



Journal of Consumer Behavior, Marketing, and Management (JCBMM)

VOLUME 2 ISSUE 1 (2026)



PUBLISHED BY
E-PALLI PUBLISHERS, DELAWARE, USA

Mapping Cause–Effect Relationships Among Factors Influencing Online Shopping Behavior in Nepal Using DEMATEL

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Article Information

Received: September 29, 2025

Accepted: November 03, 2025

Published: March 14, 2026

Keywords

Consumer Behavior, Delivery, DEMATEL, E-commerce, Online shopping, Trust

ABSTRACT

In recent years, people in Nepal have started buying more things online instead of visiting stores. This change has been made faster by platforms like Daraz, which help customers shop easily from home. Because of this trend, it is important to understand what factors affect people's decisions when they shop online. This study tries to find out which things matter most to online shoppers in Nepal. To do this, the researcher used a method called DEMATEL (Decision-Making Trial and Evaluation Laboratory). It helps to see how different factors are connected and how one factor can affect another. A total of 17 experts who have experience in e-commerce were asked to give their opinions. They looked at factors like Price, Trust, Delivery, Influencer Marketing, and Return and Refund Policy. After studying the data, the results showed that Trust and Delivery are the most important factors. When customers trust the website and get their products delivered on time, they are more likely to shop again. These two factors also influence other things like price and refund policies. On the other hand, Influencer Marketing (social media promotions) was found to depend on other factors and does not strongly affect decisions by itself. Overall, this research helps to understand how Nepali customers think while shopping online. It also gives useful ideas to online businesses like Daraz to improve customer satisfaction and loyalty. The DEMATEL method used in this study makes it easier to see the links between different factors and can help future researchers study online shopping behaviour in a clear and simple way.

INTRODUCTION

In today's society, technology has altered how people buy and sell goods. Many people now choose to shop online because it is convenient, quick, and provides a variety of options. They may search for products, compare prices, and place orders from home without having to go to a store. In Nepal, this transformation has been accelerated by online shopping sites such as Daraz, one of the country's largest e-commerce platforms. As more individuals begin to buy things from such websites, it becomes critical to understand why they choose to shop online and what variables influence their selections. Researchers and business experts are currently working to better grasp these causes. Online shopping has expanded rapidly around the world as a result of the widespread use of the internet, cell phones, and online payment methods. The same trend can be seen in Nepal, where e-commerce is helping to boost the economy while also connecting people from rural and urban areas to new markets. However, considering these possibilities, not everyone in Nepal is benefiting equally from the expansion of internet shopping. Some people are eager to adopt internet platforms, while others prefer traditional shopping. This disparity occurs because a variety of factors, including trust, technology, habits, and income levels, all interact to determine how people use internet purchasing in their daily lives.

Trust and perceived security play a significant role in consumers' online shopping decisions (Singh &

Weinberger, 2021; Bhujel, 2024). Consumers in Nepal frequently express concerns about data privacy, product legitimacy, and the dependability of digital payment systems, making trust-building an urgent need for e-commerce providers (Khadka, Adhikari, & Sharma, 2025). Furthermore, convenience, which includes simplicity of website navigation, time-saving benefits, and the availability of different product offerings, influences consumer decisions (Jaiwant, 2020; Lim *et al.*, 2016). Price sensitivity remains a crucial element, with digital customers actively seeking competitive pricing and promotional offers in developing countries due to lower average income levels and high price awareness (Khadka *et al.*, 2025; Malla, 2018).

Expert suggestions, family counsel, online reviews, and social media endorsements are extremely influential, especially among younger, more engaged digital customers (Sharma & Adhikari, 2023; Swapana, 2017). Customer satisfaction and loyalty are also influenced by the quality of customer service, which includes prompt response to inquiries and after-sales support, as well as solid logistical frameworks for timely delivery (Abdullah *et al.*, 2020; Khadka *et al.*, 2025; Malla, 2018). The adoption curve is influenced by infrastructure factors such as internet connectivity, digital literacy, and the availability of localized payment options, all of which reflect Nepal's unique technological and demographic context.

To properly analyse these interconnected aspects and clarify their causal links, the Decision-Making Trial and

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Evaluation Laboratory (DEMATEL) method provides a comprehensive analytical framework. DEMATEL enables researchers to create and display a network of cause-effect relationships between variables, revealing which elements are major drivers and which are consequential effects (Si *et al.*, 2018; Abdullah *et al.*, 2020). This method's ability to combine both expert opinion and quantitative data at the same time makes it ideal for investigating the multifactorial dynamics of online shopping behaviour (Cheng *et al.*, 2022; Xi *et al.*, 2023). Implementing DEMATEL in the Nepalese e-commerce context promises to deliver contextually rich information, assisting firms and policymakers in prioritizing strategic initiatives such as increasing trust mechanisms, improving logistics, and optimizing digital and social marketing. In simple terms, the goal of this study is to use DEMATEL to map the intricate cause-and-effect linkages between major factors impacting online buying behaviour in Nepal. This attempt helps to close the scholarly gap in emerging market-specific e-commerce habits while also providing practical recommendations to stakeholders looking to create a robust, inclusive, and consumer-friendly digital marketplace in Nepal and other developing countries.

Statement of Problem

Online shopping is becoming very popular in Nepal as more people use e-commerce platforms. But it is still not clear what exactly makes customers decide to buy online. People's choices are influenced by a variety of elements, including pricing, product quality, trust, delivery speed, and website design, which are frequently interconnected in complex ways. Most previous studies examined these characteristics independently, without demonstrating how they interact. As a result, Nepalese internet firms struggle to determine which areas to prioritize in order to increase client satisfaction and loyalty. To address this issue, this work employs a technique known as DEMATEL. This strategy can help determine not just which factors are significant, but also which cause changes in others. Understanding these linkages can help internet businesses make better decisions and enhance overall performance.

Research Objectives

To find out the main factors that influence how customers make their online shopping decisions in Nepal.

To understand how these factors are connected to each other by using the DEMATEL method, and to identify which factors create an effect and which ones are influenced by others.

LITERATURE REVIEW

The investigation of purchasing habits online has received a lot of scholarly attention, thanks to the tremendous growth of e-commerce around the world, particularly in emerging economies like Nepal. Extensive research has revealed a diverse set of factors that influence customer decisions and behaviours in the digital economy. Convenience appears to be an important factor,

indicating that consumers choose to save time and effort by purchasing items online rather than in traditional retail stores (Jaiwant, 2020; Lim *et al.*, 2016; Khadka, Adhikari, & Sharma, 2025). Consumers frequently express worries about payment security, product validity, and data privacy while making online transactions (Bhujel, 2024; Swapana, 2017; Sharma & Adhikari, 2023; Singh & Weinberger, 2021). Price competitiveness, including discounts and transparent pricing techniques, has a significant impact on purchase intentions, especially in price-sensitive sectors (Jaiwant, 2020; Khadka *et al.*, 2025; Malla, 2018). Social influence, which includes referrals from family and friends as well as peer evaluations, has been shown to boost customer confidence and e-commerce adoption among younger demographics and tech-savvy consumers (Sharma & Adhikari, 2023; Khadka *et al.*, 2025; Swapana, 2017). Website quality characteristics such as usability, product information richness, and mobile compatibility all have a significant impact on the shopping experience and consumer satisfaction (Abdullah *et al.*, 2020; Si *et al.*, 2018; Cheng *et al.*, 2022).

Advanced analytical tools, particularly the Decision-Making Trial and Evaluation Laboratory (DEMATEL) method, have gained popularity for determining the causal linkages and interdependence between these numerous components. Si *et al.* (2018) present a thorough assessment of DEMATEL's use in consumer behaviour research, focusing on its usefulness in discriminating between cause-and-effect elements. Abdullah *et al.* (2020) and Cheng *et al.* (2022) show how DEMATEL enables a more complex understanding of how trust, logistical efficiency, and customer service quality serve as both direct influencers and mediators, influencing other aspects in the purchasing ecosystem.

Integrating DEMATEL with other methodologies, such as Analytic Network Process (ANP) and Interpretive Structural Modelling (ISM), has improved the robustness and practicality of e-commerce strategy design (Xi *et al.*, 2023; Cheng *et al.*, 2022; Si *et al.*, 2018).

In Nepal, research efforts confirm worldwide findings while stressing local aspects such as infrastructure constraints, digital literacy, and cultural factors influencing online consumer behaviour (Malla, 2018; Bhujel, 2024; Khadka *et al.*, 2025).

Price sensitivity and payment systems, including preferences for cash-on-delivery and mobile wallets, are seen as crucial to overcoming trust deficiencies and increasing market penetration (Bhujel, 2024; Swapana, 2017; Khadka *et al.*, 2025). Furthermore, in Nepalese online marketplaces, corporate reputation, efficient delivery services, and prompt after-sales support are crucial for encouraging repeat purchases and long-term consumer loyalty (Malla, 2018; Khadka *et al.*, 2025; Sharma & Adhikari, 2023).

Digital marketing strategies, emotional brand ties, and data security concerns are all evolving focus points that influence online purchasing attitudes and habits. Empirical studies show that these traits, coupled with smart website

design and integrated social media engagement, are critical for building trust and inspiring consumers in rising digital economies (Bhujel, 2024; Sharma & Adhikari, 2023; Swapana, 2017; Singh & Weinberger, 2021). This study corpus highlights the significance of localized, culturally sensitive, and technologically adaptable e-commerce strategies.

Overall, current research suggests that online shopping behaviour in Nepal is driven by a complex interplay of technological, social, psychological, and infrastructure aspects. Using DEMATEL to map the cause-and-effect relationships between these variables has the potential to provide actionable insights for academics, marketers, and policymakers interested in improving consumer experience and expanding digital commerce inclusivity in Nepal and other emerging markets (Abdullah *et al.*, 2020; Cheng *et al.*, 2022; Xi *et al.*, 2023; Si *et al.*, 2018).

Rationale for Using DEMATEL

The DEMATEL method is used in this study because it helps to find out how different factors affect each other in online shopping. It shows which factors act as the main causes and which ones are the results. This makes it easier for online businesses to know what really drives customer behaviour and how they can improve the shopping experience. Earlier studies also show that price plays a big role in online buying. For example, Jadhav and Khanna (2016) found that low prices attract many college students, and Akar and Nasir (2015) explained that competitive prices increase customers' trust and willingness to buy. The DEMATEL method helps to check whether price works alone or together with other factors.

Trust is another important part of online shopping. Sivanesan (2020) mentioned that people trust a website more when they feel safe with online payments and product quality. Similarly, Mani and Chouskey (2022) found that trust affects how customers feel about delivery, return policies, and overall satisfaction. Using DEMATEL helps to see whether trust is the main cause or an effect of these other factors.

The study also looks at the role of social media and influencers. According to Sinha and Kim (2023), influencer marketing can shape people's opinions and encourage them to shop online. DEMATEL helps to understand if influencer marketing directly affects buying decisions or works through other factors. The same researchers also found that easy return and refund options make customers more confident. When buyers feel safe knowing they can return a product, they are more likely to try online shopping. DEMATEL helps to see how these return and refund policies influence customers' decisions.

Conceptual framework

This study is grounded in the theoretical premise that the factors of Price, Trust, Delivery, Influencer Marketing, and Return & Refund Policy are interconnected within a system that influences online consumer decision-making. While the nature and direction of these relationships are to be determined empirically, existing literature (e.g.,

Mani & Chouskey, 2022; Sinha & Kim, 2023) suggests that complex interdependencies exist. The DEMATEL method is employed precisely to move beyond this theoretical proposition and to quantify the precise cause-effect structure of this system.

MATERIALS AND METHODS

Research Design

This study uses a causal modeling approach based on the Decision-Making Trial and Evaluation Laboratory (DEMATEL) technique. DEMATEL is a comprehensive method for developing and accessing structural models that include causal interactions between complicated factors (Fontela & Gabus, 1976). The design entailed gathering expert perspectives on the pairwise influence of five preset important criteria influencing online shopping behaviour in Nepal: price, trust, delivery, influencer marketing, and return and refund policy. This approach is chosen for its capacity to convert qualitative expert assessments into quantifiable data, map the interrelationships, and classify the factors into cause-and-effect groups, thus offering a clear knowledge of the system's structure.

Selection of Experts

The DEMATEL technique depends on experts' knowledge and experience to make informed decisions about the relationships between variables. For this study, data were gathered from a panel of 17 experts chosen using purposive sampling, a non-probability selection technique in which participants are chosen based on their specialized experience and knowledge of the research subject. The expert panel included people with extensive experience in Nepal's e-commerce and digital marketing sectors.

Data Collection Instrument and Procedure

The major data gathering tool was a structured pairwise comparison survey, precisely constructed to obtain the expert judgments required for DEMATEL analysis. This instrument included a 5x5 matrix with the five identified parameters Price, Trust, Delivery, Influencer Marketing, and Return & Refund Policy displayed on both the horizontal and vertical axis. Experts were told to assess the direct influence of each row factor on each column factor using a preset five-point integer scale, with 0 representing "No influence," 1 representing "Low influence," 2 representing "Medium influence," 3 representing "High influence," and 4 representing "Very high influence." To ensure that all respondents had a uniform and correct knowledge of each concept, the survey began with clear, operational definitions and contextual examples relevant to Nepal's e-commerce scene for each element.

The data was collected in person by the researcher during a set period. This strategy was adopted carefully to ensure a 100% response rate from the purposefully selected expert panel while also improving the data's quality and trustworthiness. During each scheduled meeting, the

researcher provided a comprehensive explanation of the research objectives and detailed instructions on how to complete the pairwise comparison matrix. The presence of the researcher enabled the prompt clarification of any uncertainties, ensuring that the experts' decisions were informed and consistent. This direct, hands-on approach ensured the completeness and correctness of all 17 gathered surveys, which were then collated to generate the initial direct relation matrices that served as the foundation for the future DEMATEL study.

Data Analysis Technique (The DEMATEL Method)

The data was analysed using the Decision-Making Trial and Evaluation Laboratory (DEMATEL) approach, which converted expert judgments into a quantitative model of causal interrelationships between factors influencing online shopping behaviour. The technique identifies important influencing elements and maps their direct and indirect relationships within a system.

Step 1: Construction of the Direct-Relation Matrix

Responses from 17 experts were aggregated to form the initial direct-relation matrix (A), where each element a_{ij} denotes the average influence of factor i on factor j as rated by the experts:

$$A = [a_{ij}], i, j = 1, 2, \dots, n.$$

Since a variable does not influence itself directly, all diagonal elements satisfy $a_{ii} = 0$.

Step 2: Normalization of the Direct-Relation Matrix

To ensure all elements are scaled between 0 and 1, the matrix A was normalized using the largest row sum:

$$X = \frac{A}{\max_i \sum_{j=1}^n a_{ij}}$$

where $X = [x_{ij}]$ is the normalized direct-relation matrix. This step guarantees convergence in subsequent matrix operations and standardizes influence magnitudes.

Step 3: Computation of the Total-Relation Matrix

The Total-Relation Matrix (T) integrates both direct and indirect effects among all factors. It is computed using the following equation:

$$T = X(I - X)^{-1}$$

where I is the identity matrix of order n. Each element t_{ij} in matrix T represents the total influence (direct + indirect) that factor i exerts on factor j.

Step 4: Threshold Determination

To filter out minor and statistically insignificant connections, a threshold value (α) was calculated as the mean of all elements in the total-relation matrix:

$$\alpha = \frac{1}{n^2} \sum_{i=1}^n \sum_{j=1}^n t_{ij}$$

Only those relationships satisfying $t_{ij} > \alpha$ were retained for the final interpretation. In this study,

$\alpha = 2.034$, which means that only influences stronger than 2.034 were considered meaningful in the causal network.

Step 5: Determination of Prominence and Net Effect

To classify each factor as a cause or effect, the sum of rows and columns of the total-relation matrix were

calculated as:

$$R_i = \sum_{j=1}^n t_{ij}, \quad C_i = \sum_{j=1}^n t_{ji}$$

Here:

R_i denotes the total influence given by factor i (how much it affects others);

C_i denotes the total influence received by factor i (how much it is affected by others).

Two further indicators are derived:

■ (&”Prominence: “ $(R_i + C_i)$, “Net Effect: “ $(R_i - C_i)$.”

A positive $(R_i - C_i)$ indicates that factor i is a net cause, meaning it exerts more influence than it receives.

A negative $(R_i - C_i)$ signifies that factor i is a net effect, meaning it is predominantly influenced by other variables. This mathematical categorization enables the objective identification of key driving and dependent factors within the online shopping system.

Step 6: Causal Network Visualization

A cause-effect network diagram (digraph) was created using the computed findings, with directional arrows indicating relationships when $t_{ij} > \alpha$. The resulting figure visibly distinguishes between cause elements (such as Trust and Delivery) and effect factors (Price, Influencer Marketing, and Return & Refund), revealing the system’s hierarchical influence structure.

Ethical Considerations

This study followed strict ethical criteria throughout its execution. Before participating, all experts involved in the research provided informed consent. The procedure was thoroughly described, emphasizing that their involvement was entirely voluntary and that they might quit at any time without repercussions. To guarantee the experts’ confidentiality and anonymity, all replies were collected and evaluated without using any personal identifiers. The data was used purely for this academic research, and the results are presented in an aggregated way to ensure that no individual’s input can be tracked or identified. These steps were put in place to ensure the greatest level of ethical integrity while also protecting the rights and well-being of all participants.

Data Analysis and Findings

This section summarizes the findings of the Decision-Making Trial and Evaluation Laboratory (DEMATEL) analysis of the factors influencing online purchase decisions in Nepal. The analysis includes the building of a Total Relation Matrix, computation of cause-and-effect links, and display via a network diagram. Total Relation Matrix (TRM): The TRM shows the direct and indirect effects of one component on another. Larger values suggest a stronger influence. After applying a threshold value of 2.034, only meaningful associations were kept for analysis.

The complete relation matrix results demonstrate the interdependence of the elements impacting online

Table 1: Total Relation Matrix (T) Before Applying Threshold.

Criteria/Factors	Price	Trust	Delivery	Influencer	Return and
Refund					
Price	2.012388	2.147268	1.682701	1.934402	2.172514
Trust	2.410613	2.117968	1.842563	2.084292	2.327567
Delivery	2.349993	2.297331	1.633741	2.019027	2.285766
Influencer	1.973096	1.921012	1.529653	1.569104	1.941983
Return and Refund	2.162231	2.110779	1.631226	1.863864	1.909756

purchasing decisions. Trust emerges as a major driver, with a significant impact on both Price (2.41) and Return & Refund (2.33), implying that customer confidence directly influences views of pricing justice and post-purchase security. Similarly, Delivery has a substantial causal effect, influencing Price (2.35), Trust (2.30), and Return & Refund (2.29).

This suggests that quick delivery services are critical for establishing consumer trust and affecting overall value perception. Furthermore, price has a significant

impact on trust (2.15) and return and refund (2.17), demonstrating how competitive pricing tactics can boost customer confidence and expectations of fair after-sales treatment. Influencer marketing plays a secondary role in consumer decision-making compared to fundamental functional criteria like trust, delivery, and price, as seen by the relatively weak associations (all < 2.0). (See Table 1) Cause–Effect Network Diagram

The table shows cause-effect analysis gives a clear structural model of the decision-making system,

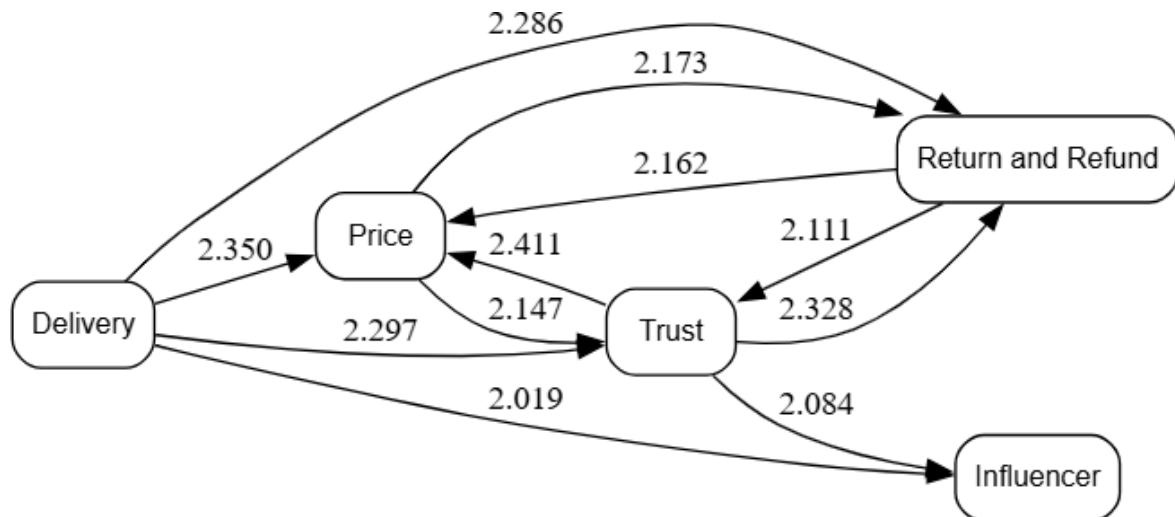


Figure 1: The cause–effect diagram illustrates the directional influences among factors. Arrows indicate significant relationships (values above the threshold of 2.034).

Table 2: Cause and Effect Relationship

Factor	Ri	Ci	Ri + Ci (Prominence)	Ri – Ci (Net Effect)	Role
Price	9.95	10.91	20.86	-0.96	Effect
Trust	10.78	10.59	21.38	+0.19	Cause
Delivery	10.59	8.32	18.91	+2.27	Cause
Influencer	8.93	9.47	18.41	-0.54	Effect
Return & Refund	9.68	10.64	20.32	-0.96	Effect
Return and Refund	2.162231	2.110779	1.631226	1.863864	1.909756

highlighting Trust and Delivery as the primary cause factors shaping online consumer behaviour in Nepal. Price, Influencer Marketing, and Return & Refund are classified as consequence variables, implying that they are mostly results influenced by the main drivers rather than change initiators themselves. This relational structure is visually expressed in two essential figures. Figure 1 shows

a cause-effect network diagram (digraph) that depicts only significant relationships ($\alpha = 2.034$). The arrows connecting Trust and Delivery to the other aspects provide clear visual evidence of their causal dominance in the network.

Table 2 represents the quantitative underpinning for this image, which including computed values for Prominence

(R_i+C_i) and Net Effect (R_i-C_i). The statistics in this result provide for a clear classification of each factor's role. The statistics and table provide two key insights.

First, trust is identified as the most important feature of the system, with the highest overall relevance ($R_i+C_i = 21.38$), stressing its crucial role as the cornerstone of customer confidence. These findings demonstrate that efficient and dependable logistics are more than just an operational concern; they are a critical strategic driver that directly influences consumer perceptions of value, trust, and post-purchase security.

The results also reveal that Trust and Delivery are key system drivers, having direct influence on critical outcome characteristics such as Price and Return & Refund. Interestingly, Price has a dual role; while it has some influence on Trust and Return & Refund, its overall position in the network suggests that it acts more as an effect factor, responding to stronger causal elements. In this dataset, however, influencers play just a modest role, with low causal power, demonstrating that, while they may assist shape customer perceptions, their direct impact on online purchase decisions is substantially weaker than other factors.

Discussion

This study employed the DEMATEL technique to analyze the complex interrelationships between factors influencing online shopping decisions in Nepal. The analysis reveals a clear hierarchy of influence, with precise insights that both confirm and clarify previous research. The discovery that trust is the most prominent element (highest R_i+C_i) and a critical causal driver supports the work of Mani and Chouskey (2022) and Sivanesan (2020), who identified it as a major component influencing happiness and security. Our findings show that trust is not just significant in Nepal, but also necessary for affecting perceptions of other variables such as pricing fairness and the reliability of return policies.

Similarly, Delivery's status as the strongest net driver (highest R_i-C_i) adds important context to our existing understanding of logistics. While its significance is widely recognized, this analysis shows a disproportionately causal effect in a developing economy like Nepal. This finding is consistent with the actual concerns reported by local experts (Adhikari, 2021), implying that, in addition to its usual operational function, delivery is a primary strategic instrument for building confidence and justifying pricing. In contrast, the inclusion of Price as an influence factor deepens the findings of Jadhav and Khanna (2016) and Akar and Nasir (2015). While competitive pricing remains important, our model demonstrates that it is typically secondary; it is the product of a dependable and efficient system rather than the primary initial attractor in this market. Finally, the low role of Influencer Marketing contrasts with the growing global emphasis on its impact (Sinha & Kim, 2023). The difference shows an important contextual insight: in Nepal's growing e-commerce sector, functional and risk-based considerations like trust

and delivery considerably surpass the peripheral benefit of influencer social proof. This finding has important implications for marketing strategy, emphasizing that resources should be devoted into core service delivery before aggressively engaging in influencer initiatives.

To put it simply, Nepalese online buyers make decisions based on a causal hierarchy rather than a flat list. This study verifies the underlying importance of trust established in the literature while emphasizing the enhanced, causative power of delivery performance in this situation. It also helps us better understand price and influencer marketing, revealing that their roles are more reactive and peripheral, respectively. This establishes a clear, evidence-based hierarchy of strategic priorities for e-commerce platforms operating in Nepal.

CONCLUSION

This study reveals trust and delivery as the key causal drivers of online purchase decisions in Nepal, with price, influencer marketing, and return and refund policies serving as dependent outcomes. Trust is the foundational aspect, with Delivery acting as the strongest net influencer, demonstrating that functional reliability trumps marketing appeals in this expanding industry.

This study is not without limitations. The conclusions are based on the opinions of 17 experts, which, although appropriate for DEMATEL, may limit generalizability. Furthermore, the approach concentrates on five essential characteristics, possibly leaving out others such as website usability or social influence. Future study should validate these findings with a bigger consumer survey and include more variables to build a more complete model.

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Summary of scores from all the experts

Price	Trust	Delivery	Influencer	Return and Refund
P	0	47	34	45
T	58	0	43	46
D	51	54	0	37
I	39	39	35	0
R	50	52	31	38
Return & Refund	9.68	10.64	20.32	-0.96
Return and Refund	2.162231	2.110779	1.631226	1.863864

Direct Relation Matrix

P		T	D	I	Return and Refund
P	0	2.7647	2	2.647	3.0588
T	3.4117	0	2.5294	2.7058	2.8823
D	3	3.1764	0	2.1764	2.8235
I	2.2941	2.2941	2.0588	0	2.5294
R	2.9411	3.0588	1.8235	2.2352	0
Return and Refund	2.162231	2.110779	1.631226	1.863864	1.909756

Normalized Direct Relation Matrix

Factors/criteria	Price	Trust	Delivery	Influencer	Return and Refund
Price	0	0.2398	0.173473	0.229591	0.265309
Trust	0.295918	0	0.219391	0.234691	0.25
Delivery	0.260209	0.275509	0	0.188773	0.2449
Influencer	0.198982	0.198982	0.178573	0	0.219391
Return and Refund		3.0588	1.8235	2.2352	0
Refund	0.2551		1.631226	1.863864	1.909756