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Research Article

Exploring E-Commerce Marketing Logistics for Customer Satisfaction: A Configurational Approach Using fsQCA

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ABSTRACT

The rapid growth of e-commerce in India has revolutionized the retail landscape, offering customers unprecedented convenience, choice, and on-click accessibility. However, this growth has also introduced significant challenges for businesses, particularly in meeting customer expectations regarding marketing logistics (ML) dimensions. This study aims to explore the influence of ML dimensions — product accessibility, delivery charge, ecological packaging, reverse logistics, and responsive mechanisms — on customer satisfaction (CS) among Indian e-shoppers, by adopting the Stimulus-Organism-Response (S-O-R) framework and leveraging fuzzy-set Qualitative Comparative Analysis (fsQCA). This research provides a novel perspective on the contingent and interactional effects of ML dimensions on CS. The findings reveal six unique configurations of ML dimensions that maximize CS, underscoring the configurational nature of causality in the e-commerce domain. This study contributes to theory by deepening insights into the interplay between logistics factors and customer behavior. It also offers practical implications for e-commerce firms, equipping them with actionable strategies to enhance CS through sustainable logistics approaches. The study highlights the importance of adopting robust approaches to address the dynamic needs of digitally driven markets like India.

Keywords: : Customer Satisfaction, E-commerce, fsQCA, Marketing Logistics, Sustainability

INTRODUCTION

The growth of e-commerce in India has been driven by economic growth, favourable market conditions, digital ad spending, advent of covid-19, social media, and changes in consumer buying patterns (Tandon, 2021; Tripathi et al., 2024). As per the recent report of the Ministry of Commerce and Industry, India has the third largest online shoppers base in the world (only behind China, and the USA) and is predicted to surpass the USA to become the second-largest e-commerce market by 2034. In the last three years, nearly 130 million shoppers have been added and this is expected to increase to 350 million by 2025-26, with an improvement in the standard of living of over 1.4 billion Indian people. Further, research by Bain and Company predicts India to be a 120-140 billion USD industry by 2025-26, growing at a rate of 25-30% per year over the next three years. The average order size in 2021-22 increased by 69.4% YoY, compared to 44.9% in 2020-21 (Unicommerce & Wazir Advisors, 2022). This shift in consumer buying behaviour

has led to firms adopting digital transformation, with traditional offline retailers realizing the need for a robust online presence (Mishra et al., 2022; Polas et al., 2022; Song et al., 2022). Indeed, the growth in online businesses has transformed the customer and marketer relationships (Tripathi & Jaiswal, 2023).

Online shopping enables spontaneous information flow, capital flow, and customized commerce flows, leading to a trend towards higher demand standards for customer service. Meidutė-Kavaliauskienė et al. (2014) stated that the best way to serve the customer is the way the customer wants to be served. However, it toughens competition among e-retailers because it is no longer sufficient to have attractive products, competitively priced, and elegantly advertised (Sharma et al., 2023). Modern marketers are expected to provide time, products, places, and possession value simultaneously to satisfy and build better customer relations (Chandra & Jain, 2014).

Businesses can achieve their marketing goals of meeting customers' needs, creating value, and retaining customers by utilizing efficient marketing logistics. Marketing Logistics (ML) is defined as "the planning, implementing, and controlling of the physical flow of goods, services, and related information from points of origin to points of consumption to meet consumer requirements at a profit" (Kotler & Keller, 2016). Efficient marketing logistics (ML) is crucial for businesses to meet customers' needs, create value, and retain them (Uvet, 2020). Quality in ML is essential to satisfy customer expectations, ensuring products are delivered to the appropriate place, time, quantity, and cost (Barcik & Jakubiec, 2013a; Chandra & Jain, 2007; Kawa & Światowiec-Szczepańska, 2021).

Consumer behaviour (CB) is the most researched and organic branch of marketing (Dias et al., 2022; Koronios et al., 2020; William et al., 2009). According to Kotler & Keller (2016), CB is "the study of how individuals, groups and organizations select, buy, use and dispose of goods, services, ideas or experiences to satisfy their needs and wants". customer However, the present study is concentrated on the customer satisfaction (CS) because Al-Adwan et al. (2022) & Hafez et al. (2021) suggests CS forms the base for developing long-term consumer behaviour. A satisfied customer is expected to build positive relations with the retailers and establish long-term post-purchase behaviour i.e., loyalty, re-purchase, word of mouth (Caruana et al., 2016; Dias et al., 2022; Erciş et al., 2013; Jaiswal et al., 2024; Jiang et al., 2013; Kharbanda & Singh, 2022; Pham et al., 2020; Rahman et al., 2018; Tripathi et al., 2023, 2024). Hence, this particular study focuses on the satisfaction of e-shoppers as a key component of CB.

Furthermore, ML, as a crucial supporting platform not only provides a chance for network businesses to directly contact consumers but also has a great impact on CS and consumption psychology (Hua & Jing, 2015). Also, it is evident from prior studies (Dias et al., 2022; Tripathi et al., 2023) on ML that CS plays a significant role in influencing customers' choices regarding their future involvement in online shopping (Tandon, 2021) and shaping future behaviour (Erciş et al., 2013; Pereira et al., 2016).

Tripathi et al. (2023) has extensively studied the relationships between ML dimensions and CS using linear methodologies such as Partial Least Squares Structural Equation Modelling (PLS-SEM) and non-linear approaches like Artificial Neural Networks (ANN) based on Stimulus-Organism-Response (S-O-R) framework. However, these methods often fall short in addressing the complexity of real-world interactions. In practice, CS is rarely the result of a single factor but rather emerges from specific combinations of factors. The interplay between product accessibility, delivery charge, ecological packaging, reverse logistics and responsive mechanism might collectively drive satisfaction, even if these factors individually have varying levels of influence.

This study adopts fuzzy-set Qualitative Comparative Analysis (fsQCA) to bridge this gap in understanding the combination of ML factors that drive CS. fsQCA is uniquely suited to uncovering the configurational nature of causality, identifying combinations of ML dimensions that lead to high levels of CS. Unlike traditional methods, fsQCA addresses the inherent asymmetry in causal relationships, recognizing that the pathways leading to satisfaction may differ significantly from those leading to dissatisfaction.

This study provides a novel contribution to the field of e-commerce logistics by moving beyond linear analysis done by Tripathi et al. (2023) to embrace a configurational perspective. By focusing on Indian e-shoppers, it highlights the unique challenges and opportunities in this rapidly growing market, offering actionable insights for practitioners aiming to optimize logistics strategies and enhance customer experience. Thus, the present study has endeavoured to address the following research question-

RQ: Which combination of ML factors (product accessibility, delivery charge, ecological packaging, reverse logistics and responsive mechanism) may lead to high CS in online shopping in India?

The sequence of this paper is organized as follows. Section 2 follows the introduction section, which covers a review of literature and research gap. Section 3 explains the research methodology. Section 4 discusses and interprets the results of data analysis. Finally, Section 5 presents the implications, future research scope, and conclusion.

REVIEW OF LITERATURE

Marketing services and logistics were once seen as separate branches within marketing management, but a definitive differentiation between them was not evident (Drobiazgiewicz, 2018). The MGK model offers a comprehensive perspective for differentiating between these branches. Effective marketing stimulates demand for goods or services, while logistic activities facilitate their effective distribution (Ghoumrassi et al., 2017). Later, these dimensions were strategically integrated to measure their combined influence on customer service delivery (Mentzer et al., 1989). The primary objective of this integration is to attain enduring customer service, thereby facilitating the generation of sustained profits (Christopher & Peck, 2012; Drobiazgiewicz, 2018).

With amplified e-commerce operations, an extended approach of MGK model was proposed by Emerson & Grimm (1996) that combines marketing and logistics activities. Subsequently, other prominent dimensions such as reverse logistics, sales responsiveness, product accessibility, quality and green packaging were added to enrich the literature (Autry et al., 2001; Bag & Gupta, 2020; D Paço & Raposo, 2009; Harris & Martin, 2014; Lamba et al., 2020; Lambert et al., 2011; G. G. Lee & Lin, 2005; Orzan et al., 2018; Ramseook, 2012; Ribbink et al., 2004; Smith, 2005; Tripathi et al., 2023).

Effective ML enables businesses to reach geographically dispersed customers, opening doors to emerging opportunities for fostering business growth. This expands shopping options for consumers, and provides competitive advantage to businesses (Ghoumrassi et al., 2017; Mustofa et al., 2022). As a result, ML has become increasingly complex and challenging, requiring e-marketers to swiftly adapt dynamic business environment (Al-Ababneh et al., 2023; Cao et al., 2018; Jain et al., 2017; Kawa & Światowiec-Szczepańska, 2021; Smith, 2005). It is equally important for achieving organizational marketing objectives and directly affects consumers' experience. When companies deliver the right product in the right condition to the right customer at the right time and place, it can enhance CS and build a base for positive post-purchase behaviour (Cao et al., 2018; Gounaris et al., 2010; Jiang et al., 2013; Otim & Grover, 2006; Rahi et al., 2021; Tripathi et al., 2023).

2.1 Research Gap

This study aims to address the knowledge gap by exploring the effects of ML variables on CS. Despite the abundance of studies on CS in online shopping, there is a lack of direct links between ML and e-shoppers' satisfaction. Previous studies have mainly focused on reviews, buyers' attitudes, facility layouts, purchasing flexibility, shopping orientation, and retailer reputation (Riley & Klein, 2019; Hu et al., 2016; Querin, Francesco; Göbl, 2017; Zhang et al., 2005). ML components such ecological packaging, product accessibility, reverse logistics, response mechanisms, and delivery charges have received less attention.

The geographical gap is also identified, as most studies on ML and CS are conducted in developed nations with substantial online customer bases and better logistic ecosystems (Yu et al., 2016). The growth of online shoppers in developing countries, such as India, presents unique challenges for online marketers (Tandon, 2021; Tandon & Kiran, 2019).

In addition, the study also addresses the methodological gap by employing a robust fsQCA approach for qualitative comparative analysis to determine the configuration of various ML on CS. Traditional analytical methods such as PLS-SEM and ANN have provided valuable insights into these relationships (Tripathi et al., 2023), but are limited in their scope. These methods typically assume linear relationships and focus on isolated effects of variables, neglecting the possibility that multiple factors might interact in complex ways to drive outcomes. This complexity underscores the need for a configurational approach like **fsQCA**, which can identify diverse pathways to achieving CS.

India's e-commerce market presents a unique context for this analysis. With its vast geographic diversity, cultural heterogeneity, and varying levels of technological adoption, understanding the drivers of CS in this market requires a nuanced approach. fsQCA allows researchers to account for these complexities, offering insights that are both context-specific and generalizable across similar markets.

2.2 MARKETING LOGISTICS AND E-SHOPPERS' SATISFACTION

2.2.1 Product Accessibility (ACC)

The rapid growth of e-commerce has revolutionized the way people shop, providing convenience and accessibility to a wide range of products and services. Accessibility has emerged as the main driver for e-shopping (Maat & Konings, 2018). Moreover, it provides the ability to purchase goods from any location and at any time (Okamoto, 2016).

e-shopping is not bound by product search constraints and is independent of geographic distances between e-shoppers and the inventory location (Rabinovich & Bailey, 2004). Now, customers can order products from anywhere and it will be delivered at home. Mofokeng, (2021) revealed that there is a positive relation between perceived accessibility and purchase intention, indicating that accessibility can influence CS and drive higher customer loyalty. Khalaf Ahmad (2012) supported the idea that accessibility has an influence on CS, loyalty and word of mouth in the current and long run.

2.2.2 Delivery Charges (DC)

With the enormous growth in online shopping, the delivery charges attribute of logistics has gained immense significance. Delivery charges are the cost of services incurred to transport the product from the seller to the buyer location (Noble Kennedy & Kundu, 2018).

Nowadays, customers often discriminate between the price of goods and charges for delivery (Okamoto, 2016). Customers never like to pay delivery charges for the product. Generally, customers prefer free or discounted delivery. So, e-retailers should ensure reasonable, justified and equitable delivery charges (Sajitha Parveen, 2019). Indeed, evidence indicates that consumers can be more sensitive to shopping costs than the item price itself. Consumers paying higher delivery charges are anticipated to have a more negative response towards the retailers (Brynjolfsson & Smith, 2005). Perception of justifiable delivery charges is believed to influence e-shoppers' preference for retailers and influences subsequent purchase behaviour (Jones et al., 2019). Nonetheless, customers are ready to pay delivery charges to ensure speedy delivery of their products (Rajendran et al., 2018).

2.2.3 Ecological Packaging (EP)

People are spending more online with the desire for convenience and monetary value resulting from longer work life hours, less leisure time, more internet penetration and mobile ownership (Cherrett et al., 2017). As the e-commerce industry continues to grow rapidly, concerns about its environmental impacts have become increasingly significant. Sustainability has become the hot headline for marketers. Vermeir & Verbeke, (2008) defined sustainable/ecological packaging as a combination of economic, ecological and social aspects.

Ecological packaging (sustainable packaging) is believed to be non-toxic (Kharbanda & Singh, 2022) and aims to minimize the environmental footprint of packaging materials and processes, has emerged as a potential solution to address this issue. As a result, products with sustainability claims and qualities have gained popularity in recent years due to their increased value appeal to consumers (Azad & Devi, 2025). Consumers consider ecological packaging as an important element when deciding on future purchases (Kharbanda & Singh, 2022). As a result of public interest in quality of life, including the quality of the natural environment, the notion of sustainable development has become very important for governments, as well as industries (Kletzan et al., 2006). Rajendran et al., (2018) also confirmed that ecological packing plays an important role in improving consumer satisfaction and buying behaviour.

2.2.4 Reverse Logistics (RL)

American Reverse Logistics Executive Committee defined reverse logistics (RL) as "the process of retrieving the value of the product or making it appropriately handled, the process of moving the product from the consumer to the source". RL enables online shoppers to return products in compliance outlined in the return policy (E. J. Lee et al., 2020). Reverse logistics begins at the designated consumer return site and concludes at the place where the item is made available for sale or is disposed of (Risberg, 2022). Hafez et al., (2021) further elaborated RL as an important after-sale service/transaction (post-purchase) which is responsible for managing returns from customers. Cao et al., (2018) revealed that post-purchase logistic services have a strong positive correlation with CS, which subsequently impacts their re-purchase buying behaviour. It is an integral part of customer service and includes ease of making returns, the availability of a clear return policy and return fees (Cao et al., 2018). The retailer can offer a range of return options to improve CS. Customers generally prefer the quickest, cheapest and most convenient way to return an inappropriate or

faulty product (Bernon et al., 2016).

2.2.5 Response Mechanism (RM)

The growth of online retail has provided consumers with convenience, flexibility, and accessibility in their shopping experiences. The response mechanism, which includes customer service, feedback channels, and complaint resolution processes, plays a critical role in shaping consumers' perceptions and influencing their buying behaviour. The response mechanism often influences the consumers' evaluation of the product and is treated as an augmented product (Li & Huang, 2020). Marketers' prompt and satisfactory response often reduces the chances of potential customer dissatisfaction (Emerson & Grimm, 1996).

Additionally, social media platforms enable customers to publicly raise their complaints. As a consequence, marketers had to be very proactive in dealing with such instances. When complaints are resolved effectively, satisfied customers appreciate and compliment the company (Prasad et al., 2017). The artificial intelligence-induced live chat assistant interface has emerged as an increasingly popular means to provide real-time customer service (Adam et al., 2021).

S. Kim & Stoel, (2004) also revealed that an effective response mechanism plays an important role in delivering high-quality customer service (Jiang et al., 2013), which in turn enhances CS and subsequent loyalty among e-shoppers (Chang et al., 2009; Tripathi & Jaiswal, 2023). On the contrary, any ignorance or delay in addressing consumers concerns may lead to customer dissonance (Liu et al., 2008).

2.2.6 Customer Satisfaction (CS)

(Kotler, P. dan Keller, 2016) defined “customer satisfaction as a consequence of the customer’s experience during various purchasing stages”. In terms of e-com, customer satisfaction represents the accumulative impressions of an e-retailer’s performance (Chang et al., 2009). The concepts of customer satisfaction in online and offline shopping environments are quite different. It is generally assumed that online shopping platforms provide relatively additional information about the product in comparison to offline stores. This additional information allows customers to make an improved selection of products at lower prices and helps to deliver higher customer satisfaction than offline (Shankar et al., 2003). (Zaid & Patwayati, 2021) expressly revealed that customer satisfaction is the most emphasised element in marketing that plays a decisive role in market dynamics.

METHODOLOGY

3.1 Findings of PLS-SEM

By utilizing model items and results from previous study (Tripathi et al., 2023), further statistical processing is carried to find the best combination of ML resulting higher CS. The result identified that by prioritizing accessibility, e-retailers can create a positive impression and encourage repeat visits (**Figure 1**). If e-shoppers encounter barriers or difficulties receiving a product, they may become frustrated and abandon their purchase. The physical delivery of products across locations plays a crucial role in e-shoppers' satisfaction.

In addition, the finding implies that customers don’t mind paying a delivery charge if the products are delivered at the customers’ specified location by the desired time.

Ecological packaging can enhance the perceived value of a product in the eyes of e-shoppers. When packaging aligns with sustainable values and demonstrates a thoughtful approach to environmental impact, customers may associate it with higher quality and ethical standards.

Effective management of returns and repairs can also help reduce waste and minimize the environmental impact. Implementing practices such as refurbishment, reselling returned items, or recycling materials contributes to a circular economy and resonates with environmentally conscious e-shoppers. Prioritizing sustainable reverse logistics practices can enhance CS among eco-minded customers.

Clear and concise communication helps customers understand the status of their inquiries, the steps being taken to resolve their issues, and any necessary follow-up actions. Providing regular updates and ensuring that customers are informed throughout the process builds trust and reduces frustration. Tailoring customer interactions based on individual customer concerns, preferences, and purchase history can significantly impact satisfaction.

The ANN result was complied with PLS-SEM result. The most significant element that emerged was the response mechanism followed by reverse logistics. The ecological packaging achieved the second highest ranking, whereas product accessibility was identified as the least significant ML factor.

Path-analysis

H	Path	Beta	SD	T Statistics	P-Values	Support
H1	ACC -> CS	0.129	0.045	2.859	**0.004**	**YES**
H2	DC -> CS	-0.001	0.042	0.018	**0.985**	**NO**
H3	EP -> CS	0.133	0.045	2.963	**0.003**	**YES**
H4	RL -> CS	0.215	0.048	4.487	**0.000**	**YES**
H5	RM -> CS	0.409	0.036	11.257	**0.000**	**YES**
H6	CS -> RPI	0.542	0.035	15.275	**0.000**	**YES**
H7	CS -> CL	0.557	0.034	16.315	**0.000**	**YES**
H8	CS -> WOM	0.614	0.036	17.237	**0.000**	**YES**

Figure 1: PLS-SEM Result (Tripathi et al., 2023)

FUZZY-SET QUALITATIVE COMPARATIVE ANALYSIS

Fuzzy-set Qualitative Comparative Analysis (fsQCA) is a configurational analysis technique used to identify causal combinations that lead to a particular outcome (Ragin, 2008). The benefits of QCA over more conventional statistical approaches (Ragin, 2008), such as its ability to show the causal complexity of ML, led to its selection for this research. One advantage of QCA is that it makes it easier to investigate potential joint causes of various outcomes (Woodside, 2013). Secondly, this approach may disclose many configurations that might encourage ML in e-commerce industry, among other factors, and it can also discover several causal pathways that can encourage high CS. Last but not least, looking at it through the lens of set theory, QCA may determine which configurations are required or sufficient to get a certain result (Azad et al., 2024). The net result of regression analysis has significantly less obvious and transparent practical consequences than this set-theoretic analysis approach (Fiss, 2011). After careful consideration of the data type, fsQCA was chosen as the technique for doing the follow-up analysis.

4.1 Data Calibration

A continuous fuzzy scale can be utilised for outcome and predictor variables in fsQCA rather than a discrete binary scale. fsQCA encompasses 2 categories of conditions: necessary and sufficient. These configurations can either be present or absent, or there may exist a “do not care” situation. To do fsQCA, it is essential to identify the result and the independent variables. Subsequently, we standardized all metrics into fuzzy sets, with values spanning from 0, representing full non-membership, to 1, denoting full membership. The variables were converted into a calibrated set using fsQCA software, specifically version 4, adhering to the step-by-step methodology proposed by Guo et al. (2022); Pappas & Woodside (2021) & Mandal et al. (2023), which outlined a comprehensive procedure for conducting fsQCA. The calibration included establishing three significant thresholds: 0.95 for full set membership, 0.05 for full set non-membership, and 0.5 representing the crossover point. To identify the data values corresponding to the three thresholds, percentile was used to calculate the 95th, 50th, and 5th percentile of the measurements, which were then utilized as the three thresholds during the calibration of variables in fsQCA 4 software. The criteria for the 95th, 50th, and 5th percentiles averaged 4, 3, and 2, respectively. Assessing the requirements that precisely reside at 0.5 (for intermediate-set membership) is a challenge in fsQCA (Ragin, 2008). Fiss (2011) suggests that a constant of 0.001 should be added to all causative variables to address the issue of full membership scores of 1.

4.2 Truth Table

A truth table is constructed where each row signifies a distinct combination of outcome predictors, resulting in 2^n rows, where n is the number of configurations. Subsequently, the truth table was organized by frequency by arranging the ‘number’ column (Ragin, 2008). Given our sample size of 516, we established a frequency threshold of 3 (Fiss,

2011; Ragin, 2008), excluding any combinations with frequencies below this threshold from further analysis. The truth table was first sorted by frequency and then by "raw consistency," with a frequency threshold of 0.75 (Pappas & Woodside, 2021; Rasoolimanesh et al., 2023). The PRI consistency scores were also evaluated, since values below 0.5 indicate significant inconsistency (Mandal et al., 2023). Upon ranking first by frequency, then by raw consistency, and then by PRI consistency, the final solution sets were designated as 0 or 1. Selecting 0 or 1 determined if a combination elucidates the result, with '1' assigned to all combinations meeting the specified criteria and '0' assigned otherwise. The allocation of solution scores '0' and '1' is shown and elucidated by the truth table. Upon sorting the 'raw consistency' column, as seen in **Table 1**, the raw consistency scores are elevated and progressively decline, with values of 0.96816, 0.96746, 0.96503, 0.95517 and so on, followed by a natural breakpoint at the subsequent value of 0.73304. Given that all values above the consistency criterion of 0.75, we identified the value with a breakpoint as exhibiting significant inconsistency (Pappas & Woodside, 2021) and assigned it a solution score of '0', while all other values received a score of '1'. The "Standard Analysis" method was used to develop solution sets that include complicated, parsimonious, and intermediate solutions. (**Table 1**)

EP	ACC	DC	RL	RM	Number	CS	Raw consistency	PRI consistency	SYM consistency
1	1	0	0	1	8	1	0.96816	0.91818	0.91818
1	1	0	1	1	18	1	0.96746	0.93415	0.93415
0	1	1	1	1	5	1	0.96503	0.90351	0.90351
0	0	1	1	1	3	1	0.96315	0.88754	0.90012
1	1	1	1	1	164	1	0.95517	0.94005	0.96800
1	1	1	0	1	9	1	0.94950	0.88461	0.91484
1	0	1	1	1	10	1	0.94067	0.87320	0.88788
1	1	1	1	0	5	1	0.93956	0.79973	0.79973
1	0	0	1	1	6	1	0.93184	0.81916	0.81916
1	0	1	0	1	8	1	0.92007	0.79824	0.83757
1	0	1	0	0	4	1	0.91763	0.62485	0.66193
0	0	0	0	1	4	1	0.91496	0.65828	0.67327
1	0	0	0	1	7	1	0.91437	0.75000	0.75913
1	0	0	0	0	3	1	0.88750	0.44382	0.47448
0	0	1	0	0	3	1	0.86800	0.31974	0.35636
0	0	0	0	0	10	0	0.73304	0.19314	0.20150

Table 1: Truth Table

(EP: Ecological Packaging; ACC: Product Accessibility; DC: Delivery Charge; RL: Reverse Logistics; RM: Response Mechanism; CS: Customer Satisfaction)

4.3 Necessary Condition Analysis

According to (Mandal et al., 2023), the configurational approach acknowledges that it is difficult to show cause and effect since outcomes may have several interdependent causes. As it generates the result, fsQCA considers such dependency among components. There are two types of conditions: necessary and sufficient. A necessary condition is one that must be present for the outcome to occur, while a sufficient condition is one that can be achieved with any set of conditions (Ragin, 2008). The parts that follow illustrate both the necessary and sufficient criteria for the result.

The analysis of the necessary conditions is shown in **Table 2**. The study variable RM only was determined to have consistency values over 0.9, which is considered an essential requirement for marketing research (Pappas & Woodside, 2021).

Condition	Consistency	Coverage
EP	0.86099	0.84546
~EP	0.25601	0.75050
ACC	0.77681	0.88327
~ACC	0.34708	0.72305
DC	0.78359	0.84263
~DC	0.33032	0.76899
RL	0.79595	0.89065
~RL	0.35257	0.75689
RM	0.93395	0.85066
~RM	0.18544	0.70895

Table 2: Necessary Condition Analysis

4.4 Sufficient Condition

The six sets of solutions- complex, parsimonious, and intermediate consider whether a given combination is a part of the logic-based process of combination minimization in different ways. The complex solutions take into account every conceivable permutation in the evaluation. The parsimonious solutions simplify the solution by reducing it to the fewest viable alternatives, regardless of whether it is essential or not. Although the intermediate solutions have a limited number of configurations to reduce complexity, they do not contain combinations that contradict theoretical comprehension. The final solution sets were taken into account for interpreting the fsQCA findings, based on the suggested intermediate solutions. (Ragin, 2008). That is to say, sufficient solutions can provide the desired result even without the necessary conditions. The results of the fsQCA produced six potential cause condition combinations that resulted in high CS. The existence of a condition is shown in by the black circles (●), its absence by the crossed-out circles (⊗), and a "don't care" scenario, where the result is unaffected by the presence or absence of the causative factors, is represented by the blank spaces (Rasoolimanesh et al., 2023) (**Table** 4).

Frequency cutoff: 3			
Consistency cutoff: 0.867996			
Solution	**Raw coverage**	**Unique coverage**	**Consistency**
1. EP*RM	0.8208	0.1666	0.8944
2. DC*RL*RM	0.6490	0.0437	0.9345
3. EP*ACC*DC*RL	0.5646	0.0143	0.9456
4. EP*~ACC*~RL	0.2128	0.0033	0.8571
5. ~ACC*~DC*~RL*RM	0.1447	0.0049	0.8888
6. ~ACC*DC*~RL*~RM	0.0984	0.0033	0.8551
solution coverage: 0.904941			
solution consistency: 0.870694			

Table 3: Intermediate Solution

ML Construct	Configuration					
	1	**2**	**3**	**4**	**5**	**6**
ACC			●	⊗	⊗	⊗
DC		●	●		⊗	●
EP	●		●	●		
RL		●	●	⊗	⊗	⊗
RM	●	●			●	⊗

Table 4: Configurations from Sufficient Condition

Core conditions that are present in first configuration is presence of EP and RM as it is found as necessary condition for CS (**Table 3**). The second configuration exhibits presence of DC, RL and RM together delivers high CS. The third solution consists presence of EP, ACC, DC and RL. The fourth solution entails presence of EP and RL in absence ACC. The fifth solution implies presence of RM only in absence ACC, DC and RL may lead to high CS. The last solution implicates presence of DC only in absence ACC, RL and RM.

The first solution suggests that a combination of EP and a robust RM is a primary driver of CS, reflecting the increasing consumer preference for sustainable practices and efficient communication channels. This aligns with the growing emphasis on green logistics and customer-centric service in modern e-commerce.

The second pathway underscores the importance of maintaining affordable DC, effective RL systems, and an RM. This configuration highlights the critical role of cost efficiency, post-purchase convenience, and swift problem resolution in shaping positive customer experiences.

The third pathway reveals that the integration of EP, ACC, reasonable DC and RL leads to high CS. This finding reinforces the significance of providing comprehensive value across multiple ML dimensions to cater to diverse customer needs. Interestingly, the fourth configuration indicates that in the absence of ACC and RL, EP alone can still contribute to CS.

Furthermore, the fifth pathway shows that even when certain factors like ACC, DC and RL are not favourable, efficient RM can mitigate the negative impact and sustain CS.

Surprisingly sixth solution depicts that affordable and reasonable DC standalone may lead to high CS in absence of ACC, RL and RM. However, DC was identified as insignificant ML driver for CS using PLS-SEM approach (Tripathi et al., 2023).

The solution coverage for CS is 0.9049. This value indicates the solution's explanatory power, or the amount to which all configurations have covered the result. The value shows that model has strong explanatory power.

Table 3 shows that there are three main properties of causal complexity- asymmetry, equifinality, and conjunction and that different configuration routes of equally effective circumstances may reach the same outcome (Mandal et al., 2023). Equifinality, defined as the ability to accomplish the same result from several equally effective configurations of circumstances, may be defined using FsQCA rather than by analyzing each characteristic independently (Id et al., 2024).

4.5 Comparison with Previous Studies

The findings from this study provide a configurational perspective that complements and extends insights from previous research employing linear methodologies such as Partial Least Squares Structural Equation Modeling (PLS-SEM) and Artificial Neural Networks (ANN). Unlike PLS-SEM and ANN, which focus on isolated, linear, or non-linear relationships between variables, fsQCA uncovers the intricate combinations of ML dimensions that collectively influence CS.

For instance, PLS-SEM and ANN studies, such as (Tripathi et al., 2023)identified response mechanisms as the most significant factor influencing CS, followed by reverse logistics and ecological packaging. However, these methods did not account for the interdependence among variables or the potential for multiple pathways to achieve high CS. In contrast, this study reveals that while response mechanisms and ecological packaging are critical, their influence is contingent on other dimensions, such as delivery charges or product accessibility, depending on the configuration.

Moreover, traditional methods often assume symmetry in causal relationships, implying that factors leading to high CS also led to dissatisfaction when absent. FsQCA challenges this assumption by demonstrating that pathways to high CS can differ significantly from those leading to dissatisfaction, emphasizing the asymmetric nature of causality. For example, this study identifies configurations where delivery charges alone, when fair and transparent, can drive high CS, even in the absence of strong response mechanisms or product accessibility — a finding not evident in linear models.

By incorporating the principle of equifinality, this research highlights that multiple configurations of ML dimensions can achieve the same outcome. This nuanced understanding provides a more holistic view of customer satisfaction in e-commerce, offering actionable insights that go beyond the capabilities of PLS-SEM and ANN. Therefore, this

study not only bridges the methodological gap but also enhances theoretical and practical knowledge in the field of marketing logistics.

5.1 Theoretical Implications

This study advances the application of the Stimulus-Organism-Response (S-O-R) framework in e-commerce logistics by demonstrating how diverse ML dimensions interact configurationally to shape customer satisfaction. While prior research has primarily utilized the S-O-R framework to analyse linear relationships, this study extends its scope to incorporate configurational causality, providing a richer and more nuanced understanding of customer behaviour in a digitally-driven environment. This study complements complexity and configuration theory (Ragin, 2008) and the principle of equifinality (Mandal et al., 2023) from a methodological standpoint. Moreover, the study reaffirms the importance of configurational analysis in identifying solutions for achieving desirable customer outcomes, moving beyond single-variable perspectives.

Similarly, models like PLS-SEM and ANN have primarily focused on linear and non-linear relationships, but they often overlook the complexity and configurational interplay among ML dimensions. Simultaneously, methodological theories that rely on variance-based approaches do not adequately address the various ways in which reforms in policy related to ML can work together to ensure high CS. By adopting fsQCA, we complemented the study of (Tripathi et al. 2023). this research provides a novel lens to understand how different combinations of ML dimensions such as ecological packaging, product accessibility, reverse logistics, response mechanisms, and delivery charges jointly influence CS. It deepens theoretical insights into the contingent and interactional effects of ML dimensions, offering a robust framework for analyzing customer engagement dynamics in digitally driven markets like India. This contributes to bridging the theoretical gap between logistics operations and consumer behaviour in emerging markets. The fsQCA approach does all of this by providing researchers with a concentrated picture of the several possibilities that contribute to the conclusion.

5.2 Practical Implications

From a managerial perspective, the study's findings are invaluable for e-commerce firms striving to enhance CS in the competitive Indian market. The configurational insights from fsQCA highlight the importance of tailoring logistics strategies to address the diverse needs and expectations of e-shoppers. These results offer practical implications for e-commerce firms, emphasizing the need to adopt a nuanced, combinatorial approach to ML. Prioritizing EP and responsive service mechanisms can serve as foundational strategies for achieving CS, reflecting consumer expectations for sustainability and real-time issue resolution. Firms should also focus on balancing affordability of DC, convenience in RL and ACC to ensure that diverse customer segments are effectively served.

Moreover, the findings highlight the importance of flexibility in logistics strategies. E-commerce businesses can achieve CS through multiple pathways, suggesting that tailored approaches based on customer profiles or regional requirements can yield optimal results. While EP and RM are universally appreciated, the significance of RL or DC may vary depending on market conditions or customer preferences.

From strategic planning perspective, these insights underscore the need for investments in green logistics, streamlined RL systems, and advanced customer support technologies. Additionally, fostering collaboration with logistics providers to maintain cost efficiencies and scalability is critical for sustaining competitive advantage. Overall, this study contributes to a deeper understanding of the dynamic interdependencies among ML dimensions and sets a clear agenda for enhancing CS in the fast-evolving e-commerce landscape.

The study's insights can inform policymakers and industry stakeholders about the critical role of logistics infrastructure in supporting e-commerce growth. By highlighting the conditions under which ML dimensions contribute to CS, the research underscores the need for investments in technology, supply chain efficiency, and regulatory frameworks that facilitate seamless logistics operations. Additionally, it can develop guidelines that encourage efficient e-commerce operations, such as fostering technology adoption for real-time tracking and incentivizing sustainable logistics practices.

For e-commerce companies operating in India can integrate fsQCA results into their decision-making processes to navigate the complexity of ML factors. The findings offer actionable strategies for optimizing logistics operations. While this study focuses on e-commerce, the insights into marketing logistics (ML) have potential applications in other sectors as well. By focusing on actionable combinations rather than isolated factors, businesses can achieve

better operational alignment with customer expectations. Although focused on India, the findings have broader implications for other emerging markets with similar challenges and opportunities. By showcasing fsQCA's applicability to complex, culturally diverse contexts, the study provides a methodological blueprint for researchers and practitioners globally.

5.4 Future Research Scope

This study offers a robust foundation for advancing theoretical and practical understanding of sustainable ML essentials for CS in the Indian e-commerce sector. However, significant opportunities for future research remain. First, expanding the scope to include more diverse and granular ML dimensions, such as eco-friendly packaging, reverse logistics, and last-mile delivery innovations, can deepen insights into how sustainability impacts CS. Second, further research can examine the roles of cultural, technological, and regulatory factors that uniquely influence CS in emerging economies. Comparative studies across different geographies, particularly between developing and developed markets, could uncover global best practices and region-specific strategies. Additionally, future studies could adopt cross- sectional and longitudinal designs to assess the long-term impacts of sustainable ML practices on CS, loyalty, and brand advocacy.

CONCLUSION

This study underscores the critical importance of adopting a configurational perspective to explore the complex interplay of ML dimensions in driving CS of Indian e-shoppers. By leveraging fsQCA, the research highlights that achieving high CS is rarely the result of isolated factors but emerges from specific combinations of logistic attributes such as ecological packaging, product accessibility, reverse logistics, responsive mechanism and delivery charge. These insights provide actionable strategies for e-commerce firms to optimize their logistic operations while addressing the growing consumer demand for sustainability. In a rapidly evolving digital marketplace, sustainable ML represents a crucial lever for satisfying customer expectations and achieving competitive differentiation. By aligning operational strategies with customer-centric outcomes, businesses can foster long-term relationships and drive sustainable growth in the e-commerce ecosystem.

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