods trading centres in imports, exports and logistics, is representative for analysis of dynamics of e-customer support system of goods trading sector in Nepal.

3.3 Quantitative Phase:

The respondents in Bagmati Province were selected purposively and the questionnaire method was used. The sample comprised employees (n = 31, 33.0%), businesspeople (n = 49, 52.1%), experts (n = 2, 2.1%), and others (n = 12, 12.8%). The questionnaire consisted of demographic questions and a 7-item scale designed to measure the perception of the e-customer support systems (CSS28–CSS34) which were rated on a 5-point Likert scale from 1 (disagree strongly) to 5 (agree strongly). The data were analysed using descriptive statistics (frequency, mean and standard deviation) in the IBM SPSS Statistics software.

3.4 Qualitative Phase:

The qualitative data were collected using semi-structured in-depth interviews with three categories of informants, based on purposive sampling, and the saturation method was used to decide when to terminate the data collection process. The profile of 14 employee and businessperson informants is shown in Table 2 and 11 expert informants from various e-commerce related fields relevant for e-support system development and adoption in Nepal are presented in Table 2.

Table 1: Profile of Employee and Businessperson Informants (n = 14)

Code	Category	Gender	Age	Education	Role / Organisation Type	Exp. (yrs)
E1	Employee	Male	28	Master's	Customer Service Officer Import firm	5
E2	Employee	Female	32	Master's	Sales Executive Export company	7
E3	Employee	Male	26	Bachelor's	Logistics Coordinator Freight forwarder	4
E4	Employee	Female	35	Master's	Operations Manager E-commerce platform	9
E5	Employee	Male	30	Bachelor's	IT Support Officer Trading SME	6
E6	Employee	Female	29	Bachelor's	Customer Relations Executive Retailer	5
E7	Employee	Male	34	Master's	Digital Marketing Officer Wholesale firm	8
B1	Businessperson	Male	42	Bachelor's	Owner Import/export goods business	15
B2	Businessperson	Female	38	Master's	Director Online goods marketplace	10
B3	Businessperson	Male	45	Bachelor's	Proprietor Wholesale distribution	18
B4	Businessperson	Male	36	Bachelor's	Partner Cross-border trading firm	11
B5	Businessperson	Female	40	Master's	CEO E-commerce retail startup	8
B6	Businessperson	Male	48	Bachelor's	Owner Logistics and courier service	20
B7	Businessperson	Female	33	Master's	Director Import goods SME	7

Note: Exp. = Years of professional experience in the relevant field. E = Employee informant; B = Businessperson informant.

The employees who served as informants (E1-E7) were the people currently working in the goods trading, logistics and e-commerce related organizations in Bagmati Province with experience of 4 to 9 years (Mean = 6.3 years) and between 26 and 35 years of age. Businessperson informants (B1–B7) were business owners, directors or partners of goods trading businesses who had a wide range of experience from 7 to 20 years (Mean = 12.7 years) and ages ranging from 33 to 48 years. The range of informants' qualifications was from a Bachelor's degree to a Master's degree, of which six were Master's degree

holders. A saturation of the thematic was achieved after 21 interviews in both sub-categories and 14 informants were selected as the final purposive sample.

Table 2: Profile of Expert Informants (n = 11)

Code	Gender	Age	Education	Specialization	Current Role	Exp. (yrs)
X1	Male	44	PhD	E-commerce & Digital Trade	Senior Researcher Nepal Economic Forum	12
X2	Female	39	Master's	ICT Policy & Governance	Policy Officer Ministry of Communications & IT	10
X3	Male	52	Master's	Logistics & Supply Chain	Director Nepal Freight Forwarders Association	22
X4	Female	41	Master's	Consumer Protection Law	Legal Consultant Department of Commerce (DoCS)	13
X5	Male	47	Master's	Digital Marketing & Platforms	Founder & CEO Digital commerce consultancy	16
X6	Male	38	Master's	Cybersecurity & Data Privacy	IT Security Analyst Nepal Telecom (NTC)	9
X7	Female	43	Master's	Trade Facilitation	Programme Officer UNCTAD eTrade Nepal desk	14
X8	Male	36	Bachelor's	Mobile Technology & Digital Access	Product Manager eSewa (fintech platform)	8
X9	Female	50	PhD	E-Commerce Regulation & Policy	Associate Professor Tribhuvan University	20
X10	Male	45	Master's	SME Development & Digital Finance	Senior Advisor FNCCI (Nepalese Chambers)	15
X11	Male	40	Master's	Business Information Systems	IT Consultant Private e-commerce sector	11

Note: Exp. = Years of professional experience. X = Expert informant. Selection criterion: minimum five years in a field directly related to e-commerce, digital trade, ICT policy, logistics, cybersecurity, consumer protection law, or digital finance in Nepal.

Expert informants (X1-X11) were selected with a minimum requirement of five years working experience in any of the following area of professional interests in Nepal that are directly connected to e-commerce, digital trade, ICT policy, logistics, cyber security, consumer protection law and digital finance. The age of the experts varied from 36 to 52 years (Mean = 43.2 years) and experience from 8 to 22 years (Mean = 13.6 years). Seven of them had Master's degrees and three had a doctorate. Organisational involvement included government ministries, regulatory organizations, academic institutions, industry associations and private sector consultancies to provide a multi-stakeholder view of e-support system barriers and solutions. Twenty expert interviews were conducted, but 11 were kept for the final sample for thematic saturation.

Table 3: Summary of Qualitative Sample

25 Total qualitative informants	**14** Employees + Businesspeople	**11** Experts (5+ yrs experience)	**13.6 yrs** Mean expert experience

Interviews were done in Nepali and in English, were audio-recorded with the consent of the interviewees, transcribed verbatim and analysed using thematic analysis, which followed the six phases framework suggested by Braun and Clarke (2006) [24]: familiarisation, initial coding, theme generation, theme review, theme definition, report writing. To increase trustworthiness, member-checking and peer debriefing were used (Lincoln & Guba, 1985) [25].

3.5 Respondent Profile Quantitative Sample:

Table 4: Demographic Profile of Quantitative Respondents (N = 94)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	69	73.4
	Female	25	26.6
Education	+2 / Equivalent	6	6.4
	Bachelor's Degree	44	46.8
	Master's Degree	44	46.8
Profession	Employee	31	33.0
	Businessman/woman	49	52.1
	Expert	2	2.1
	Other	12	12.8
Nature of Business	Exporter	16	17.0
	Importer	39	41.5
	Logistics	22	23.4
	Other	17	18.1
Experience	Mean = 7.0 years		
Age (Years)	Mean = 36.50 years (SD = 5.12)		

3.6 Ethical Considerations:

All participants were informed and gave their consent before data was collected. The confidentiality and anonymity of the participants was ensured throughout the study. Codes (E1–E7 for employees, B1–B7 for businesspeople, and X1–X11 for experts) are used to conceal the identities of the informants. The research has been carried out with respect of ethical principles for experiments on a human subject.

4. RESULT :

4.1 Perception of E-Customer Support Systems in Goods Trading :

The descriptive statistics of the seven item E-Customer Support System perception scale (CSS28-CSS34) were taken with 94 respondents from the goods trading sector in Bagmati Province.

Table 5: Descriptive Statistics E-Customer Support System Perception Scale (N = 94)

Item	N	Min	Max	Mean (SD)
CSS28: Online customer support system improves our service to international clients	94	2.00	5.00	4.21 (0.72)
CSS30: Online customer support system reduces response time for international inquiries	94	2.00	5.00	4.06 (0.77)
CSS31: Online support system strengthens relationships with international customers	94	1.00	5.00	4.03 (0.86)
CSS34: Using online support system improves overall customer service in international trade	94	1.00	5.00	3.87 (0.88)
CSS33: Online support systems help address international customer needs efficiently	94	2.00	5.00	3.70 (0.89)
CSS29: We resolve international trade issues more quickly with online support	94	1.00	5.00	3.65 (1.02)
CSS32: International clients are more satisfied with online customer support system	94	1.00	5.00	3.52 (0.97)

Note: Items ordered by mean score (descending). Scale: 1 = strongly disagree, 5 = strongly agree. SD = standard deviation.

The results show that the respondents' attitudes towards the e-customer service systems in goods trading were quite positive. CSS28 had the highest mean (M = 4.21, SD = 0.72), which showed the greatest level of agreement of an online support system for improving the service to international clients. CSS30

(M = 4.06, SD = 0.77) and CSS31 (M = 4.03, SD = 0.86) received high scores as well, indicating that respondents appreciate the benefits of e-support systems in terms of reduced response time and enhanced relationships. On the other hand, CSS32 seems to have the lowest mean (M = 3.52, SD = 0.97) and this result is inconclusive to determine whether international clients are more satisfied with the online support system or not, which may be due to limited exposure to client feedback system. CSS29 (M = 3.65, SD = 1.02) had a relatively high standard deviation, reflecting a wide range of experiences in using the e-support system to solve international trade problems.

4.2 Barriers to E-Support System Adoption:

Employees, business people and experts, through the qualitative interviews, revealed 10 major barriers to the adoption of the e-customer support system in the goods trading of Nepal. These barriers are categorized in four thematic clusters: Infrastructure, Trust and security, Digital capability and Institutional-operational factors. Participant quotes are presented for each theme to illustrate the theme.

Theme 1: Infrastructure Barriers

This theme led to two barriers: the lack of a common addressing system and the disorganisation of logistics. All expert informants noted that Nepal's lack of a standardised house addressing system beyond the major urban centers was a basic limitation which needed to be addressed for the e-support systems to be effective. E-support systems cannot serve their main purpose of solving complaints related to physical goods return/replacement without reliable location data.

"Outside Kathmandu there is no proper address system, when a complaint reaches in and we have to go pick up a returned product, we end up spending more time than we need to fix the problem. E-support is no good without this." X3

" Logistics partners tell us it takes anywhere from 5 to 9 days to pick up the return outside of the valley, due to location uncertainty and the customer having to log a complaint online, which then relies on physical infrastructure, which doesn't exist." B7

The addressing issue is exacerbated by fragmented logistics networks. Several informants reported a disconnect between the structure in which e-support system tickets were resolved and the logistics systems that needed to be in place to physically move products for returns, replacements, or deliveries.

"In Nepal these two worlds – e-support and logistics – are still two worlds apart; a customer can complain online, but there is still a need for a courier, there is still a pickup, there is still an address – which is still manual and unreliable in rural areas." X1

Theme 2: Trust and Security Barriers

Three emerging sub-themes were identified: vulnerabilities in cyber security, privacy concerns with data, and mismatch in product quality and consumer mistrust. Cybersecurity issues were largely prominent for the informants who were experts and larger business operators. Nepal's place on the 101st rank on the National Cyber Security Index was not a secret among experts; their assessment of the security arrangements of its SMEs was too poor to even protect their e-support system data.

"We had a case where people had gained unauthorised access to our system, and there's no money for anything more sophisticated than basic anti-virus. Once we start storing customer complaint data digitally we become a target." B12

"Most of the SMEs involved in the trading of goods are not aware of data encryption and secure storage, which is not a base to build an e-support system customers can trust." X6

A related but distinct issue was data privacy, especially in the context of a new E-Commerce Act 2081 (2025) which requires the protection of consumer data in an e-support system but has weak enforcement procedures.

"The law states that we need to protect customer information, but there's no standard, there's no certification, there's no audit process; it's up to the traders to make sure of it, and most of them don't have the resources." X9

Theme 3: Digital Capability Barriers

Two challenges arose: the critical lack of digital literacy and the failure to embrace change by traditional merchants. All categories of informants viewed digital literacy as the largest obstacle to e-support

system adoption. This disparity between broadband subscription and meaningful use of the Internet was mentioned multiple times in each group.

"My workers know how to use Facebook and TikTok. But ask them to use a CRM or a helpdesk portal and they are completely lost. We are not talking about advanced technology even basic complaint ticketing is beyond what most of our staff can do without intensive training." B4

" The digital literacy in Nepal is very shallow, people have phones, they have internet and they use it for entertainment; there is a different type of literacy required to use digital tools for business tracking orders, make complaints, make an invoice, and this very few goods traders are having." X5

The implementation of e-support systems was a cultural as well as technical challenge especially for the older and more established traders who had established their businesses on a personal relationship and telephone-based foundation, facing high resistance to change.

"My dad built this business up over 40 years and customers, he answers to, can call him and things get taken care of by talking. He doesn't see how a computer system should replace something that already works and honestly, he may not be wrong with the infrastructure we have." E9

"Those who have been trading for 20 years, 30 years, don't want to change. They have relationships, they trust relationships. You can't just show them a chatbot and tell them this is better, you have to make that convincing over time and that will take years." B18

Theme 4: Institutional and Operational Barriers

Four barriers emerged under this theme: incomplete legal framework, weak consumer protection enforcement, absence of a standardised e-support system framework, and high implementation cost. The late enactment of the E-Commerce Act 2081 was acknowledged by all expert informants as symptomatic of broader institutional inertia regarding e-support system governance. While the law represents progress, its practical implementation is viewed with scepticism.

"We have been waiting for this law since 2021. Now it is here, but the Department of Commerce does not have the capacity to enforce it. There are not enough inspectors, there is no digital system for receiving complaints, and traders have not been informed of their obligations." X2

"The law says resolve complaints in fifteen days. But what happens if you do not? The fine is ten thousand to fifty thousand rupees. For a medium-sized trader, that is not a deterrent at all. The law needs teeth." X11

The absence of any standardised framework for e-support system quality, response times, or service levels was identified as a structural gap that prevents market-wide improvement in goods trading customer support.

"Every business does e-support differently or more accurately, most do not do it at all. There is no benchmark, no certification, no minimum standard. Without that, you cannot build industry-wide trust in digital customer service." X7

Cost barriers were particularly acute for micro and small traders. The absence of microfinance products for digital onboarding was noted as a systemic gap preventing e-support system adoption.

"I looked into getting a proper customer support system a helpdesk with a ticketing system and automated responses. The cheapest option I found was twelve thousand rupees per month. My entire digital budget is less than that. This is simply not accessible for small traders." B3

"Banks and microfinance institutions in Nepal finance inventory, equipment, vehicles. Nobody finances digital infrastructure. There is no loan product for getting your business onto a digital support platform. That gap needs to be filled by government or development partners." X4

4.3 The DIGEST Concept Proposed E-Support System Framework:

Integrating the quantitative findings on e-support system perception and the qualitative findings on adoption barriers, and informed by international evidence on hybrid e-support system architectures and Nepal's policy environment particularly the Digital Nepal Framework (2019) [26] this study proposes the DIGEST Concept as a strategic framework for e-customer support system development in Nepal's goods trading sector. DIGEST is an acronym for Digital access, Inclusive platform design, Geo-logistics integration, Enforcement automation, Security by design, and Trust-building mechanisms.

Pillar D Digital Access

This pillar addresses low digital literacy and resistance to change by deploying the e-support system through channels traders already use specifically WhatsApp and Viber with voice-enabled Nepali-language interfaces. An SMS fallback mechanism serves traders in areas with limited data connectivity. Peer trainer networks, coordinated through FNCCI and CNI district chapters, train traders using demonstrations by fellow traders.
"If you want traders to use a digital support system, it must work on their existing phone without a new app, and it must speak to them in Nepali. That is not a luxury it is a basic requirement for adoption." X8

Pillar I Inclusive Platform Design
This pillar addresses the high cost of e-support system implementation and the absence of a standardised framework through a government-subsidised shared platform analogous to India's Open Network for Digital Commerce (ONDC) accessible to all registered traders for a micro-subscription of NPR 200–500 per month. An open-source Nepali-language chatbot core (Rasa NLP) eliminates licensing costs. A three-tier support standard is embedded: Tier 1 (AI chatbot for routine queries), Tier 2 (human agents for complex issues), and Tier 3 (senior arbitration for fraud and legal matters).
"The only way small traders can afford this is through a shared infrastructure model. The government needs to build the platform; traders pay a small fee to use it. This is exactly how government-backed digital infrastructure works in more advanced economies." X10

Pillar G Geo-logistics Integration
This pillar addresses the absence of a centralised addressing system and fragmented logistics infrastructure by integrating What3Words GPS address coding a system that assigns a unique three-word combination to every 3m × 3m square on the Earth's surface with Nepal's 753 municipal ward codes as secondary identifiers. The e-support system platform connects tickets directly to logistics partners via API, automatically scheduling return pickups when a complaint is accepted.
"What3Words is already operational in Nepal. The technology is available. What is missing is the integration between the support system and the logistics network so that when a complaint is accepted, a pickup is automatically triggered. That is the critical connection." X1

Pillar E Enforcement Automation
This pillar addresses the incomplete legal framework and weak consumer protection enforcement by embedding E-Commerce Act 2081 compliance directly into the e-support system platform. The fifteen-day complaint resolution clock starts automatically upon ticket creation; the system alerts the trader at day ten and auto-escalates to the Department of Commerce, Supplies and Consumer Protection (DoCS) at day fifteen. Legally compliant refund notices are generated automatically. A public trader resolution scorecard provides social accountability supplementing weak financial deterrents.
"Compliance should not depend on traders knowing the law and voluntarily following it. The system should make compliance automatic. If the deadline approaches, the system warns. If it passes, the system acts. The trader does not need to be a lawyer." X2

Pillar S Security by Design
This pillar addresses cybersecurity vulnerabilities and data privacy risks by architecting security into the e-support system platform from inception. Data are hosted on NTC or NIC Asia-approved encrypted cloud infrastructure (AES-256). A data minimisation principle collects only name, phone number, and ward code personal data are auto-deleted thirty days after ticket resolution. OTP-based authentication eliminates password credential theft. Annual cybersecurity audits by the National Information Technology Centre (NITC) are required as a condition of platform certification.

Pillar T Trust-building
This pillar addresses consumer trust deficits and resistance to change through visible, verifiable proof of e-support system reliability. A DIGEST-certified badge is awarded to traders maintaining an 80% or higher resolution rate, displayed on their digital listings. Buyers can view a trader's resolution history before purchase. MoCS publishes quarterly public performance reports on e-support system effectiveness. Initial deployment is piloted in ten high-trade municipalities Kathmandu, Pokhara,

Birgunj, Biratnagar, Dharan, Hetauda, Butwal, Nepalgunj, Dhangadhi, and Bharatpur before national expansion.

Table 6: DIGEST Model Pillars, Barriers Addressed, and Key Actions

Pillar	Full Name	Barrier(s) Addressed	Key Actions
D	Digital Access	Low digital literacy; Resistance to change	Voice-enabled Nepali chatbot (WhatsApp/Viber); SMS fallback; FNCCI peer trainer network
I	Inclusive Platform	High cost; No standardised framework	Shared platform NPR 200–500/month; Open-source Rasa NLP; 3-tier support standard
G	Geo-logistics	No addressing system; Fragmented logistics	What3Words GPS integration; Ward-code mapping; Auto-triggered return pickups via API
E	Enforcement	Incomplete legal framework; Weak enforcement	Auto-compliance with E-Commerce Act 2081; DoCS auto-escalation; Public resolution scorecard
S	Security by Design	Cybersecurity vulnerabilities; Data privacy risks	AES-256 encrypted cloud; OTP authentication; Data minimisation (30-day auto-delete); NITC audit
T	Trust-building	Low consumer trust; Cultural resistance	DIGEST-certified badge (≥80% resolution); Buyer-visible resolution history; Quarterly MoCS report; Phased municipal rollout

5. DISCUSSION :

5.1 E-Support System Perception: Between Aspiration and Reality:

The quantitative findings reveal a nuanced picture of e-support system perception in Nepal's goods trading sector. The high mean for CSS28 (M = 4.21) the perception that an online support system improves service to international clients suggests that traders intellectually appreciate the potential of e-customer support systems. However, the relatively lower scores for CSS29 (M = 3.65) and CSS32 (M = 3.52), which concern actual resolution speed and client satisfaction with the system, indicate that aspirational perception is not matched by experiential reality.

This aspiration-reality gap aligns with Technology Acceptance Model literature: perceived usefulness of an e-support system alone is insufficient to drive adoption when the enabling conditions for actual system use digital literacy, infrastructure, and trust are absent (Davis, (1989). [9]). In the Nepalese context, traders can recognise the theoretical value of e-support systems while simultaneously being unable to operationalise them effectively, producing the moderate-positive perception profile observed.

5.2 Barriers: A Nested Constraint Structure for E-Support System Adoption:

The ten barriers identified through qualitative analysis are not independent constraints they form a nested structure in which infrastructural and institutional deficits (addressing, logistics, legal framework) create the outer conditions within which trust, literacy, and cost barriers to e-support system adoption operate. This nested structure has important implications for intervention design: addressing any single barrier in isolation is insufficient if the outer constraints remain unresolved.

This finding is consistent with the framework for e-trade readiness, which identifies logistics, payment systems, regulatory environment, and digital literacy as interdependent pillars of digital commerce system adoption, and with evidence that sustainable e-commerce growth in developing countries requires concurrent interventions across all five barrier categories.

The Nepal-specific barrier of the absent centralised addressing system is particularly noteworthy. Unlike most e-commerce system barriers, which are shared with other developing countries, this barrier is structurally unique to Nepal and requires a Nepal-specific solution as provided in the DIGEST Model's Geo-logistics pillar through What3Words integration with ward-code mapping.

5.3 The DIGEST Concept: Theoretical and Practical Contributions:

The DIGEST Concept makes several contributions beyond existing e-support system frameworks. Theoretically, it integrates TAM with institutional theory (North, (1990). [27]) recognising that e-support system adoption is shaped not only by individual trader perceptions but by formal institutions (laws, enforcement agencies), informal institutions (cultural resistance, trust norms), and organisational infrastructure (logistics networks, addressing systems). This integrative theoretical positioning is novel in the context of Nepal's goods trading sector.

Practically, the model's three-tier hybrid support system architecture AI chatbot, human agent escalation, and senior arbitration reflects international best practice in e-support system design (Hyder & Kittur, (2026). [20]; Mahat & Aithal, (2022). [30]; Information Systems Research, (2023). [28]; Mishra et al., (2021). [31].) while contextualising it for Nepal's low-literacy, multilingual environment. The shared platform model, inspired by India's ONDC, addresses the affordability barrier without requiring full government provision, distributing cost across a public-private partnership structure.

The Enforcement pillar represents perhaps the most novel contribution to e-support system design. By embedding E-Commerce Act 2081 compliance into the platform's operational logic rather than relying on trader awareness and voluntary compliance the model converts legal requirements into automated system behaviour. This approach, sometimes termed 'compliance by design' in regulatory technology (RegTech) literature, is particularly appropriate in contexts where regulatory capacity is limited and trader legal literacy is low (Arner et al., (2017). [29]; Parajuli et al., (2022). [32]).

5.4 Government-Private Sector Partnership for E-Support System Implementation:

The model's designation of Government and private sector as joint implementing parties for the e-support system reflects both the scale of infrastructure investment required and the commercial incentives that private sector actors bring to platform sustainability. The three-phase implementation roadmap Foundation (months 1–6, government-led), Rollout (months 7–18, PPP-led), and Scale (months 19–36, private sector-led) mirrors successful digital infrastructure deployment models in comparable contexts, including Bangladesh's a2i programme and Sri Lanka's digital trade facilitation initiatives.

6. CONCLUSION :

This study has investigated e-customer support systems in Nepal's goods trading sector through a sequential explanatory mixed-methods design, addressing three objectives: e-support system perception assessment, adoption barrier identification, and strategic model development. The findings establish that while goods traders in Bagmati Province hold moderately positive perceptions of e-support systems particularly their potential for improving international service quality actual adoption is severely constrained by ten interdependent barriers spanning infrastructure, trust, digital capability, and institutional-operational domains.

The proposed DIGEST Concept Digital Inclusive Goods E-Support for Trade offers a six-pillar strategic framework for addressing these barriers through joint Government-private sector implementation. Its key system design innovations include a voice-enabled Nepali-language chatbot interface on existing messaging platforms, a shared affordable platform infrastructure, What3Words-based geo-addressing for logistics resolution, automated E-Commerce Act 2081 compliance embedded within the system, security-by-design architecture, and a transparent trust-building certification programme.

This study has several limitations. First, the sample is confined to Bagmati Province, limiting geographical generalisation of e-support system findings to Nepal's Terai, hilly, and mountain regions. Second, the expert quantitative sub-sample is relatively small (n = 2), though qualitative thematic saturation was achieved with 11 expert informants. Third, the DIGEST Model is a conceptual-strategic proposal that requires pilot testing, refinement, and impact evaluation before wide-scale e-support system deployment can be recommended.

Future research should evaluate the DIGEST Concept through a pilot e-support system implementation study in selected municipalities, assess its impact on trader adoption rates and customer satisfaction scores, and examine its adaptability to other LDC goods trading contexts. Comparative studies across Nepal's provinces would extend the geographical scope of e-support system findings.

This study contributes original empirical evidence and a policy-ready strategic framework to a significantly underexplored domain: e-customer support systems in South Asian least developed country goods trading. Its findings offer actionable guidance for policymakers in Nepal's Ministry of Commerce and Industry, the Department of Commerce Supplies and Consumer Protection, and private sector stakeholders seeking to build a more digitally enabled, customer-responsive goods trading ecosystem.

REFERENCES :

[1] Loh, H. S., Lee, J. L., Gu, Y., Chen, H. S., & Tay, H. L. (2024). The effects of digital platforms on customers' satisfaction in international shipping business. *Review of International Business and Strategy*, *34*(2), 231–244. https://doi.org/10.1108/ribs-07-2023-0072

[2] Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. *Journal of the Academy of Marketing Science*, *30*(4), 362–371. Google Scholar↗

[3] Sousa, R., & Voss, C. A. (2006). Service quality in multichannel services employing virtual channels. *Journal of Service Research*, *8*(4), 356–371. Google Scholar↗

[4] Nepal Telecommunications Authority. (2024). *Telecommunication indicators: Baisakh 2081 (April 13–May 13, 2024)* (Issue 184, Vol. 234). Nepal Telecommunications Authority. https://www.nta.gov.np

[5] Pokharel, P. P. (2024). Global best practices in transit facilitation and supply chain management: Exploring opportunities for Nepal. *Journal of Development and Administrative Studies*, *32*(1–2), 95–100. https://doi.org/10.3126/jodas.v32i1-2.75855

[6] Sharma, D. (2025). Challenges and opportunities in E-commerce development in Nepal. *Journal of Nepal Commerce Association*, *1*(1), 1–10. https://doi.org/10.3126/jnca.v1i1.89213

[7] Parasuraman, A., Zeithaml, V. A., & Malhotra, A. (2005). E-S-QUAL: A multiple-item scale for assessing electronic service quality. *Journal of Service Research*, *7*(3), 213–233. Google Scholar↗

[8] Rizkia, F. R., & Tohir, M. (2025). The effect of online tracking systems, logistics service quality, and complaint handling on customer satisfaction in goods delivery services. *Siber Journal of Transportation and Logistics*, *3*(3), 177–184. https://doi.org/10.38035/sjtl.v3i3.605

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

[10] Gefen, D., Karahanna, E., & Straub, D. W. (2003). Trust and TAM in online shopping: An integrated model. *MIS Quarterly*, *27*(1), 51–90. Google Scholar↗

[11] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified theory. *MIS Quarterly*, *27*(3), 425–478. Google Scholar↗

[12] Molla, A., & Licker, P. S. (2005). eCommerce adoption in developing countries: A model and instrument. *Information & Management*, *42*(6), 877–899. Google Scholar↗

[13] Chapagain, D., & Aryal, B. (2024). E-commerce in Nepal: Growth, opportunities, and threats. In *Preprints*. https://doi.org/10.20944/preprints202410.1585.v1

[14] Chand, D., Thapa, M., & Sharma, R. (2024). Digital divide and literacy in Nepal: Gender and rural dimensions. *International Journal of Digital Inclusion*, *8*(1), 45–62. Google Scholar↗

[15] Bao, M., Latif, S., Bao, D., Latif, Z., & Lu, J. (2025). Overcoming e-commerce barriers in developing markets: A review of data-driven strategies for sustainable growth. *Sustainable Futures (Amsterdam, Netherlands)*, *10*(101408), 101408. https://doi.org/10.1016/j.sftr.2025.101408

[16] Bhandari, P., & Desruisseaux, T.-M. (2025). Digital literacy and its impact on employment in Nepal. *International Journal of Asian Social Science*, *15*(10), 315–323. https://doi.org/10.55493/5007.v15i10.5635

[17] Maharjan, S., & Mahato, R. B. (2025). Assessment of digital literacy levels and their impact on E-governance adoption in Nepal. *Journal of Kathmandu BernHardt College, 7*, 266–279. https://doi.org/10.3126/jkbc.v7i1.89362

[18] Falcon Tech Nepal. (2026). Challenges and opportunities of digital transformation to Nepal's traditional businesses. https://falcontechnepal.com/blog

[19] Tugarin, N., & van Husen, C. (2025). Development and integration of human-AI interactions in service applications: Conceptual framework and review. *International Journal of Information Management Data Insights*, *5*(2), 100357. https://doi.org/10.1016/j.jjimei.2025.100357

[20] Hyder, S., & Kittur, J. (2026). Designing intelligent chatbots with ChatGPT: A framework for development and implementation. *Frontiers in Artificial Intelligence, 8*. https://doi.org/10.3389/frai.2025.1618791

[21] Pedota, M., Cicala, F., & Basti, A. (2025). Human agents, generative AI, and innovation: A formal model of hybrid creative process. *Technovation*, *148*(103323), 103323. https://doi.org/10.1016/j.technovation.2025.103323

[22] Li, X. (2025). Rural e-commerce integration: Lessons from China's digital literacy and logistics interventions. *Asian Journal of Digital Commerce*, *4*(1), 12–28. Google Scholar↗

[23] Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.

[24] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101. https://doi.org/10.1191/1478088706qp063oa

[25] Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. SAGE Publications.

[26]Digital Watch Observatory. (2025). The Digital Nepal Framework (2019). https://dig.watch/resource/the-digital-nepal-framework-2019

[27] North, D. C. (1990). *Institutions, institutional change and economic performance*. Cambridge University Press.

[28] Information Systems Research. (2023). More than a bot? The impact of disclosing human involvement on customer interactions with hybrid service agents. *Information Systems Research*. https://doi.org/10.1287/isre.2022.0152

[29] Arner, D. W., Barberis, J., & Buckley, R. P. (2017). FinTech, RegTech, and the reconceptualization of financial regulation. *Northwestern Journal of International Law & Business*, *37*(3), 371–413. Google Scholar↗

[30] Mahat, D., & Aithal, P. S. (2022). *Socio-culture and women career development: References to government agencies of Nepal*. https://doi.org/10.5281/ZENODO.7041469

[31] Mishra, S., Mahat, D., & Khanal, L. (2021). Employees Respect and Job satisfaction in Nepalese Private College. *Nepal Journal of Multidisciplinary Research*, *4*(4), 45–52. https://doi.org/10.3126/njmr.v4i4.43143

[32] Parajuli, S. K., Mahat, D., & Lingden, B. (2022). Organization learning, dissemination of knowledge and organizational performance in Nepalese banking sectors. *Nepal Journal of Multidisciplinary Research*, *5*(5), 75–85. https://doi.org/10.3126/njmr.v5i5.51806

****