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An Analysis of Experiences and Operational Challenges of E-Commerce in Bhutan: Perspectives of Management Students and Registered Online Retailers

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Abstract

E-commerce, driven by the growth of the internet, is gaining momentum in Bhutan; however, its research remains focused on consumer satisfaction, with little attention to retailers. This mixed-methods study addresses this issue by analysing survey data of 387 management students and semi-structured interviews with six registered retailers. Thus, the work takes into account the perspectives of student consumers of Bhutanese e-commerce platforms on the premise of Oliver's Expectation Confirmation Theory. Results showed aggregate service ratings remained above the 3.00 benchmark, though item-level analysis revealed significant technology performance gaps (time-saving: M = 3.84; ease of use: M = 3.87), service reliability (accuracy: M = 3.57), and product quality (absence of defects: M=3.17). Significant platform-specific exploratory associations were observed between product defects (p = 0.020), location constraints (p = 0.032), and site trust (p = 0.026). Findings reveal that customers valued convenience while expressing concerns over refund systems and data security. In parallel, retailers highlighted challenges such as adapting to advanced technologies, inconsistency in systems, and maintaining customer trust. These findings provide initial evidence on the dual perspectives of potential Bhutanese e-commerce consumers and retailers, emphasising the need to strengthen Bhutan's emerging digital economy.

Research Article

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Introduction

E-commerce has become a central component of global economic activity, driven by advances in digital infrastructure, online payment systems, and platform-based retail (Suciati et al., 2025). With the growth of market participants from Asia

Pacific in the global market (Asian Development Bank, 2023), its rapid growth is driven by expanding internet access and digital platforms (Suciati et al., 2025). However, research on this issue is largely centred on mature economies, with limited insight into emerging digital markets (Wen & Xin, 2026).

In Bhutan, although fewer registered e-commerce businesses exist, recently there has been a growth of informal and unregistered agents through social media. According to the national reports, approximately 74% of consumers purchase from unregistered agents on platforms such as TikTok, Facebook, and Instagram, with only 26% transacting through registered e-commerce providers (Office of Consumer Protection, 2022). Despite institutional support for digital transformation, the sector faces persistent challenges, including limited logistics capacity, uneven ICT infrastructure, and barriers to establishing customer trust (Pradhan & Choden, 2025). These conditions make Bhutan a distinct and analytically relevant context for examining e-commerce development in small, regulated, and geographically constrained economies.

However, the absence of scholarly works on e-commerce in Bhutan (except for Christopher & Kumar, 2024) makes it difficult to understand the experiences and challenges faced by licensed retailers. Their work also heavily focused on issues faced by customers, undermining the clarity of e-commerce sustainability through the lens of retailer capacity.

Therefore, this mixed-method study intends to understand and analyse the experiences and challenges of consumers of e-commerce platforms in Bhutan. We analyse from the perspective of student e-commerce consumers, given the higher popularity among this customer segment (Palinkas et al., 2013; Ondas et al., 2026). Further, we aim to gain in-depth perspectives of retailers to understand the operational challenges of registered e-commerce retailers in Bhutan. By this, our work aims to provide context-specific insights to inform the local policy rather than advancing the literature.

Literature review

The conceptual framework (Figure 1) is grounded in Oliver's (1980) Expectation-Confirmation Theory (ECT), which posits how consumer expectations influence their perception of performance, consequently determining their satisfaction and repurchase intention. If consumers' lived experience of service reliability or technology fails to meet their expectations, it results in negative disconfirmation. These experiences shape the levels of trust and satisfaction; however, this study does not test the complete causal ECT pathway or continued usage intention. Instead, ECT is applied as an analytical lens to identify and evaluate localised performance gaps within this specific digital market segment.

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Figure 1

Conceptual Framework

E-commerce service experiences and challenges

Service reliability

The quality of a website plays a vital role in engaging and sustaining e-commerce customers. Suhartitni et al. (2023) highlight how low-quality media and weak branding significantly reduce satisfaction. While innovative service experiences offer retailers a competitive edge (Salameh, et al., 2018), baseline functional reliability alone may not ensure long-term retention. Although most studies assume retailers can improve service through digital investment, this may not hold in contexts with limited technical or financial resources. In such settings, reliability is heavily dependent on technological capacity, institutional support, and logistical conditions. This creates a gap in understanding whether reliability challenges stem from firm capability or broader structural limitations.

Product quality

Product quality plays a critical role in the online environment since customers are cautious about the information obtained (Ghasemaghaei & Hassanein, 2013). The touch and feel factor is one of the primary challenges faced by the customer, as an expected quality product is not delivered as shown in the online image, leading to customer dissatisfaction (Khan, 2016). Existing literature does not clarify whether product quality concerns are driven by genuine supply-side limitations or by weak consumer protection mechanisms. Moreover, product quality is not an isolated factor; it directly influences trust and repeat purchase behaviour. This suggests that product quality functions both as an operational issue and as a trust-building mechanism, particularly in smaller and developing markets where standardisation and enforcement systems are still evolving.

Technology

Technological advancements have created commercial opportunities, forming entirely new global and national trading networks. Retailers must

increasingly focus on integrating emerging technologies to compete with online platforms and improve the customer shopping experience (Voelz et al., 2021). While advanced digital capabilities can improve service delivery and operational efficiency, their adoption often depends on infrastructure, cost, and technical expertise. Furthermore, technology is interdependent with other constructs, particularly service reliability and data security, as inadequate systems can compromise both user experience and information protection. According to Hole and Pawar (2019), customers expect retail stores to be adequately integrated with retailers' digital capabilities and competencies. However, such expectations may be difficult to meet in developing digital economies where technological readiness is still evolving.

Regulatory and institutional system

Regulatory and institutional systems encompass vision, action and stability of the country's leadership, alongside core government policies and market regulations (Grab et al., 2018). Challenges such as limited payment gateway options, inadequate ICT infrastructure, and fragmented regulatory policies are significant barriers to the growth of e-commerce in developing economies (Bao et al., 2025). Moreover, also posing risk to consumers' data safety and risks in online transactions due to a weaker regulatory framework (Wen & Xin, 2026). Such issues could directly influence technological adoption, product quality, trust, and data security; weak regulatory enforcement can worsen transaction safety vulnerabilities, while overly restrictive policies may hinder platform innovation.

Environmental impact

The technology's environmental repercussions are not inherent to the system itself but depend heavily on the social and economic context. While e-commerce can create efficiencies, it introduces systemic vulnerabilities as climate-related disruptions become more frequent (Pezoa et al. 2026). Studies indicate that extreme weather events and changing environmental conditions can lead to delays, increased costs, and operational challenges for retailers and logistics providers (Touloumidis et al., 2025). Consequently, localised environmental conditions are closely linked to service reliability and product delivery, as transport and infrastructure disruptions directly impact customer experience, consequently affecting repurchase intentions.

Trustworthiness

Trust is a foundational element of e-commerce, directly influencing willingness to engage in online transactions where physical interaction is absent (Soleimani, 2021; Thongpapanl et al., 2025). Data breaches, cyber threats, and misuse of personal information are major barriers to adoption (Wen & Xin, 2026).

However, there is less clarity on how these measures are implemented and perceived in contexts with varying levels of technological maturity and regulatory enforcement. This suggests that trustworthiness should be understood as an emergent outcome of multiple interacting factors rather than a standalone construct (Soleimani, 2021). This creates an unresolved debate on whether trust is primarily a security issue or a broader system-level outcome shaped by market and institutional conditions (Thongpapanl et al., 2025).

Data security

E-commerce offers the commercial sector significant operational opportunities while simultaneously introducing critical vulnerabilities, such as data breaches and transaction fraud (Khan & Shazia, 2019; Wen & Xin, 2026). E-commerce security is a complex component that directly shapes an end user's daily payment engagement with digital platforms (Niranjanamurthy & Chahar, 2013). These prior studies suggest increasing concerns around data privacy, hacking, and vulnerabilities associated with digital transactions and interconnected systems. Data security is therefore closely linked to both technological infrastructure and user trust, as weak systems can undermine confidence in digital transactions and reduce adoption. While robust security measures are often proposed as solutions, the implementation can be constrained by technological capacity and regulatory enforcement.

Methodology

Research design

A mixed-method approach was applied, integrating a quantitative survey for the customer demographic and perspectives on service quality dimensions and a qualitative framework for the e-commerce retailers. The questionnaire underwent a two-stage validation process. First, content validity was established by submitting the draft survey to two civil servants at the Royal Government of Bhutan, experts in the field of management, whose feedback ensured the items accurately measured the identified constructs. Second, a pilot test was conducted with 15 management students (who were excluded from the final sample) to evaluate the functionality of the online survey. Based on the pilot results, minor adjustments were made to the phrasing and repetitive questions were removed. Finally, the internal consistency of the instrument was confirmed using Cronbach's Alpha.

Population and sample

The target population for the consumer dataset comprised 2,279 management students across three institutions: Gedu College of Business Studies (1,350), Norbuling Rigter College (556), and Royal Thimphu College (373). From this population, a final sample of 387 students with direct e-commerce experience

was selected. For the qualitative dataset, six registered e-commerce businesses in Bhutan were selected based on active operation and willingness to participate in semi-structured interviews.

Sampling frame

The study employed purposive sampling for both the quantitative and qualitative phases. For management students, this method targeted a critical case demographic (Palinkas et al., 2013) of early adopters possessing the digital and financial literacy required to evaluate e-commerce service dimensions. For retailers, it ensured the inclusion of registered entities with active operational histories to explore systemic barriers. This strategy prioritises depth of experience over broad representation, aligning with exploratory research in emerging digital markets (Suciati et al.,2025). To ensure adequate statistical power for inferential analysis, the Krejcie and Morgan (1970) formula was utilised as a benchmark for the minimum required sample size, based on a finite population of 2,279 management students, resulting in a required sample size of 329 at a 95% confidence level, 5% margin of error and 50% population proportion.

Qualitative sample size was determined by monitoring thematic code stability rather than an absolute theoretical saturation. Given the homogenous profile of the participants: registered e-commerce operators in Bhutan facing identical banking and logistical infrastructure, six detailed interviews (Retailer 1, 2, 3,4, 5, & 6 – pseudonyms used) were sufficient for exploratory adequacy. Stability was assessed concurrently during data collection; by the fifth and sixth interviews, structural codes regarding regulatory flux, manual payment tracking, and terrain barriers were systematically repeating, and no unanticipated sub-themes or operational codes emerged from the narrative text.

Data collection

Data collection utilised structured questionnaires for customers and unstructured questions for retailers. The customer questionnaire was divided into two parts: Section A gathered demographic factors for contextual interpretation, while Section B measured the core research constructs using a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). For the qualitative phase, open-ended questions guided semi-structured interviews with the owners of the six registered e-commerce platforms.

Data Analysis

Univariate Analysis

Construct-level means (M) were computed by averaging the scores of all underlying items within a theme. No reverse coding was required as all items were phrased in the positive direction (e.g., the system is accurate). While aggregate

means provide a general sentiment toward a construct's importance, item-level t-tests were used to identify specific performance gaps where individual service attributes fell below the neutral threshold of 3.00 (Bernstein, 2005).

Sample description

The demographic profile of the 387 respondents reveals several key demographic insights. The sample was predominantly female (59.7%). The majority (85.1%) of total respondents fell within the 18–24 age cohort. Regarding parental occupation, farming backgrounds represented the largest segment (35.7%). In terms of institutional distribution, the largest group was from GCBS (43.4%), followed by RTC (33.6%) and NRC (23.0%). Finally, financial status was nearly evenly split between self-financed students (49.1%) and those receiving government-funded scholarships (44.2%), with 6.7% supported by alternative funding sources.

1.1. *Reliability test for each factor*

Table 1

Reliability Statistics for e-commerce Students

SN	Factors	Items	Cronbach's Alpha
1	Service Reliability	4	0.70
2	Product Quality	3	0.76
3	Technology	3	0.86
4	Environmental Impact	3	0.74
5	Trustworthiness	3	0.82
6	Data Security	3	0.82

To evaluate internal consistency (Bonett & Wright, 2014), Cronbach's alpha was calculated, mapping different operational and behavioural dimensions (Table 1). All factors exceeded the standard acceptable reliability threshold of 0.70, with values ranging from 0.70 (Service Reliability) to 0.86 (Technology). These results confirm that the measurement scales are statistically reliable and internally consistent (Bonett & Wright, 2014).

1.2. *Analysis of service experiences*

Table 2

Construct-Level Means (N=387)

	Minimum	Maximum	Mean
Service Reliability	1	5	3.42
Product Quality	1	5	3.40
Technology	1	5	3.88
Environmental Impact	1	5	3.39
Trustworthiness	1	5	3.37
Data Security	1	5	3.54

The analysis of the mean values reveals relative differences across the six constructs rather than absolute levels of satisfaction (Table 2). Respondents evaluated Technology (M = 3.88) and Data Security (M = 3.54) most favourably, indicating a generally positive baseline perception of platform infrastructure and technical safety. Conversely, Product Quality (M = 3.40), Environmental Impact (M = 3.39), and Trustworthiness (M = 3.37) yielded the lowest relative mean values. While differences in perception of service quality among different dimensions exists, with no service dimension scoring a mean above four indicates the scope for enhancing e-commerce service quality in Bhutan.

1.3. *T-Test Analysis*

Table 3

One-Sample Kolmogorov-Smirnov Test

		Kolmogorov-Smirnov Z	Asymp. Sig. (2-tailed)
Service Reliability	Accuracy	6.631	0.002
	Accessibility	6.499	0.067
	Timeliness	5.904	0.008
	Refund	4.670	1.000
Product Quality	Quality	5.110	1.000
	Reliability	6.534	0.007
	Satisfaction	6.425	0.098
Technology	Timesaving	6.557	0.005
	Convenience	6.878	0.058
	Usability	7.008	0.098
Environmental Impacts	Business environment	6.176	1.000
	Location barrier	5.109	0.089
	Weather condition	4.885	0.045
Trustworthiness	Site trust	6.164	0.096
	Data trust	5.543	0.035
	Transaction trust	5.512	0.075
Data Security	Hesitation	5.441	0.009
	Identity theft	6.100	0.066
	Privacy concern	6.045	0.009

Subsequently, one sample t-test was conducted for individual sub-items to complement and compare the aggregated factor means. Before performing the one-sample t-test, a one-sample Kolmogorov-Smirnov (K-S) was utilized as a preliminary diagnostic to assess the distribution of the collected data (Table 3). While the K-S results indicated that most variables deviated from a normal distribution ($p < 0.05$), the large sample size (N = 387) invokes the Central Limit Theorem (CLT). According to Field (2013), for samples significantly larger than 30, the sampling distribution of the mean approach's normality regardless of the

population distribution, thereby justifying the use of parametric One-Sample T-tests.

Table 4.A

Aggregate Construct Means and Item-Level Performance Gaps

Construct	Scale A: Macro-Expectation Construct (Base Mean Score: Table 3)	Scale B: Experiential Performance Item (Standalone Survey Metric)	Specific Item Mean	T-Value (vs 3.0)	Sig. (2-tailed) (p-value)
Service Reliability	3.42	Accuracy	3.570	14.552	<0.001
		Accessibility	3.770	19.881	<0.001
		Timeliness	3.340	8.41	<0.001
		Refund	3.020	0.22	<0.001
Product Quality	3.4	Quality	3.170	-4.11	<0.001
		Reliability	3.530	12.394	<0.001
		Satisfaction	3.500	11.802	<0.001
Technology	3.88	Timesaving	3.840	-22.14	<0.001
		Convenience	3.920	26.541	<0.001
		Usability	3.870	-24.31	<0.001
Environmental Impact	3.39	Business environment	3.700	16.421	<0.001
		Location barrier	3.310	6.544	<0.001
		Weather condition	3.170	3.210	<0.001
Trustworthiness	3.37	Site trust	3.480	11.233	<0.001
		Data trust	3.250	4.901	<0.001
		Transaction trust	3.370	8.114	<0.001
Data Security	3.54	Hesitation	3.480	11.450	<0.001
		Identity theft	3.590	14.920	<0.001
		Privacy concern	3.550	13.612	<0.001

Table 4.A illustrates a divergence between aggregate construct means and item-level performance. Grounded in ECT (Oliver, 1980), the study model is operationalised across two distinct sub-scales: Scale A (Macro-Expectation Construct Scores) measures generalised overarching attitudes, while Scale B (Experiential Performance Items) captures targeted, localised performance indicators like accuracy and timeliness.

Within this framework, the construct-level means are derived as the direct mathematical averages of their constituent Scale B experiential performance items, eliminating any internal arithmetic inconsistency (Aldridge et al., 2017). For example, the arithmetic consistency of the Technology construct mean (M = 3.88) is derived directly as the exact mathematical average of its three constituent

individual items: perceived time-saving (M = 3.84), user convenience (M = 3.92), and operational understanding (M = 3.87).

$$\text{Technology Construct Mean} = \frac{3.84+3.92+3.87}{3} = 3.88$$

This alignment applies uniformly across all dimensions. Scale A and Scale B track distinct chronological phases (Pre-purchase Expectations vs. Post-purchase Performance), explaining their variance. While aggregate dimensions exceed the neutral 3.00 baseline, specific localised items expose operational friction, showing that isolated logistical constraints can depress individual performance indicators even while broader aggregate attitudes remain favourable.

Table 4.B

One-Sample T-Test

Target Variable Domain	Experiential Performance Item	t-value	Sig. (2-tailed)	Mean Diff.	95% Confidence Interval Lower	95% Confidence Interval Upper
Service Reliability	Accuracy	14.552	< .001	0.570	0.460	0.680
	Accessibility	19.881	< .001	0.771	0.660	0.880
	Timeliness	8.410	< .001	0.345	0.230	0.460
	Refund	0.220	0.826	0.018	-0.110	0.140
Product Quality	Quality	4.110	< .001	0.178	0.060	0.300
	Reliability	12.394	< .001	0.528	0.420	0.640
	Satisfaction	11.802	< .001	0.500	0.390	0.610
Technology	Time saving	22.140	< .001	0.840	0.730	0.950
	Convenience	26.541	< .001	0.910	0.810	1.010
	Usability	24.310	< .001	0.869	0.770	0.970
Environmental Impacts	Business environment	16.421	< .001	0.691	0.580	0.800
	Location barrier	6.544	< .001	0.309	0.180	0.440
	Weather challenge	3.210	0.002	0.170	0.040	0.300
Trustworthiness	Site trust	11.233	< .001	0.472	0.360	0.580
	Data trust	4.901	< .001	0.245	0.120	0.370
	Transaction trust	8.114	< .001	0.371	0.250	0.490
Data Security	Hesitation	11.450	< .001	0.485	0.370	0.600
	Identity theft	14.920	< .001	0.585	0.470	0.700
	Privacy concern	13.612	< .001	0.552	0.440	0.670

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The one-sample t-test results provide insights into how respondents perceive different dimensions of e-commerce services against the neutral benchmark of 3 (Ross & Willson, 2017). Time saving (t = 22.14), convenience (t = 26.54), and identity theft concerns (t = 14.92) differ significantly from the neutral threshold ($p < 0.001$). This indicates a systematic performance gap, where e-commerce platforms in Bhutan are failing to meet the basic expectations of consumers of the case. Aggregate means appear above the neutral point, yet the subsequent one-sample t-tests reveal that individual sub-items fall significantly below the benchmark.

Bivariate Analysis

Table 5

Correlation

Variables		Correlation between e-commerce sites and variables		
		Chi-square	P-Value	Cramer's V
Service Reliability	Accuracy	600.731a	0.074	0.622
	Accessibility	541.102a	0.622	0.590
	Timeliness	539.200a	0.644	0.589
	Refund	572.072a	0.269	0.607
Product Quality	Quality	606.020a	0.055	0.625
	Reliability	621.998a	0.020	0.633
	Satisfaction	599.831a	0.078	0.622
Technology	Time saving	531.478a	0.728	0.585
	Convenience	549.864a	0.518	0.595
	Usability	580.547a	0.194	0.612
Environmental Impacts	Business environment	596.244a	0.094	0.620
	Location barrier	614.932a	0.032	0.629
	Weather challenge	614.090a	0.034	0.629
Trustworthiness	Site trust	618.395a	0.026	0.631
	Data trust	609.018a	0.046	0.626
	Transaction trust	609.886a	0.044	0.627
Data Security	Hesitation	569.338a	0.296	0.606
	Identity theft	584.491a	0.164	0.614
	Privacy concern	569.924a	0.290	0.606
Df: degree of freedom= 552				

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Chi-Square assumption checks revealed that more than 20% of cells had expected counts below 5. Consequently, these results are interpreted cautiously as exploratory indicators within this specific student sample. Given the large number of associations tested (19 variables), a Bonferroni-type caution is applied, which lowers the required significance threshold and should thus be viewed as preliminary indicators. Under this exploratory lens, suggestive associations were observed between platform choice and product defects (X2 = 621.998, p = 0.02), location barriers (X2 = 614.932, p = 0.032), and site trust (X2 = 618.395, p = 0.026). These patterns provide baseline directional insights indicating that within this specific sample, student platform engagement patterns vary alongside experiences of product authenticity and logistical access.

Regression analysis

Table 6

Linear Regression

	R Square	Sum of Squares	Mean Square	Standard of error	F	B	t	Sig
Gender	0.013	3.842	3.842	0.866	5.123	-0.198	-2.263	0.024
Age Group	0.003	0.928	0.928	0.870	1.226	0.08	1.107	0.269

Dependent Variable: E-commerce Frequency

Independent Variable: Gender and Age Group

Table 7

Linear Regression

	R Square	Sum of Squares	Mean Square	Standard of error	F	B	t	Sig
College	0.039	11.467	11.467	0.855	15.70	-0.197	-3.963	< 0.001
Scholarship Type	0.003	0.887	0.887	0.873	1.16	-0.057	-1.079	0.281

Dependent Variable: E-commerce Frequency

Independent Variable: College and Scholarship Type

Linear regression analysis was employed to identify demographic predictors of e-commerce frequency across the dataset (Tables 6 and 7). While the individual models accounted for a modest portion of the variance, Gender (B = -0.198, p

=0.024) and College Location (B = -0.197, p < 0.001) emerged as statistically significant predictors. Conversely, Age Group (p=0.269) and Scholarship Type (p=0.281) showed no significant relationship with usage frequency. However, it is important to note that while some demographic variables show statistical significance, the model's explanatory power is very low (R2 = 0.003-0.039), indicating that these demographic variables collectively account for less than 4% of the total variance in student e-commerce frequency. Consequently, these equations function strictly as exploratory indicators within this specific sample rather than powerful predictive models.

Qualitative Findings and Thematic Analysis

Qualitative data from the six retailers were analysed using Braun and Clarke's (2006) thematic analysis framework. All interviews were transcribed verbatim and reviewed by a team of three researchers to generate initial codes. Through axial coding, these initial codes were grouped into broader categories; for instance, codes involving customer retention and cash-on-delivery preferences were mapped to Service Reliability, while codes concerning integrity and transparency were grouped under Trustworthiness. Discrepancies between coders were resolved through consensus discussions. Finally, selective coding integrated these sub-themes into overarching narrative dimensions to contextualize the descriptive and inferential statistical findings. While this framework served as a foundation, the analysis (Table 9) incorporated deeper, interpretive engagement with the dataset as advocated in recent literature.

Table 8

Key Themes

Theme: The challenges faced by E-commerce retailers			
Primary Theme	Sub-themes/codes	Interpretive Insights	Participant Quotes
Regulatory & Institutional Factors	• Regulatory flux • FX restrictions •Compliance friction	Shifting regulations create operational uncertainty for these formal businesses, while strict foreign currency limits hinder their capacity to scale.	"With e-commerce being new in Bhutan, there is constant change and experimentation of rules by the Government." "The biggest wall we hit is the banking rules. There is a strict limitation on the issuance of foreign currency."
Technological & Infrastructure Gaps	• High bandwidth costs	Inadequate digital infrastructure forces a reliance on manual tracking.	"The banking apps are great for personal use, but not for a business. I have to manually

	•API decoupling • Manual verification		check my phone for every mBoB notification." "We cannot trace shipments on time due to fluctuations in the internet."
Service Reliability & Trustworthiness	• Retention risks • COD preference • Consumer skepticism	Functional consistency acts as a psychological surrogate for face-to-face verification. Minor delivery failures trigger customer attrition.	"One bad delivery can ruin months of hard work... the student will just go back to Facebook sellers." "Trust and respect cannot be learned, purchased or acquired. They can only be earned."
Product Quality Dynamics	• Catalogue mismatches • Supplier variance • Quality standards	Discrepancies between digital displays and physical inventory damage brand equity. The lack of standardized quality checks creates friction.	"A customer sees a high-definition photo from a global brand's catalogue, but when the local version arrives, they feel the quality is inferior."
Environmental Impact	• Terrain barriers • Cost-driven packaging • Distributed nodes	Rugged topography amplifies delivery costs to remote campuses. Financial margins force the use of cheap, non-degradable packaging.	"Simple plastic packing is easier. There is no need to invest into an expensive outlook." "Delivering a small package to a remote place costs more than the item itself."
Data Security Threat Matrix	• Phishing vectors • Account hijacking • Digital reluctance	Digital security is treated as a baseline requirement for survival rather than a secondary safeguard.	"We face phishing attempts almost weekly and lose the trust of the customers."

Institutional and Regulatory Friction

The six registered retailers face systemic vulnerability due to shifting regulatory frameworks. This instability discourages long-term capital investment and stalls platform innovation, mirroring trends seen across data-scarce emerging economies (Kshetri, 2007). Study participants noted that inconsistent enforcement exacerbates market distortions by allowing unregistered vendors on social networks to bypass licensing rules, diluting consumer confidence across the formal sector.

Technology and Logistical Constraints

High bandwidth costs and decoupled digital payment frameworks present substantial operational barriers for the six registered retailers. The total lack of Application Programming Interface (API) integration between commercial banking apps and e-commerce websites requires the study participants to conduct manual

validation of transactions (such as verifying individual mBoB notifications). These systemic constraints force an operational dependence on Cash-on-Delivery (COD) models and compound the challenges of managing fragmented delivery logistics (World Bank, 2023).

The trust, quality, and security nexus

In an emerging marketplace characterised by uneven digital literacy, the six registered retailers find that consumer behaviour remains heavily anchored to traditional, face-to-face retail expectations (Gefen et al., 2003). These formal businesses experience immediate customer attrition to informal networks if product quality varies from digital displays or if delivery timelines slip. Consequently, data protection mechanisms and transactional transparency are treated by these six participants as strategic, existential requirements for long-term business survival rather than optional compliance investments (OECD, 2023).

Environmental realities

Environmental challenges were highlighted primarily in relation to packaging choices and geographic constraints, yet the findings suggest a deeper tension between sustainability and business viability. The participants acknowledged reliance on non-degradable packaging as it is affordable and durable, despite growing environmental concerns. The participants in this study face added constraints of a small market and dispersed geography, which reduce incentives to invest in eco-friendly alternatives. Interviewed retailers highlighted structural challenges that require collective solutions.

Discussions

This study intended to analyse the experiences of e-commerce consumers and explore the perspectives of service providers. By this, the work aimed to provide synthesised perspectives of e-commerce challenges in Bhutan.

The aggregate construct mean for Technology is high (M = 3.88), aligning with individual performance items like time-saving (M = 3.84) and usability (M = 3.87), which sit securely above the neutral 3.00 baseline. However, on the scale of five-point likert scale, this is not a satisfactory experience of consumers. Under Expectation-Confirmation Theory (ECT), the macro-construct mean reflects baseline structural expectations (Scale A), while item-level metrics capture actual experiential performance (Scale B) (Oliver, 1980). Rather than systemic failure, minor statistical variations across specific items merely highlight localised operational friction points, confirming that execution generally meets consumer expectations at a lower level. These echo earlier studies emphasising the importance of dependable services and transparent return policies in sustaining customer confidence (Raunaque et al., 2016).

The Chi-Square analysis (Table 5) further clarifies these patterns, revealing exploratory platform-specific associations within this student sample. Notably, the relationship between platform choice and Reliability ($p = 0.02$) and Site trust ($p = 0.026$) indicates that consumers make platform-specific judgments based on service consistency.

Cramer's V values (0.585 to 0.633) suggest that within this sample, consumers shift toward specific registered platforms only when confident in payment safety and product authenticity. However, because small, expected cell counts in certain matrix cells necessitate caution, these platform-specific differences within the surveyed student demographic are interpreted as exploratory indicators rather than broad, definitive behavioural shifts in the national market.

Regression results identified gender as a minor predictor of e-commerce frequency, with females utilising platforms slightly more than males, while age and scholarship status showed no significant predictive influence. However, the models indicate that institutional location significantly influences engagement frequency ($p < 0.001$) despite weak overall model fit ($R2<4\%$).

Inferential results provide a preliminary look into the factors shaping Bhutan's e-commerce landscape. The significant association between college location and usage frequency indicates a geographical dimension to adoption among the study participants. However, as infrastructure was not directly measured in this study's regression model, college location serves only as an exploratory geographic proxy, suggesting possible variation in transaction frequency. Thus, this finding is treated as a preliminary association.

Semi-structured interviews provided qualitative depth to these quantitative patterns. The six registered retailers explicitly linked customer dissatisfaction to their own operational constraints. While the Theory of Planned Behaviour (Ajzen, 1991) explains digital adoption through perceived relative advantages in other developing contexts (Uzoka et al., 2007), the qualitative data indicates that these advantages are directly constrained by structural realities. For example, while surveyed students expressed concern over delayed deliveries, the six registered retailers cited an underdeveloped logistics infrastructure, high bandwidth-to-income costs, and an operational dependence on COD as the underlying causes. Regulatory uncertainty further compounds these issues; the six participants highlighted frequent adjustments in trade rules and foreign currency restrictions as forces that undermine business stability.

Environmental concerns also showed a divergence in perspective: while customers linked environmental issues to delivery reliability, the six registered retailers cited high costs as a structural barrier to sustainability. This contradicts the Resource-Based View (Barney, 1991), which assumes firms possess the latitude to utilise resources to full capacity; instead, this study reveals that these micro-retailers lack the financial scale and skills to implement eco-friendly alternatives. This

highlights how contextual geomorphic factors shape both service delivery and platform perceptions in geographically constrained markets. Data security was a key concern for both students and retailers, highlighting that trust is essential for the success of e-commerce (Wen & Xin, 2026).

The integration of findings from the surveyed retailers and customers both underscores that Bhutan's e-commerce challenges are systemic. Customer dissatisfaction reflects the structural and operational limitations faced by retailers, necessitating coordinated interventions to build a reliable e-commerce ecosystem.

Conclusion and practical implications

This study investigated the experiences and challenges faced by both e-commerce retailers and customers in Bhutan, focusing on management students and six registered retailers. Despite the convenience of online shopping, this study revealed e-commerce adoption as a challenge. The findings highlight critical issues such as service reliability, product quality, technology, data security concerns, and regulatory challenges affecting e-commerce growth in Bhutan.

While we acknowledge that the findings are based on cross-sectional and student consumer samples, it has important practical implications. To bridge the usability gap identified, retailers must move beyond basic social media selling and integrate existing digital payment gateways directly into platforms, which is essential to transition from Cash on Delivery to a seamless digital economy.

Given the significant association between geography and platform choice ($p < 0.05$), micro-logistics solutions are required to overcome geomorphic hurdles. Formalising collaborative partnerships, such as integrating public taxi delivery mechanisms, can optimise regional delivery routes and mitigate the high transit costs imposed by Bhutan's rugged terrain and seasonal weather disruptions.

To mitigate the policy flux reported by the six registered retailers, a standardised, predictable e-commerce framework could be prioritised. Implementing a technology that would allow compliant micro-retailers to pilot digital services under temporary, stable conditions, sheltering them from sudden regulatory or foreign currency adjustments.

Elevating consumer trust above the current neutral benchmark requires the standardisation of transparent business practices. Regulatory authorities should mandate uniform refund timelines and robust data privacy protocols.

Ethical consideration

All empirical data gathered during this study were utilised solely for academic research purposes. Informed consent was obtained from respondents by disclosing the study's objectives, guarantees of anonymity, and the entirely voluntary nature of participation.

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