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Sustainable transformation of quick commerce in India: A hybrid entropy-ISM approach to barrier analysis

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Abstract

In India Quick commerce (Q-commerce) is rapidly transforming urban retail by enabling the delivery of vital products within 10 to 30 minutes. The Q-commerce market of Indian country is expanding rapidly. In forecasting report of Statista, the market is projected to reach US$5.6 billion in 2026 and US$10.2 billion by 2031, reflecting the increasing demand for rapid last-mile delivery services along with continued growth of the market. Objective of this study is to determine and classified the key barriers influencing its sustainable growth. Multi-criteria decision-making (MCDM) approach is applied, integrating Entropy Weight Method (EWM), Simple Additive Weighting (SAW), and Interpretive Structural Modelling (ISM). With study of literature 16 major barriers were identified. Expert opinion evaluated to determine their interrelationships and relative importance. Most remarkable barriers are infrastructure constraints, limitations in AI-based demand forecasting, packaging waste issues, and concerns regarding product authenticity in this research work. Gig worker instability, inefficiencies in last-mile delivery, regulatory uncertainties, and high consumer price sensitivity further hinder sectoral expansion. ISM framework employed to classify all barriers into hierarchical levels foundational, intermediate, and dependent demonstrating how fundamental challenges influence operational performance and customer satisfaction. By integrating multiple decision-making methodologies, this study gives a well-structured framework for identifying barrier interrelationships and practical insights for platform operators, policymakers, and logistics stakeholders to support sustainable Q-commerce evolution in India.

Keywords

Q-commerce, entropy weight method, interpretive structural modeling, sustainable urban retail, gig economy challenges

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1. Introduction

Quick commerce (Q-commerce) represents a growing retailing trend in digital India which enables customers to receive their daily essentials as food items and basic household needs in a time span between 10 to 30 minutes. The delivery model of ultra-fast delivery stands significantly different from traditional E-commerce through its speedy approach across all aspects including dark stores and the need for urban delivery workers. Person who drives professionally are one of the important part or collaborators in the Q-commerce occupation. They play key participation by making sure that the right demand is fulfil to

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the right customer in the right condition.[1] The Q-commerce trend in urban India has progressed through various startups that capitalize in change of behaviour of consumers buying in the post-pandemic era.[2] The penetration of Q-commerce in urban markets is inducing various challenges that threaten to slow down its market growth and sustainability in India.[3] The operational factor demands the model to sustain under minimum-profit scenarios with hefty fulfilment costs for which it requires concentrated order streams to recover fulfilment infrastructure costs. Q-commerce generates operational hurdles through usage of gig workers since it results in improper pay distributions and unstable employment and unsafe delivery environments due to forced speed expectations.[4] The Indian market offers unique challenges in infrastructure and regulation that companies have to navigate through. The infrastructure mix of segmented roadways with unorganized urban development and weak cold supply chains becomes a huge barrier to increased operations especially in non-Tier 1 cities.[5] The ecosystem is challenged by regulatory uncertainty since existing policies are not aligning with Q-commerce operations in terms of zoning regulations along with worker categorization frameworks. Customer behaviour towards trust in digital payments and price sensitivity rate and payment habits hinders Q-commerce market growth beyond central urban districts. Although customers opt for instant delivery for their convenience, they are not abandoning their familiar neighbourhood grocery shop habits for cost-neutral essential buying. The behaviour of consumers towards instant-delivery service is still under massive influence of their sustainability-related concerns along with rising concerns regarding packaging waste creation.[6] Overhauling Q-commerce market development calls for evaluation of chief hurdles which are present in addition to Q-commerce's complicated framework. Current market surveys, academic studies, and latest industry reports from the base for this literature review to analyse the infrastructural and regulatory, operational, workforce, as well as behavioural challenges in Indian Q-commerce.

2. Literature review

Literature shows that Q-commerce in India, despite growing at a fast rate, faces challenges of multifaceted nature, which are obstructing their sustainable development. Infrastructure limitations, particularly in Tier 3 and Tier 2 cities, are restricting the development of efficient supply chains along with last-mile distribution infrastructure.[7] According to Potdukhe et al. 2022,[8] the instant delivery model is built on three fundamental components: technology, dark stores, and delivery personnel. The customer journey typically begins with the use of digital platforms such as websites or mobile apps. Once an order is placed, the dark stores receive a notification and prepare the items for dispatch within approximately 2 to 2.5 minutes. The final leg of the process is managed by delivery personnel, who pick up the prepared orders and ensure they reach the customers promptly, completing the entire transaction. These delivery agents play a crucial role in facilitating efficient last-mile delivery.[9] Alberto et al.,[10] highlight that e-commerce has transformed packaging requirements by emphasizing product protection and sustainability. The issue of consumer trust, which is initiated by product quality along with reliability in deliveries, is also adding to adoption barriers.[11] There are also challenges for labour too, with working conditions being precarious for gig labourers with limited social security covers.[12] Verma et al., [13] concludes that data-driven analytics can enhance e-commerce logistics by identifying delivery inefficiencies and supporting more effective operational decision-making. The economic adversity challenges such as high competition in price along with operational expenses are bringing down profitability in Q-commerce endeavours.[14] According to[15] logistics strategy is widely recognized as important, there is still limited understanding of how it should be tailored to different types of logistics challenges. This becomes particularly critical for new e-commerce companies that must develop their logistics strategies from the ground up. The regulatory uncertainty in zoning regulations along with labour categories is also causing legal ambiguities to entities engaged in this sector. One of the primary drivers behind the growth of businesses today is the integration of digital technologies into their operational frameworks. These technologies have significantly reshaped how companies engage with various stakeholders. Silva et al.,[16] investigated the major drivers of Q commerce which influenced the food waste sector in European context. As noted,[17,18] digital transformation involves organisational changes that arise due to the extensive adoption of digital tools and systems, ultimately leading to the creation of innovative digital business models that enhance value generation and capture for the organization. According to,[19] e-commerce and quick commerce can be distinguished by several factors, including delivery speed and method, customer demographics, user preferences, and the existence of physical stores. While e-commerce typically involves delivery times ranging from one day to a week, quick commerce focuses on delivering orders within an hour.[20] Panesar et al.,[21] investigated the impact of social, technological, quality and marketing factors on Q-commerce industries. The finding offers practical insights of socio and consumer behaviour research on the adoption of Q commerce services.

2.1. Infrastructure and consumer-centric challenges

India is confronted with great challenges with regard to deploying an efficient supply chain network for Q-commerce due to its merger delivery capacity in diverse urban hubs. Micro-warehousing facilities with cold chain storage facilities along with rapid-moving last-mile transportation are still inadequate in Tier 2 and Tier 3 cities due to the absence of such establishments which acts as a deterrent to fulfilling commitments in terms of deliveries.[7] Metropolitan cities have relatively superior infrastructure to other urban hubs but operational problems with traffic congestion coupled with stringent parking policies along with lesser routing of deliveries as described by lead to operational impairments. Various Q-commerce platforms encounter issues in terms of deliveries since they have to restrict service points or offer lesser product range to hedge operational costs from a fragmented transportation system. The major impediments to success also involve poor customer experience in addition to limited physical infrastructure. Ramaswamy et al.,[11] identify that trust levels continue to remain weak about ultra-fast delivery applications used by Indian consumers. Internet consumers especially in those cities with lesser exposure to e-commerce culture avoid buying as they fear failed transactions coupled with lost products along with substandard quality perishables. The reluctance of consumers in abandoning their traditional buying habits makes adoption more complicated since they tend to inspect products before purchase coupled with price negotiation.[22] Rapid-delivery service operations contribute to two problems of sustainability through enhanced packaging trash coupled with increased ecological impact from various proscribed delivery distances. Urban youth customers have been compelling platforms to organize eco-friendly initiatives due to increased sensitization to ecological concerns. Implementation of green logistics incurs greater operational expense that causes another compromise in terms of service speed versus success in sustainability.

2.2. Labor, regulatory, and economic constraints

India's biggest structural challenge in Q-commerce lies in its over reliance on temporary workers for deliveries. These workers face unpredictability in their pay, long working hours, and very limited access to social benefits due to their short-term, on-demand contracts. According to[12] most delivery personnel don't receive health insurance, paid leave, or retirement benefits. This is a serious ethical concern and undermines workforce stability. High turnover and dissatisfaction in employees also make effect service consistency, leading to delays. Unregulated, ever-shifting nature of flexible work often puts these workers in vulnerable and miserable positions, where their rights lag behind the pace of change in technology.

According to Chowdhury et al.,[23] key organizational and operational barriers to digital transformation in the cement industry, emphasizing that management commitment and reverse logistics play a crucial role in achieving sustainable industrial development. Major barrier for Q-commerce industries operating in markets of Indian country is Profitability. Naik et al.,[14] highlight businesses face intense competition, with customers demanding steep discounts, free delivery, and ongoing promotional deals. Tsang et al.,[24] highlights that blockchain-enabled supply chain performance evaluation can improve sustainability, resilience, and overall decision-making in modern e-commerce supply chains. To survive, companies must operate on a very narrow profit margins while managing high operating and marketing costs. Additionally, Indian consumers tend to prioritize low prices over fast delivery, making it even harder for these platforms to build and scale sustainable revenue model.[25] Lam et al.,[26] proposed a model that substantially enhances logistics operations compared with conventional human decision-making. The results demonstrate notable improvements across key operational performance indicators following its implementation.

On the regulatory front, the landscape is outdated. There are no clear policies governing the operation of dark stores in residential areas nor are there defined responsibilities around labour rights or data privacy for digital platforms.[14] Startups also face difficulties scaling across different states, as inconsistent interpretations of regulations lead to legal ambiguity, which creates problems in formal investment and hampers growth.[27] Although previous studies have explored various operational and consumer-related aspects of Q-commerce, a comprehensive assessment of the barriers affecting its sustainable development remains limited, particularly in the Indian context. This research addresses this gap by proposing an integrated EWM–SAW–ISM framework that not only prioritizes finalized barriers but also reveals their hierarchical interrelationships. Unlike earlier studies that mainly focus on individual issues such as consumer behaviour, logistics, or technology adoption, this study gives a holistic perspective by combining objective weighting, systematic ranking, and structural modelling within a single decision-making framework. findings identify most critical barriers influencing sustainable growth of Q-commerce it offers actionable insights for policymakers, platform operators, and logistics practitioners. By presenting a structured roadmap for prioritising and addressing these challenges, this study contributes to both the academic literature on sustainable digital retail and the practical advancement of Q-commerce in emerging economies.

Despite the rapid growth of Q-commerce in India, its sustainable development continues to face several interconnected operational, technological, environmental, and regulatory challenges. Existing studies have primarily examined these issues in isolation, with limited attention given to their relative importance and underlying interrelationships. As a result, decision-makers lack a systematic framework to identify the most critical barriers and understand how these barriers influence one another. Therefore, the central research problem addressed in this study is:

RQ1: What are the major barriers affecting the sustainable development of Q-commerce in India?

RQ2: Which barriers have the greatest influence when evaluated using an objective weighting and ranking approach?
RQ3: How are these barriers hierarchically related, and which barriers act as the key driving factors within the Q-commerce ecosystem?

To address this problem, the study integrates the Entropy Weight Method (EWM), Simple Additive Weighting (SAW), and Interpretive Structural Modeling (ISM) to rank the identified barriers and examine their hierarchical relationships.

3. Research methodology

3.1. Barrier identification and data collection

The aim of researchers is to find out what obstacles operated at multiple levels like operations, infrastructure, behaviour and technology which slowed down Q-commerce expansion. The experts' preliminary talks combined with secondary research helped to establish 16 major barriers which were selected for subsequent evaluation as shown in Table 1.

A structured questionnaire served to evaluate the importance of each barrier. The research instrument featured a five-point Likert assessment system that enabled professionals to rate the impact strength of Q-commerce obstacles between "Very Low Influence" and "Very High Influence." A questionnaire was distributed to 29 experts from Q-commerce and academic fields while they supplied their responses according to their field knowledge and industrial experience. The demographic profile of the respondents in terms of age and profession is presented in Figure 1 and Figure 2, respectively

3.2. Analysis and structural interpretation

Executed data from the questionnaire formed a decision matrix that underwent normalization to create mutually comparable input values. All measured barriers were normalized into final scores to determine their overall ranking position. The analysis produced an official ranking of the most vital barriers that Q-commerce faces today. The experts used the Structural Self-Interaction Matrix (SSIM) to identify directional relationships between pairs of factors based on their received input. Experts transformed the matrix data into a reachability matrix for iterative analysis with transitivity checks which yielded a hierarchical structure. The final structural model clarified which barriers operate as primary causes while others result from existing inefficiencies in the system. The overall analytical procedure is summarised in Figure 3.

4. Application of MCDM method

4.1. EWM weight calculation

The idea of entropy is ideally suited to objectively evaluate the relative significance of evaluation criteria in decision-making. EWM is used in this study to allocate weights to important benefit-type criteria related to the obstacles in Q-commerce in the Indian economy, including rider availability, regulatory difficulties, delivery uncertainties, infrastructure constraints, and platform responsiveness.

The decision matrix is created using observed data and expert evaluations given m =29 responses and n =16 evaluation criteria. Normalising the decision matrix, figuring out the entropy value for each criterion.

$$\mathrm{D} = \left(x_{ij}\right)_{m\times n} \tag{1}$$

The decision matrix is normalized as:

$$p_{ij} = \frac{x_{ij}}{\sum_{i=\alpha}^{m} x_{ij}} \tag{2}$$

The information entropy for each index is defined as:

$$E_j = -(\ln\ m)^\wedge(-1)\sum_{i=1}^{n} p_{ij}\ \ln\ p_{ij} \tag{3}$$

and the weight obtained from information entropy is calculated as follows:

$$w_j = \left(1 - E_j\right) \Big/ \left(n - \sum_{j=1}^{n} E_j\right) \tag{4}$$

Table 1. Final barriers affecting the sustainable development of Q-Commerce.

Factors	Subfactors	Descriptions
Delivery	Partner Selection **(B1)**	Choosing reliable delivery and Supply partners to maintain speed, quality, and operational efficiency in the Q-commerce ecosystem.[12,28]
	Timely Delivery **(B2)**	Ensuring orders reach customers within the promised short time frames, often under 30 minutes, is critical for customer satisfaction in Q-commerce and examination fast delivery models, core to Q-commerce.[29]
	Route Optimization **(B3)**	Efficiently managing delivery paths to minimize time and maximize order fulfilment using real-time traffic and location data.[30]
	Order Density **(B4)**	Studies how matching customer expectations with actual order density impacts e-commerce, aiming to improve customer experience quality.[24]
Consumer Related Challenges	Product Authenticity **(B5)**	Guaranteeing that all items are genuine and meet quality standards to build trust and ensure customer satisfaction.[31]
	Customer Personalization **(B6)**	Failure to engage customers through tailored interactions can reduce loyalty and diminish the overall customer experience in Q-commerce.[32]
	User Interface **(B7)**	The app's design should be intuitive, ensuring that users can easily navigate and interact with the application, enhancing the overall experience.[8,33,34]
Technology and Infrastructure Constraints	Infrastructure Limitations **(B8)**	Underdeveloped logistics and digital facilities in low-tier cities hinder smooth operations and the rapid scaling of Q-commerce services.[35]
	AI-Driven Forecasting **(B9)**	Efficient inventory management depends on advanced AI-driven demand forecasting to optimize stock and operations, a capability that requires substantial investment.[36]
Social Barriers	Target Demographics **(B10)**	Q-commerce primarily appeals to middle- to high-income households in metro and Tier-1 cities.[37]
	Tech & Price Sensitivity **(B11)**	Lower-tier cities tend to have lower technology adoption and a reduced willingness to pay for convenience, affecting the potential scalability of Q- commerce in these areas.[37]
Environmental Barriers	Traffic Congestion **(B12)**	The push for instant deliveries increases vehicle movement in already busy urban areas, contributing to congestion and longer travel times.[38]
	Fuel & Safety Concerns **(B13)**	Urgency can lead to over- speeding and suboptimal routing, raising fuel consumption and safety risks in high-pressure delivery environments.[3]
	Packaging & Waste Generation **(B15)**	Q-commerce practices like excessive packaging and frequent shopping lead to increased environmental waste and sustainability challenges.[39]
Intense Market Competition	Margin Pressure **(B14)**	Heavy discounting and price wars in the competitive Q- commerce space significantly reduce profit margins for businesses.[40]
	Scaling Challenges **(B16)**	The dominance of major players makes it difficult for startups and regional brands to scale and compete effectively in the Q-commerce market[41]

where $0 \le w_j \le 1$ and $\sum_{j=1}^{n} w_j = 1$

4.2. SAW methodology

Simple Additive Weighting (SAW) method is applied in this study to evaluate and rank the key barriers in Q-commerce in economy of Indian country. This method enables structured decision-making by scoring alternatives based on multiple weighted criteria.[42]

The EWM–SAW approach was adopted because it provides an objective, transparent, and computationally efficient framework for ranking barriers. EWM determines criterion weights objectively from data variability, minimizing subjective bias, while SAW generates simple and easily interpretable rankings that integrate effectively with ISM. Compared with

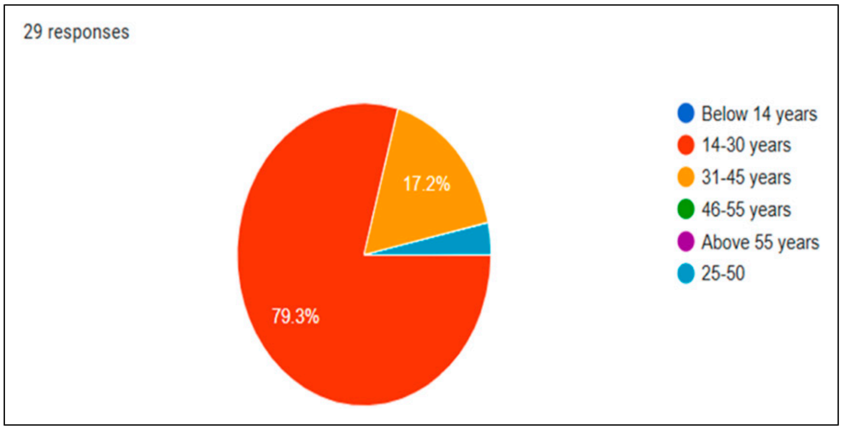

Figure 1. Age-wise distribution for barrier identification and data collection.

methods such as TOPSIS or VIKOR, EWM–SAW requires fewer assumptions and is well suited to the exploratory nature of this study. The steps involved are:

1. **Identifying the factors:** Factors are identified through literature and expert input.
2. **Decision Matrix Normalization:** Next step is used for proper comparison purposes on raw data.

Criterion is a benefit criterion:

$$r_{ij}^{+} = \frac{Xij}{X_j^{Max}}, i = 1, 2 \ldots, m \tag{5}$$

Criterion is a cost criterion:

$$r^{-}_{ij=\frac{X^{Min}}{X_{ij}}, i=1,2, \ldots, m} \tag{6}$$

3. **Assigning Weights**: Criterion weights are calculated using Entropy Weight Method (EWM). According to[43,44] Entropy weight method (EWM) is an important data weight representation. The EWM's biggest output over other subjective models is that it eliminates individual interference on indicator weight, improving the impartiality of the overall evaluation's outcomes.[45,46]
4. **Calculating the Weighted Normalized Matrix**: Normalized values are multiplied by the corresponding weights:

$$v_{ij}\ (x) = w_j\ r_{ij}(x)\ \ i = 1 \ldots, m;\ \ j = 1 \ldots, n$$

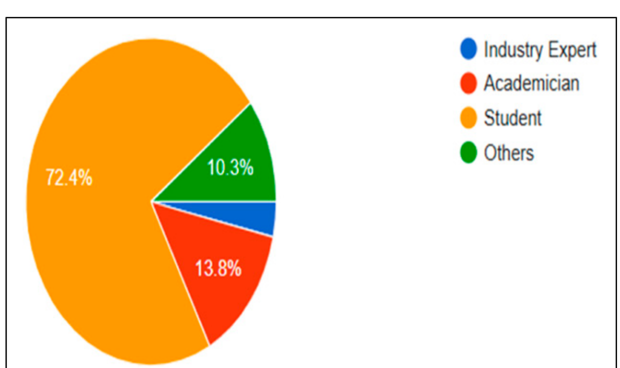

Figure 2. Barrier identification and data collection based on profession.

5. **Calculating Total Scores**: Total score is computed by summing all weighted values for each barrier:

$$S_i = \sum_{j=1}^{n} v_{ij} \tag{7}$$

6. **Ranking the Alternatives**: Barriers are ranked in descending order of their total scores. Highest scoring factor is finalized because it is most critical barrier in Q-commerce.

4.3. Interpretive structural model

The research uses Interpretive Structural Modelling (ISM) as its analysis method to identify linkages between the existing barriers in Q-commerce across the Indian economic landscape. Warfield introduced ISM as a method to transform ambiguous relationships between complex variables by obtaining expert opinions which produce structured models.

This study uses ISM as an analysis technique because it provides multiple benefits that support its application. Advantages: -

1. The approach creates systematic links between different variables that depend on each other.[37]
2. The technique decomposes intricate issues into organized hierarchical structures according to Sage, 1977.[41]
3. The methodology develops visual directed graph models called digraphs to display relationships according to the research by Attri et, al.,.[29]

The current study utilizes the ISM methodology with these sequential steps in the research analysis.

1. Identifying Q-commerce barriers through both experts' knowledge and literature review examination.
2. Establishing the relationships between barriers which have been identified.
3. Structural Self-Interaction Matrix (SSIM) construction to record bidirectional linkages between variables.
4. Transitivity check of the SSIM and form Final reachability matrix (FRM)
5. Develop Level partition from the reachability matrix which is achieved in step 4.

The structured modelling method helps people understand how Q-commerce barriers relate to each other while establishing a basis for strategic decisions about policy creation.

5. Numerical illustrations

5.1. Calculation of the EW of criteria

The Entropy Weight Method (EWM) is an objective technique used to assign weights to criteria. It calculates entropy, criteria with higher entropy are seen as more influential and are given higher weights. In this study, EWM is used to objectively determine the importance of barriers in Q-commerce. The calculations of entropy and final weights are shown in Table 2.

5.2. Ranking the factors through SAW analysis

Simple Additive Weighting (SAW) method is used to rank the factors affecting Q-commerce operations based on their importance. First the factors are identified, and their weights are calculated using the Entropy Weight Method (EWM). The data requires normalization before proceeding with cross-criteria comparison. Each normalized value is multiplied by its corresponding weight to obtain weighted normalized scores. These scores are summed to compute the total score for each barrier. Barriers are ranked based on their total weighted normalized scores, with the highest score indicating the most critical barrier. Table A1 (Appendix) presents the decision matrix, Table A2 (Appendix) shows normalized matrix, Table A3

Table 2. Entropy-based weight calculation of evaluation criteria.

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Entropy	0.98	0.99	0.99	0.99	0.99	0.98	0.98	0.96	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Weights	0.07	0.03	0.04	0.03	0.05	0.08	0.05	0.14	0.07	0.05	0.05	0.08	0.10	0.06	0.05	0.05

Table 3. Ranking based on their total weighted normalized scores.

Final ranking	8	14	7	5	4	13	3	2	12	1	6	9	10	16
Norm. score	1.33	0.87	0.80	0.72	0.67	0.61	0.65	0.60	0.52	0.48	0.46	0.40	0.35	0.32

(Appendix) shows weighted scores and Table 3 shows ranking based on their total weighted normalized scores, while Figure 4 visualizes the final rankings.

5.3. ISM analysis

A total of 16 barriers for ISM analysis were chosen based on their importance through the SAW method following literature review and an evaluation of interconnections. The selected top barriers enhance clarity which enables researchers to develop brief hierarchical relationships between these factors. Data collection techniques included focused group discussions with both academic/industry experts and Q-commerce professionals totalling 29 participants. This number composed of 3 academic experts, 24 students and 2 were industry experts who had the knowledge of Q-commerce industry.

5.3.1. Structural self-interaction matrix (SSIM)

The Structural Self-Interaction Matrix (SSIM) is developed by comparing each pair of selected barriers shown in Table 4. The relationships between these factors are evaluated using the concept of “distance”, where one barrier’s influence on another is interpreted as a directional cause–effect relationship. When no relationship exists between the factors then the barriers remain independent without any influence on each other. The assessment process determines how each pair of factors relate to each other (i and j). The relationships between barriers are displayed as four coded symbols: V signifies how i affects j whereas A represents j’s impact on i as well as X stands for mutual influence between i and j and O signifies both barriers are independent of each other. The developed matrix constitutes the basis for ISM framework development.[47,48]

5.3.2. Final reachability matrix

To construct the Reachability Matrix, the entries from the SSIM are converted into binary values (0 and 1), as shown in Table 5. This transformation follows specific rules:

V (factor *i* influences *j*): (i, j) = 1; (j, i) = 0
A (*j* influences *i*): (i, j) = 0; (j, i) = 1
X (mutual influence): (i, j) = 1; (j, i) = 1
O (no relation): (i, j) = 0; (j, i) = 0

The binary matrix enables transitivity checks and level partitioning during the ISM process.

Table 4. Structured summary of influencing measures (SSIM) for the 16 key factors.

	B16	B15	B14	B13	B12	B11	B10	B9	B8	B7	B6	B5	B4	B3	B2	B1
B1	X	O	O	O	O	O	O	O	O	O	O	O	O	O	O	X
B2	O	O	O	A	A	O	V	O	O	A	O	O	O	A	X	
B3	O	O	O	X	O	O	O	O	O	O	O	O	A	X		
B4	A	A	A	A	X	O	O	O	O	O	O	X	X			
B5	O	O	O	V	O	O	V	O	O	O	X	X				
B6	V	O	O	X	A	O	A	V	A	O	X					
B7	O	O	O	O	O	O	O	A	O	X						
B8	A	O	O	A	V	O	O	A	X							
B9	A	A	O	O	O	O	A	X								
B10	A	O	V	O	O	A	X									
B11	A	O	O	O	A	X										
B12	A	O	V	O	X											
B13	O	O	V	X												
B14	O	V	X													
B15	O	X														
B16	X															

Table 5. Final reachability matrix for barrier analysis.

No.	Factors	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Driver factors
1	Partner selection	1	1	1	1	1	0	0	1	1	1	1	1	0	1	1	1	12
2	Timely Delivery	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	13
3	Route Optimization	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13
4	Order Density	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	14
5	Product Authenticity	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	14
6	Customer Personalization	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	14
7	User Interface	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	14
8	Infrastructure Limitations	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	14
9	AI-Driven Forecasting	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16
10	Target Demographics	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	15
11	Tech & Price Sensitivity	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	15
12	Traffic Congestion	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	15
13	Fuel & Safety Concerns	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	15
14	Packaging & Waste Generation	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	13
15	Margin Pressure	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	16
16	Scaling Challenges	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	16
	Driven Factors Total	12	13	13	14	14	14	14	14	16	15	15	15	9	10	15	15	

5.3.3. Level partitions

After constructing the reachability matrix, the next step involves determining each factor's reachability and antecedent set (Table 6). The analysis begins with two separate sets that include the reachability set showing all elements influenced by a factor while the antecedent set shows which elements influence the selected factor. We obtain distinct hierarchical positions through set intersection analysis because the factors show the same reachability and intersection patterns with the current level assignment. The analysis proceeds with exclusion of the recognized elements in subsequent rounds.[49] The analysis runs until all factors receive designated levels. Each round of level assignment produces specific results which are shown in Figure 5.

5.3.4. Reduced conical matrix

After level partitioning of factors reduced conical matrix is formed. A reduced conical matrix helps in forming the ISM digraph as shown in Table 7.

6. Result and discussion

Using an integrated EWM–SAW–ISM approach, this study systematically analysed the key barriers affecting the sustainable growth of Q-commerce in India. 16 major barriers were determined with expert consultation, subsequently ranked and hierarchically structured to understand their relative importance. Outcomes are consistent with previous studies emphasizing that infrastructure, technological capability, and regulatory support play a major role in improving operational efficiency. The hierarchical analysis further demonstrates how foundational barriers influence other operational obstacles. These insights provide practical guidance for platform managers and policymakers to prioritize strategic interventions, optimize resource allocation, and support the sustainable development of the Q-commerce industries .

6.1. EWM–SAW-based ranking

With the help of Entropy Weight Method (EWM), objective weights were assigned to like timely delivery, route optimization and margin pressure. These weights were after used for Simple Additive Weighting (SAW) method to rank the barriers on the basis of their total weighted normalized scores.

The calculated scores indicated that the most critical barriers included:

AI driven forecasting
Infrastructure limitations

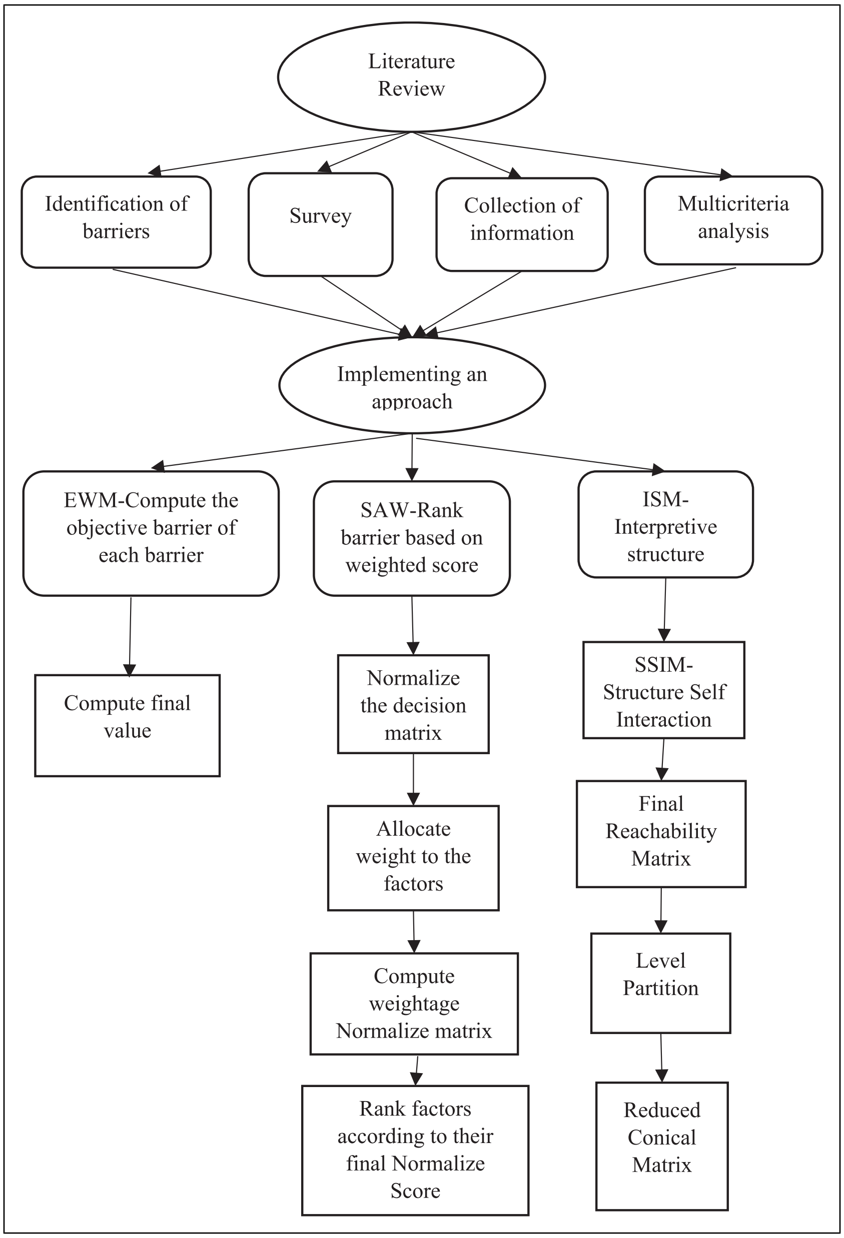

Figure 3. Flowchart for analysis and structural interpretation.

Packaging and waste generation
Product Authenticity

These factors were identified as having the highest total weighted normalized scores in Table 3 and are visualized in Figure 4 of the report.

6.2. ISM-based structural modelling

Interpretive Structural Modelling (ISM) technique was used to structurally model the 16 factors after the SAW ranking. To determine the contextual relationships between the factors, expert input from 29 participants, academicians, and industry professionals were gathered. Transitivity checks and level partitioning were performed after the resulting Structural Self-Interaction Matrix (SSIM) was converted into a Reachability Matrix.

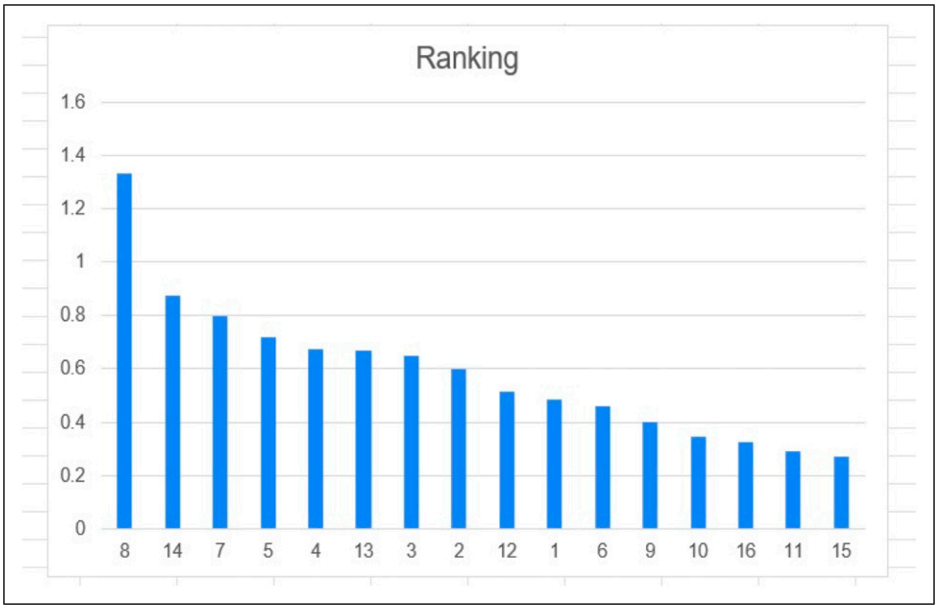

Figure 4. Total weighted normalized scores and ranking of critical factors.

A distinct hierarchical structure was demonstrated by the ISM model. The final reachability matrix is presented in Table 5, the level-partitioning results in Table 6, and the reduced conical matrix in Table 7. The resulting hierarchical linkages are visualized in Figure 5.

Foundational (Bottom-Level) Barriers: These include Partner Selection, Traffic Congestion, and Infrastructure Limitations that display a strong driving influence over other barriers.
Intermediate-Level Barriers: Such as Customer Personalization, User Interface, and Tech & Price Sensitivity, which are influenced by foundational factors and themselves impact top-level concerns.
Top-Level Barriers: Including Timely Delivery, Order Density, and Margin Pressure, which are mostly outcomes dependent on the resolution of deeper systemic issues.

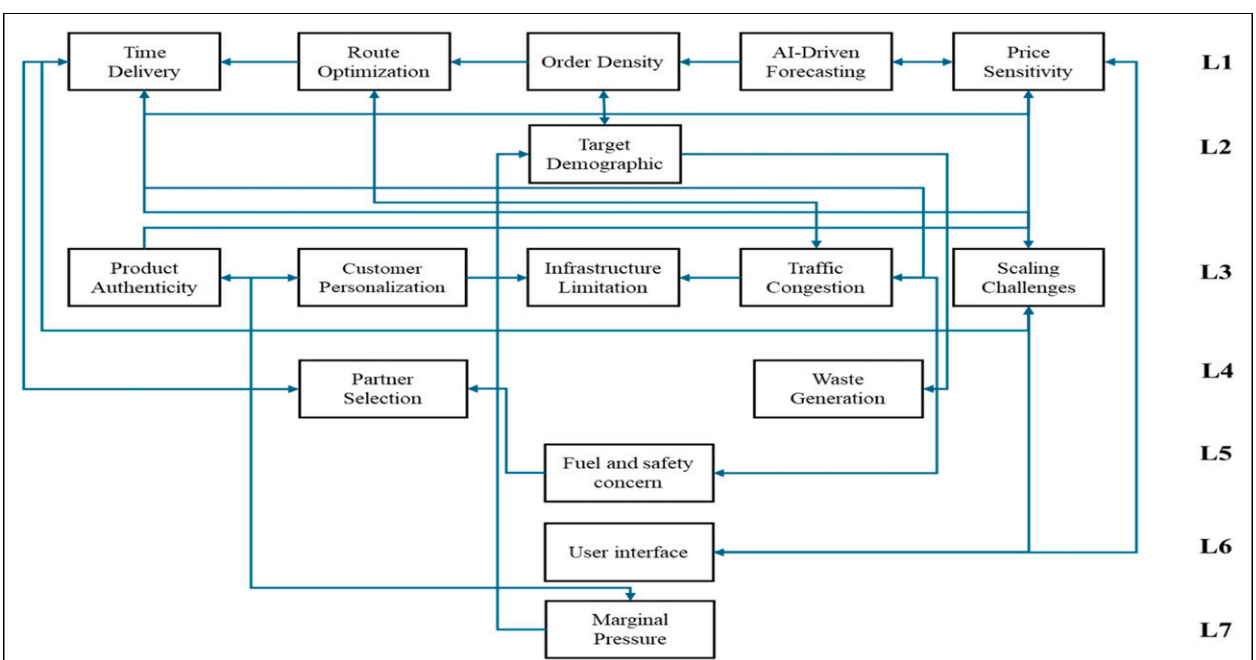

Figure 5. ISM framework depicting the hierarchical linkages among the identified Q-commerce barriers

Table 6. Final level partitioning of the identified Q-commerce barriers

Elements	Reachability set	Antecedent set	Intersection set	Level
1	1,2,3,4,5,8,9,10,11,12,15,16	1,2,3,4,5,6,8,10,12,13,15,16	1,2,3,4,5,8,10,12,15,16	4
2	1,2,3,4,5,6,9,10,11,12,15,16	2,3,4,5,6,7,8,9,10,11,12,13,15,16	2,3,4,5,6,9,10,11,12,15,16	1
3	1,2,3,4,5,6,9,10,11,12,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,9,10,11,12,15,16	1
4	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1
5	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	2,3,4,5,6,7,8,9,10,11,12,13,15,16	3
6	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	3
7	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,6,7,8,9,10,11,12,13,14,15,16	5,6,7,8,9,10,11,12,13,14,15,16	3
8	2,3,4,6,7,8,9,10,11,12,13,15,16	5,6,7,8,9,10,11,12,13,14,15,16	6,7,8,9,10,11,12,13,15,16	6
9	2,3,4,6,7,8,9,10,11,14,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	2,3,4,6,7,8,9,10,11,14,16	3
10	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1
11	2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	2,3,4,5,6,7,8,9,10,11,12,13,15,16	2
12	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1
13	2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	5,6,7,9,10,11,12,13,14,15,16	5,6,7,9,10,11,12,13,14,15,16	3
14	2,3,4,6,9,10,11,14	4,6,7,8,9,10,11,14,15,16	4,6,9,10,11,14	5
15	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	4
16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	1,2,3,4,5,6,7,8,9,10,11,12,13,15,16	3

The ISM model showed that upstream problems like route optimisation, partner selection, and infrastructure limitations affect timely delivery, which is sometimes perceived as a customer-facing problem at the surface level.[50,51] This emphasises how crucial it is to deal with fundamental operational and infrastructure problems as opposed to concentrating solely on the symptoms that are present right now.

Problems like packaging and waste generation and customer personalisation, for example, have surfaced as secondary effects that are heavily impacted by the main technological and logistical driver. In a similar vein, scaling challenges and margin pressure are end results that necessitate system-wide optimisation, beginning with infrastructure enablement and partner ecosystem design.[52,53]

The layered model provides stakeholders with specific insights that lead to execution plans for resolving fundamental problems and eliminating performance limitations during Q-commerce scale-up.

6.3. Practical implications

Insights derived from this study offer guidance for various stakeholders in ecosystem of Q-commerce. Findings also stress the need to invest in AI-driven demand forecasting systems to reduce inefficiencies and stockouts.[54] Policy makers can use

Table 7. Optimized conical matrix representation.

	2	3	4	9	11	10	6	8	12	16	1	14	13	7	15	Driving power	Level
2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	1
3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	1
4	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	1
9	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	15	1
11	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	1
10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	1
6	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	2
8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	2
12	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	3
16	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	3
5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	3
14	1	1	1	0	1	1	1	1	1	1	1	0	0	0	0	8	4
13	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	5
7	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	14	6
15	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	16	7
Dependence Power	**16**	**16**	**16**	**15**	**15**	**15**	**12**	**11**	**10**	**10**	**9**						

structural understanding provided by the ISM model to craft regulatory frameworks that address foundational issues like infrastructure gaps and labour instability in the gig economy. Tackling concerns related to packaging waste and product authenticity will require collaboration between logistics firms, urban planners, and environmental agencies to ensure sustainable practices. For logistics partners, focusing on streamlining last-mile delivery processes and reducing bottlenecks in urban traffic systems can yield measurable improvements in service speed and reliability. This study basically equips stakeholders with a clear roadmap to prioritise interventions that not only address surface-level challenges but also the deeper, systemic barriers hindering Q-commerce growth in India.[55]

7. Conclusion

This research work applied a structured EWM–SAW–ISM methodology to determine major barriers hindering the growth and scalability of Q-commerce in India. 16 major barriers examined ranging from platform-related constraints to consumer behaviour and logistical challenges were. Integration of Entropy Weight Method (EWM) and Simple Additive Weighting (SAW) facilitated the prioritisation of these barriers with objective weighting and normalised performance scores. Final result highlighted partner selection, timely delivery, and route optimisation as the most pressing obstacles presently influencing the Q-commerce landscape. Use of Interpretive Structural Modelling (ISM) enabled a deeper exploration of the interrelationships in these factors, offering valuable insights into their hierarchical structure.

Current study has many limitations that should be acknowledged. First, analysis is based on expert judgement from small sample, which may not fully capture the diversity of perspectives across the rapidly evolving Q-commerce ecosystem in India. Second, identified barriers and their rankings are specific to the Indian context and may not be directly applicable to other countries with different regulatory, technological, and market conditions. Third integrated EWM–SAW–ISM framework provides an objective ranking and hierarchical understanding of barriers it assumes static relationships among factors and does not account for the dynamic nature of Q-commerce operations. Future studies can address these limitations by incorporating larger and more diverse stakeholder groups, validating the findings through empirical or longitudinal studies, and employing advanced approaches such as fuzzy MCDM, DEMATEL, ANP, or system dynamics to capture uncertainty and evolving interrelationships among barrier.

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Shabani Bhatia: Investigation, data curation, visualization.
Fuli Zhou: Validation, resources, writing review & editing.

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Appendix

Appendix A

Table A1. Interpretive structural modeling (ISM) – decision matrix.

Response	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	F16
1	7	9	5	7	7	3	9	3	5	5	7	1	3	7	7	5
2	1	3	5	7	9	5	7	1	3	5	7	7	9	7	7	7
3	5	7	9	9	9	9	7	3	5	7	9	9	9	9	9	9
4	3	5	5	9	9	1	9	9	1	1	1	9	3	9	1	1
5	5	5	5	5	7	3	5	1	3	5	3	5	9	3	3	3
6	5	7	7	7	5	5	5	7	5	5	5	3	5	7	5	5
7	5	5	5	5	5	3	5	5	5	5	5	5	3	5	7	5
8	5	5	5	5	5	5	5	9	7	3	9	7	9	9	9	7
9	7	5	7	9	5	5	5	5	5	7	7	3	5	3	7	9
10	7	7	9	5	7	5	7	5	5	7	9	3	7	5	3	7
11	7	5	5	9	7	9	7	7	5	7	7	9	9	9	9	9
12	5	5	9	7	7	9	5	7	9	7	5	7	7	7	5	5
13	7	5	9	5	7	5	7	5	5	7	7	7	7	7	7	5
14	7	7	5	5	7	5	9	3	1	3	9	5	3	7	9	3
15	9	7	9	5	7	1	3	5	5	5	5	7	7	3	7	9
16	5	5	5	7	5	7	5	5	7	7	7	1	3	7	7	5
17	7	7	7	9	9	9	9	7	7	7	7	7	7	7	9	9
18	3	5	5	5	5	9	1	1	3	1	1	1	9	5	9	3
19	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
20	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
21	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
22	7	7	9	9	9	9	5	7	5	5	5	5	5	5	5	5
23	5	5	9	5	5	5	5	9	9	9	9	9	9	9	9	9
24	5	7	5	5	5	7	9	5	5	5	5	5	5	7	7	7
25	3	5	5	7	5	3	5	7	5	5	5	3	5	7	7	7
26	1	3	7	9	9	7	3	3	3	3	3	3	3	3	3	3
27	5	5	5	9	5	9	9	7	3	3	3	3	3	3	3	3
28	5	5	3	3	9	7	5	1	7	3	5	3	9	9	3	5
Sum	158	176	164	184	174	168	186	146	162	150	174	166	156	186	178	170

Table A2. Interpretive structural modeling (ISM): Normalized reachability matrix.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	0.04	0.05	0.03	0.04	0.04	0.02	0.05	0.05	0.02	0.03	0.04	0.04	0.02	0.04	0.04	0.03
1	0.01	0.02	0.04	0.04	0.05	0.05	0.02	0.01	0.05	0.02	0.04	0.03	0.06	0.05	0.05	0.04
2	0.03	0.04	0.03	0.05	0.04	0.05	0.05	0.05	0.04	0.03	0.04	0.04	0.06	0.05	0.05	0.03
3	0.03	0.04	0.03	0.04	0.04	0.02	0.05	0.05	0.02	0.03	0.04	0.04	0.02	0.05	0.02	0.02
4	0.04	0.03	0.02	0.05	0.04	0.02	0.03	0.01	0.02	0.03	0.04	0.04	0.02	0.05	0.02	0.02
5	0.03	0.03	0.02	0.05	0.04	0.02	0.03	0.01	0.03	0.03	0.04	0.04	0.02	0.05	0.03	0.03
6	0.03	0.03	0.04	0.03	0.03	0.03	0.05	0.03	0.03	0.03	0.04	0.04	0.02	0.03	0.03	0.03
7	0.03	0.04	0.03	0.03	0.03	0.04	0.05	0.03	0.04	0.02	0.05	0.04	0.06	0.05	0.04	0.05
8	0.03	0.04	0.03	0.03	0.03	0.04	0.05	0.03	0.04	0.02	0.05	0.04	0.06	0.05	0.04	0.05
9	0.02	0.03	0.03	0.04	0.02	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.06	0.03	0.03	0.03
10	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.05	0.04	0.04	0.02	0.05	0.05	0.05
11	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.05	0.04	0.05	0.04	0.04	0.02	0.05	0.05	0.05
12	0.04	0.05	0.03	0.04	0.05	0.03	0.05	0.05	0.02	0.03	0.03	0.04	0.02	0.05	0.05	0.04
13	0.03	0.04	0.02	0.03	0.04	0.05	0.02	0.01	0.03	0.02	0.04	0.03	0.06	0.05	0.05	0.03
14	0.03	0.04	0.03	0.03	0.04	0.05	0.02	0.01	0.04	0.02	0.04	0.03	0.06	0.05	0.05	0.02
15	0.04	0.04	0.03	0.03	0.04	0.05	0.02	0.01	0.04	0.02	0.04	0.03	0.06	0.05	0.05	0.04
16	0.06	0.04	0.03	0.04	0.05	0.04	0.02	0.01	0.05	0.02	0.04	0.03	0.06	0.05	0.05	0.02
17	0.03	0.04	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.06	0.03	0.03	0.01
18	0.03	0.04	0.04	0.03	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.06	0.03	0.03	0.02
19	0.04	0.03	0.02	0.03	0.04	0.03	0.03	0.01	0.02	0.03	0.04	0.03	0.02	0.03	0.03	0.02
20	0.04	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.03	0.03	0.04
21	0.03	0.04	0.04	0.03	0.04	0.05	0.02	0.01	0.04	0.02	0.05	0.03	0.06	0.05	0.05	0.04
22	0.03	0.04	0.04	0.03	0.04	0.05	0.02	0.01	0.04	0.02	0.05	0.03	0.06	0.05	0.05	0.02
23	0.03	0.04	0.05	0.03	0.04	0.03	0.05	0.05	0.06	0.05	0.02	0.03	0.02	0.05	0.05	0.02
24	0.03	0.04	0.05	0.03	0.04	0.03	0.05	0.05	0.06	0.05	0.02	0.03	0.02	0.05	0.05	0.04
25	0.01	0.02	0.03	0.04	0.02	0.04	0.05	0.01	0.05	0.02	0.05	0.03	0.06	0.05	0.05	0.04
26	0.03	0.04	0.02	0.03	0.02	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.06	0.03	0.03	0.04
27	0.03	0.04	0.03	0.04	0.02	0.04	0.05	0.01	0.05	0.02	0.05	0.03	0.06	0.05	0.05	0.02
28	0.04	0.04	0.03	0.03	0.04	0.05	0.02	0.01	0.04	0.02	0.04	0.03	0.06	0.05	0.05	0.02

Table A3. Weighted normalized matrix for ISM analysis.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.01	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.01	0.08	0.03	0.03	0.01
2	0.07	0.01	0.02	0.02	0.02	0.01	0.05	0.14	0.07	0.02	0.01	0.01	0.01	0.02	0.01
3	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01
4	0.01	0.02	0.04	0.02	0.02	0.01	0.03	0.02	0.01	0.05	0.01	0.08	0.03	0.02	0.05
5	0.01	0.02	0.01	0.02	0.02	0.03	0.03	0.14	0.02	0.01	0.01	0.01	0.01	0.02	0.02
6	0.01	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.04	0.01
7	0.01	0.02	0.02	0.03	0.05	0.01	0.03	0.02	0.01	0.01	0.01	0.03	0.02	0.06	0.01
8	0.01	0.02	0.02	0.03	0.03	0.01	0.02	0.03	0.01	0.02	0.01	0.01	0.01	0.02	0.01
9	0.02	0.02	0.02	0.02	0.05	0.02	0.03	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.01
10	0.01	0.02	0.02	0.02	0.02	0.01	0.03	0.02	0.01	0.01	0.01	0.01	0.02	0.06	0.01
11	0.01	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.01
12	0.01	0.03	0.03	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01
13	0.01	0.02	0.03	0.02	0.02	0.01	0.02	0.02	0.01	0.02	0.01	0.03	0.02	0.02	0.01
14	0.01	0.02	0.01	0.03	0.02	0.01	0.05	0.14	0.01	0.02	0.01	0.02	0.03	0.03	0.02
15	0.01	0.02	0.02	0.03	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.02	0.02	0.04	0.01
16	0.01	0.02	0.03	0.03	0.03	0.08	0.05	0.02	0.01	0.01	0.01	0.01	0.10	0.06	0.01
17	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.01
18	0.01	0.02	0.03	0.03	0.03	0.01	0.05	0.14	0.02	0.01	0.02	0.01	0.10	0.06	0.01
19	0.02	0.02	0.03	0.02	0.03	0.01	0.02	0.14	0.01	0.01	0.05	0.01	0.02	0.02	0.01
20	0.01	0.02	0.02	0.03	0.03	0.02	0.03	0.03	0.01	0.01	0.01	0.02	0.02	0.03	0.01
21	0.01	0.02	0.02	0.03	0.03	0.02	0.03	0.03	0.01	0.01	0.01	0.02	0.02	0.04	0.01
22	0.01	0.02	0.03	0.03	0.02	0.01	0.02	0.03	0.01	0.01	0.01	0.01	0.01	0.04	0.01
23	0.01	0.02	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01
24	0.01	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.01	0.01	0.01	0.03	0.03	0.01
25	0.01	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.01	0.01	0.01	0.02	0.02	0.04	0.01
26	0.07	0.01	0.03	0.02	0.05	0.02	0.02	0.03	0.01	0.01	0.01	0.03	0.01	0.06	0.01
27	0.01	0.03	0.03	0.03	0.05	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.03	0.01
28	0.01	0.02	0.01	0.02	0.02	0.03	0.02	0.14	0.01	0.01	0.02	0.02	0.03	0.02	0.01

Abbreviation full form

Q-commerce	Quick Commerce
EWM	Entropy Weight Method
SAW	Simple Additive Weighting
ISM	Interpretive Structural Modeling
MCDM	Multi-Criteria Decision-Making
AI	Artificial Intelligence
MICMAC	Matrice d'Impacts Croisés Multiplication Appliquée à un Classement
SSIM	Structural Self-Interaction Matrix
TOPSIS	Technique for Order Preference by Similarity to Ideal Solution
DEMATEL	Decision-Making Trial and Evaluation Laboratory
ANP	Analytic Network Process