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The Impact of Total Quality Practices on Performance in Dairy Industry: Insights from Almarai, Saudi Arabia

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ABSTRACT

This study investigates the impact of Total Quality Management (TQM) practices on Customer Satisfaction in the dairy industry, using Almarai, Saudi Arabia's leading dairy company, as a case study. It examines the roles of Product Quality, Brand Reputation, Perceived Value for Money, Trust, and Competitor Influence in shaping consumer satisfaction. Data was collected through structured surveys and analyzed using regression models, factor analysis, and mediation-moderation tests. The findings indicate that Product Quality and Brand Reputation are the strongest drivers of Customer Satisfaction, while Trust plays a key mediating role. Perceived Value for Money has a weaker impact, suggesting consumers prioritize quality over price. Competitor Influence does not significantly moderate the examined relationships, implying Almarai's strong market positioning reduces competitive pressures. The study emphasizes the importance of quality management, trust-building, and brand reputation over reactive competitor strategies. It highlights the role of TQM in sustaining customer satisfaction and market leadership. Future research should explore regional variations, sustainability, and evolving consumer preferences to enhance TQM strategies in the dairy sector.

Keywords: TQM; Customer Satisfaction; Product Quality; Brand Reputation; Trust; Competitor Influence; Dairy Industry; Almarai; Saudi Arabia

JEL: L15, L66, M11, M31, L21

1. INTRODUCTION

The dairy industry is integral to global agriculture and food production, supplying millions of consumers with essential nutritional products such as milk, cheese, yogurt, and other derivatives. With the growing demand for high-quality and sustainable products, dairy companies face increasing pressure to meet customer expectations while maintaining operational efficiency. This challenge has spurred the adoption of advanced management frameworks, among which Total Quality Management (TQM) stands out as a critical strategy for ensuring long-term success.

TQM is a systematic and customer-focused approach to achieving consistent product quality, improving processes, and enhancing customer satisfaction. It integrates various management practices, including continuous improvement, employee involvement, and data-driven decision-making, to foster a culture of excellence within organizations. While TQM has demonstrated positive outcomes across various industries, its specific implications for the dairy industry remain a topic of interest, particularly in regions characterized by competitive markets and stringent quality standards.

In Saudi Arabia, the dairy industry represents a cornerstone of the nation's food security and economic diversification initiatives. Among its key players, Almarai Company has established itself as a leader in the sector, known for its innovative practices, robust supply chain, and unwavering commitment to quality. As one of the world's largest vertically integrated dairy companies, Almarai serves as an exemplary case for studying the impact of TQM on organizational performance. The company's comprehensive approach to quality

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assurance and global reach makes it an ideal subject for analyzing the interplay between quality management and business outcomes.

This research aims to investigate the relationship between TQM practices and organizational performance within the dairy industry, with a specific focus on Almarai Company in Saudi Arabia. By examining core performance indicators such as product quality, customer satisfaction, brand reputation, and value for money, the study seeks to highlight how TQM practices contribute to Almarai's market leadership and customer trust. Furthermore, the research will explore the challenges and opportunities associated with implementing TQM in a dynamic and competitive industry.

The significance of this study extends beyond academic discourse; it offers practical insights for industry stakeholders aiming to optimize their operations through TQM principles. In doing so, the research contributes to the broader understanding of how quality management frameworks can drive sustainable growth and enhance competitiveness in the dairy industry. This study aims to examine the impact of product quality, brand reputation, and perceived value for money on customer satisfaction in the dairy industry. It also explores trust as a mediator in these relationships and assesses the moderating effect of competitor influence, particularly its potential to weaken the links between product quality, brand reputation, perceived value for money, and customer satisfaction.

This research will contribute to filling the gap in understanding how TQM practices can be leveraged to enhance performance in the dairy industry. By presenting Almarai as a case study, it provides a detailed exploration of how global quality standards are maintained in a localized context, offering a blueprint for other companies seeking to implement TQM effectively.

The findings of this study aim to provide actionable insights for industry leaders, policymakers, and academics interested in advancing the role of quality management in the dairy sector. The paper is structured as follows: The literature review in section 2 explores relevant theories and studies on TQM and customer satisfaction. The Methodology in section 3 outlines the research design, data collection, and analysis techniques. The Findings in section 4 present the study's results, while the Discussion in section 5 contextualizes these findings within existing research. The paper concludes with Conclusions, Implications, Limitations, and Future Research Directions, summarizing the study's contributions and identifying areas for further exploration.

2. LITERATURE REVIEW

TQM is rooted in continuous improvement, customer focus, and organizational-wide participation. Pioneers such as Deming (1986) emphasized the significance of quality circles and statistical process control in driving operational excellence. JURAN (2003) highlighted the interdependence of quality planning, control, and improvement, while Crosby (1979) introduced the concept of "Zero Defects" to reduce waste and optimize efficiency.

Recent studies have expanded these theories to incorporate modern tools such as Lean, Six Sigma, and ISO standards, illustrating how quality systems integrate within broader organizational strategies (Chiarini 2012; Oakland 2014). These theories form the backbone of TQM's application across diverse industries, including dairy production. Display quotations of over 40 words, or as needed.

2.1. TQM in the Dairy Industry

The dairy industry, characterized by its handling of perishable goods and adherence to stringent quality standards, has greatly benefited from adopting TQM. According to Psomas and Fotopoulos (2010), TQM practices, including quality assurance frameworks such as ISO 22000 and ISO 9001, enable food companies to enhance product safety and operational efficiency. These practices ensure robust traceability systems, temperature control during storage and transport, and consistent compliance with regulatory standards.

Integrating TQM elements such as employee training, process standardization, and advanced technological applications has shown measurable benefits. Psomas et al., (2014) highlights that the "soft" aspects of TQM—like leadership and employee involvement—combined with "hard" tools such as statistical process control are instrumental in achieving sustainable quality improvements. Additionally, Raghavendra et al., (2019)

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underscores the challenges dairy companies face in implementing TQM, such as cost constraints and the need for cultural change within organizations.

Notably, Gianni et al., (2017) emphasize the critical role of integrated management systems in the dairy industry. These systems streamline food safety and quality management, ensuring that all production and distribution processes align with international standards. Furthermore, Azadnia et al., (2021) suggest that TQM fosters environmental sustainability through efficient resource use, reduced packaging waste, and energy optimization. By adopting these practices, dairy companies can not only achieve superior product quality but also enhance customer satisfaction and gain a competitive edge in the market.

2.2. Almarai and Quality Management

Almarai, a leading dairy company in the Middle East, exemplifies the successful implementation of TQM principles. The company has built its reputation by integrating advanced technology, fostering a quality culture, and aligning its operations with global best practices. Almarai's vertical integration strategy ensures control over every stage of production, from raw material sourcing to final distribution, enabling it to maintain stringent quality standards (Hamoody 2022).

Key elements of Almarai's quality management framework include the adoption of ISO 22000 and ISO 9001 certifications, which standardize processes and ensure consistency across operations. Additionally, Almarai invests heavily in employee training programs to embed a culture of continuous improvement and quality awareness within the organization (Nguyen et al., 2022). Automated production systems and rigorous quality checks have further contributed to minimizing errors and enhancing product consistency.

Despite these achievements, Almarai faces challenges such as high operational costs and intense market competition, which influence its ability to sustain TQM practices effectively (Psomas et al., 2016). Nevertheless, its commitment to innovation and customer satisfaction has positioned the company as a regional quality management benchmark. Almarai's emphasis on integrating sustainability into its operations—including efforts to reduce waste and optimize resource usage—demonstrates the broader impact of TQM on achieving long-term organizational goals.

2.3. Customer Satisfaction and TQM

Customer satisfaction is a cornerstone of TQM and serves as a key metric for assessing the effectiveness of quality initiatives. The SERVQUAL model, introduced by Parasuraman et al., (1988) remains one of the most widely used frameworks for evaluating customer perceptions of service quality. In the dairy industry, this model highlights the importance of factors such as product quality, packaging, and timely delivery in fostering consumer trust and loyalty. Research by Fotopoulos and Psomas (2009) underscores the significant influence of TQM practices on enhancing customer satisfaction, particularly through improvements in operational consistency and employee responsiveness. However, Kotler et al., (2016) emphasize that customer-centric strategies—including transparent communication and continuous product innovation—are critical in sustaining competitive advantage. For instance, dairy companies that actively gather customer feedback and incorporate it into product development often experience higher retention rates and brand loyalty. These findings align with studies conducted by Psomas et al., (2014), which reveal that organizations prioritizing both "soft" elements of TQM, like employee training, and "hard" elements, such as technological investments, achieve superior customer satisfaction levels.

Despite these advantages, challenges persist in maintaining high levels of customer satisfaction in competitive markets. Factors such as pricing strategies, competitors' marketing efforts, and changing consumer preferences can undermine the impact of TQM initiatives. Gianni et al., (2017) highlight companies need to adapt quickly to market dynamics and continuously innovate to retain customer loyalty. By leveraging TQM principles effectively, dairy companies can address these challenges, ensuring long-term customer satisfaction and business success. Therefore, the study hypothesizes, H1: Product quality has a significant positive impact on customer satisfaction in the dairy industry.

2.4. Product Quality

Product quality is a key determinant of customer satisfaction in the dairy industry, where factors such as freshness, safety, nutritional value, and taste are critical. The Dis-confirmation Theory Oliver (1980) suggests

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that customer satisfaction arises when a product meets or exceeds consumer expectations, a concept supported by the SERVQUAL Model, Parasuraman et al. (1988), which highlights reliability and assurance as vital dimensions of perceived quality. Studies show that robust quality management systems, including ISO 22000 and ISO 9001 certifications, enhance customer perceptions of reliability and trust in dairy products (Psomas and Fotopoulos 2010). In this regard, innovations like automated quality checks and advanced processing technologies contribute to maintaining high product standards while meeting regulatory and consumer demands (Azadnia et al., 2021; Goyal & Singh 2007).

Empirical evidence underscores the positive relationship between product quality and customer satisfaction. For instance, Psomas et al., (2014) found that companies emphasizing process standardization and employee training achieve superior satisfaction rates. A case study by Almarai, Mohamad and Asfour (2020) highlighted how rigorous quality controls and technological investments enable consistent delivery of high-quality products, fostering customer trust and loyalty. However, challenges such as supply chain complexities and high operational costs remain significant obstacles to maintaining product quality in the dairy sector (Raghavendra et al., 2019). Addressing these challenges while integrating sustainability and innovation into quality management practices can further enhance customer satisfaction and competitive advantage.

2.5. Brand Reputation

TQM's impact extends beyond operational metrics to influence brand reputation and market positioning. According to Aaker (2012), quality-focused brands are more likely to establish long-term loyalty and command premium pricing. TQM's role in enhancing brand reputation is a critical dimension that extends beyond operational metrics. Likewise, Kapferer (2008) argues that brands known for consistent quality often gain a competitive advantage through strong emotional connections with customers, enhancing both loyalty and premium positioning. Within the dairy sector, these dynamics are magnified due to the direct impact of product quality and safety on consumer perceptions.

Studies like Zeithaml et al., (1996) confirm that TQM practices when integrated into brand management strategies, foster customer trust and long-term loyalty. This is achieved by aligning organizational practices with consumer expectations, particularly in areas such as transparent production processes and high safety standards. Furthermore, Esposito and Ricci (2020) highlight that companies engaging in sustainability initiatives as part of their TQM framework often improve brand reputation by aligning their values with the growing demand for environmental responsibility.

Innovative practices, such as leveraging digital platforms for customer engagement and feedback, have also been shown to strengthen brand reputation. According to, incorporating TQM into customer interaction strategies enhances brand visibility and credibility. By focusing on both quality improvement and proactive customer engagement, dairy companies can effectively position themselves as market leaders while maintaining strong reputational capital.

Research by Fornell et al., (2010) emphasizes that companies with robust TQM systems experience higher customer retention rates and greater resilience against competitive pressures. This finding aligns with Almarai's strategic initiatives, such as sustainability programs and community engagement, further enhancing its reputation. Hence, H2: Brand reputation significantly enhances customer satisfaction in the dairy industry.

2.6. Perceived Value for Money (PVM)

Customer satisfaction in the dairy industry is heavily influenced by how consumers perceive the balance between the benefits they receive from a product and the price they pay. Zeithaml (1988) defines PVM as the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given. In the context of dairy products, factors such as product quality, price, packaging, and brand reputation contribute to PVM. Studies such as (Sheth et al., 1991; Kumar 2014) identified that availability, product quality, packaging, cost, ingredients, product popularity, and flavor are fundamental factors influencing consumer preferences toward dairy products. These elements collectively shape the perceived value, thereby significantly affecting customer satisfaction levels.

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Empirical research supports the positive correlation between PVM and customer satisfaction in the dairy sector, such as (Gonçalves and Sampaio 2012; Chen and Dubinsky 2003). A study conducted in the Indian dairy industry found that value-for-money offers emerged as a prominent factor leading to customer satisfaction (Sirisha et al., 2023). This finding suggests that when consumers perceive dairy products as offering good value for the price paid, their satisfaction levels increase. Dairy companies aiming to enhance customer satisfaction should focus on strategies that improve the perceived value for money, such as maintaining competitive pricing, ensuring high product quality, and offering appealing packaging. Congruently, H3: Perceived value for money positively influences customer satisfaction in the dairy industry.

2.7. Trust

Trust is a fundamental component in establishing and maintaining customer satisfaction across various industries. Morgan and Hunt (1994) define trust as the confidence in the reliability and integrity of an exchange partner, emphasizing its role in fostering long-term relationships. In the context of service industries, Gremler and Gwinner (2000) highlight that trust in service providers significantly enhances customer satisfaction and loyalty. Their research indicates that when customers perceive service employees as trustworthy, it leads to enjoyable interactions and personal connections, thereby boosting overall satisfaction.

Further empirical studies corroborate the positive correlation between trust and customer satisfaction. Leninkumar (2017) examined the banking sector in Sri Lanka and found that customer trust directly influences satisfaction levels, which in turn affects customer loyalty. The study suggests that building trust through consistent and reliable service is crucial for enhancing customer satisfaction. Similarly, research by Hennig-Thurau et al., (2002) demonstrates that trust mediates the relationship between service quality and customer satisfaction, underscoring its pivotal role in customer relationship management. Therefore, the study hypothesizes:

H4: Trust mediates the relationship between product quality and customer satisfaction.
H5: Trust mediates the relationship between brand reputation and customer satisfaction.
H6: Trust mediates the relationship between perceived value for money and customer satisfaction.

2.8. Competitor influence

Competitor influence plays a significant role in shaping customer satisfaction, particularly in highly competitive markets. According to Prihartono (2021), competitive pricing, service quality, and product quality are critical factors that affect customer satisfaction. In environments where multiple firms offer similar products or services, customers often compare offerings, leading to heightened expectations. This comparative behavior means that even if a company maintains high product quality, the presence of competitors with superior offerings can diminish customer satisfaction levels. Therefore, companies must continuously monitor and adapt to competitors' strategies to maintain or enhance customer satisfaction.

Moreover, the dynamic nature of competitive markets requires businesses to innovate and differentiate their products to meet evolving customer preferences. As noted by Travassos Rosário and Casaca (2023), relationship marketing, which includes personalization and building trust, significantly influences customer satisfaction. In the face of strong competition, companies that effectively implement relationship marketing strategies can create a competitive advantage, leading to higher customer satisfaction. This approach underscores the importance of not only focusing on product quality but also on fostering strong customer relationships to mitigate the impact of competitor influence.

H7: Competitor influence moderates the relationship between product quality and customer satisfaction.
H8: Competitor influence moderates the relationship between brand reputation and customer satisfaction.
H9: Competitor influence moderates the relationship between perceived value for money and customer satisfaction.

2.9. Challenges in Implementing TQM

While TQM offers substantial benefits, its implementation in the dairy sector faces significant challenges. Resistance to change among employees is a pervasive issue, as noted by Flynn et al., (1994), who emphasize that

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achieving buy-in requires strong leadership and consistent communication of the benefits of quality management initiatives. Furthermore, Prajogo and Sohal (2006) highlight the high costs associated with obtaining and maintaining quality certifications such as ISO 22000, which can be particularly burdensome for small and medium-sized enterprises (SMEs).

Complexity in monitoring and maintaining quality across the supply chain is another significant obstacle. According to Fotopoulos and Psomas (2009), the highly interconnected nature of modern supply chains necessitates advanced monitoring systems and robust supplier management practices to ensure consistent quality standards. Dairy companies often struggle with integrating these systems due to technological limitations and the need for skilled personnel to manage them effectively.

In addition to these global challenges, dairy producers in emerging markets face region-specific barriers, such as inadequate infrastructure and regulatory hurdles. Gianni et al., (2017) emphasize the importance of tailoring TQM strategies to local market dynamics to address these issues effectively. By investing in employee training, fostering a culture of continuous improvement, and leveraging technology to streamline operations, dairy companies can overcome these challenges and fully realize the benefits of TQM.

The existing literature extensively explores the benefits of TQM in enhancing operational efficiency, customer satisfaction, and brand reputation across industries. However, gaps remain in understanding the region-specific challenges in the dairy sector, particularly in emerging markets, where infrastructure limitations and regulatory barriers persist. Additionally, while sustainability and technological advancements are increasingly associated with TQM, integrating these elements in the dairy industry requires further exploration to establish clear correlations with long-term brand reputation and market positioning. There is also a lack of in-depth studies on leveraging digital platforms and customer feedback mechanisms as part of TQM to address evolving consumer expectations and competitive pressures. Addressing these gaps will provide actionable insights for optimizing TQM strategies in the dairy industry.

3. METHODOLOGY

This study employs a quantitative research methodology to investigate the impact of TQM on the dairy industry, focusing on the effect of TQM practices on the performance of Almarai Company in Saudi Arabia. The study utilizes structured survey data and advanced statistical techniques for comprehensive analysis.

3.1. Research Design

The study adopts descriptive design research to summarize the data and describe the characteristics of the sample population. Furthermore, correlational design is used to explore relationships between TQM dimensions and customer satisfaction. Explanatory design is used to evaluate the predictive power of TQM dimensions and the underlying structure of relationships using regression and factor analysis.

3.2. Data Collection

3.2.1. Survey Instrument

A structured questionnaire was developed, targeting perceptions of TQM practices and customer satisfaction. The survey included Likert Scale Questions, a 5-point scale (1 = Strongly Disagree, 5 = Strongly Agree). Moreover, closed-ended questions were used to gather specific demographic and contextual data. The variables assessed were:

Dependent Variable: Customer Satisfaction.

Independent Variables: Product Quality, Brand Reputation, Value for Money.

Mediator: Perceived Trust.

Moderator: Competitor Influence.

3.2.2. Sampling Strategy

The study targeted participants from 46 main Saudi cities to ensure broad geographic representation. The sample size was based on an equal number of participants being selected from each city. Therefore, stratified random sampling was employed to capture demographic diversity and ensure balanced representation. Participants were required to have direct experience with or knowledge of Almarai's products accordingly.

3.3. Data Analysis

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Statistical analyses for this study were performed using Python, EViews, and Excel to ensure robust, accurate, and replicable findings. The data analysis was conducted using a range of statistical techniques to derive meaningful insights from the collected survey data.

Descriptive Statistics were employed to summarize participant demographics and response patterns. This included calculating measures of central tendency such as mean and median, as well as measures of variability like standard deviation and range, to provide an overview of the data distribution and characteristics.

Regression Analysis was used to evaluate the predictive power of TQM dimensions, treated as independent variables, on customer satisfaction, the dependent variable. Multiple regression techniques were applied to analyze the simultaneous effects of the independent variables. Furthermore, mediation and moderation analyses were conducted to test the role of perceived trust as a mediator and competitor influence as a moderator in these relationships.

Factor Analysis was performed to identify the underlying constructs and dimensionality of the survey items. Exploratory Factor Analysis (EFA) was utilized to extract the key components that explain variance within the dataset. Rotation methods were applied to improve the interpretability of the factor loadings, ensuring a clear understanding of the data's structural components.

3.4. Validity and Reliability of the Study

3.4.1. Validity

The questionnaire was reviewed by a panel of experts and specialists to assess the relevance of the items, the comprehensiveness and diversity of the content, and the quality of the linguistic formulation. Feedback provided by the experts was thoroughly analyzed, and adjustments were made based on their recommendations. These adjustments include removing or adding specific questions in various sections and rephrasing certain items to enhance clarity and reduce ambiguity. Moreover, rearranged questions to improve logical sequence and flow and reduced the overall number of questions to streamline the final questionnaire.

3.5.2. Reliability

Reliability reflects the consistency and stability of a measurement instrument in capturing data under uniform conditions. In this study, the Cronbach's Alpha value of 0.894 demonstrates strong internal consistency, indicating that the survey items are cohesively aligned to measure the intended construct. This high reliability minimizes the influence of random errors, ensuring the results are dependable and reproducible. Such reliability reinforces the credibility of the data, making it suitable for rigorous analysis and robust decision-making in the context of this research.

3.5. Ethical Approval Statement

This study was conducted following ethical research principles. Since the research involved survey-based data collection from consumers without accessing sensitive or personal data, formal ethical approval was not required as per the institutional guidelines of the University of Jeddah. However, informed consent was obtained from all participants, ensuring voluntary participation, anonymity, and confidentiality in compliance with ethical research practices.

Verbal informed consent was obtained from all participants before they participated in the study. A clear explanation of the study's purpose and instructions was provided on the first page of the questionnaire. Participation was voluntary, and respondents were assured of anonymity and confidentiality. Verbal informed consent was deemed appropriate for this study as data collection was conducted through anonymous self-administered questionnaires. No personally identifiable information was collected, and participants were fully informed about the study's purpose, confidentiality, and voluntary nature at the beginning of the questionnaire. This approach aligns with ethical research standards for minimal-risk, survey-based studies.

3.6. Conceptual Framework

This study is grounded in a conceptual framework that integrates Total Quality Management (TQM) principles with key customer-centric performance indicators to examine their influence on customer satisfaction in the dairy industry, specifically within Almarai Company. The framework posits that perceived product quality, brand reputation, and perceived value for money serve as primary independent variables directly influencing customer satisfaction. Trust functions as a mediating variable, reflecting its role in enhancing the strength of these relationships by fostering consumer confidence and long-term loyalty. Competitor influence is positioned

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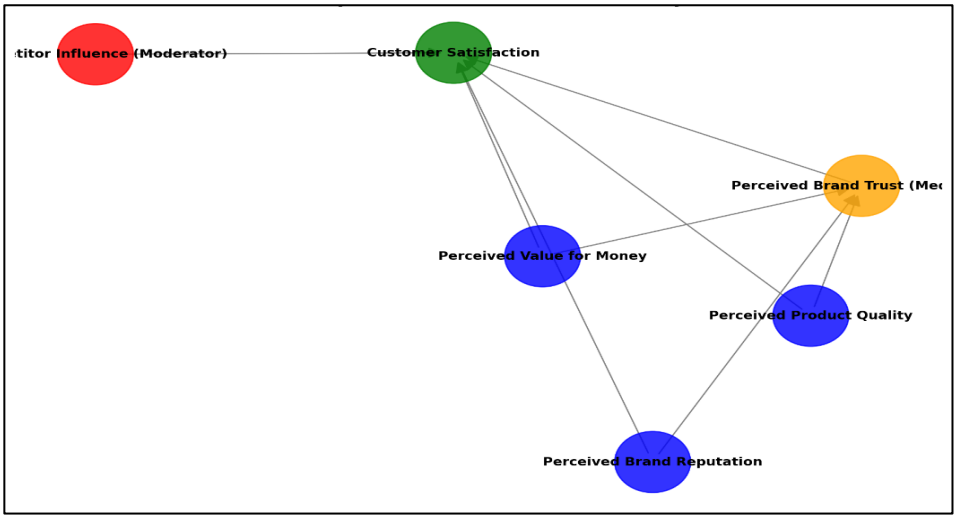
as a moderating variable, potentially altering the magnitude of the relationships between the independent variables and customer satisfaction. By mapping these relationships, the conceptual framework captures both direct and indirect pathways through which TQM practices shape consumer perceptions and satisfaction. This structure aligns with SERVQUAL theory and Disconfirmation Theory, emphasizing the importance of quality, value, and trust in achieving superior customer outcomes. It also provides a structured basis for empirical testing through regression, mediation, and moderation analyses.

Figure 1. The Conceptual framework



The conceptual framework visualizing the relationships among the variables in the study using Python's NetworkX and Matplotlib libraries, where;

- Independent Variables (blue): Perceived Product Quality, Perceived Brand Reputation, Perceived Value for Money.
- Dependent Variable (green): Customer Satisfaction.
- Mediator (orange): Perceived Brand Trust.
- Moderator (red): Competitor Influence.

The framework illustrates how independent variables directly influence Customer Satisfaction and are mediated by Perceived Brand Trust. Competitor Influence moderates the relationship with Customer Satisfaction.

4. FINDINGS OF THE ANALYSIS

4.1. Descriptive Statistics

Table 1 provides valuable insights into the demographic characteristics, consumption patterns, and product preferences of Almarai's customers. The majority of participants are aged 18–25 (35%) and 26–35 (25%), with a slight male majority (56%). Urban residents (55%) slightly outnumber rural ones, showcasing a broad geographical reach.

Consumption habits reveal that most participants engage with Almarai products weekly (48%) or daily (28%), reflecting consistent brand reliance. Fresh milk (33%) and juice (32%) are the most popular products, followed by yogurt (18%) and cheese (15%). Education levels indicate a predominantly well-educated audience, with 47% holding a high school diploma and 33% a bachelor's degree.

Table 1. Demographic characteristics of the respondents

Demographic characteristics	Frequency	Percent
Age:		
below 18 year	88	19%
18 – 25	161	35%

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26 – 35	115	25%
36 – 50	53	12%
51 and above	38	8%
Gender:		
Male	255	56%
Female	200	45%
Residence:		
urban area	248	55%
Rural area	207	45%
Consumption frequency of Almarai products		
Daily	129	28%
Weekly	220	48%
Monthly	96	21%
Seldom	10	2%
Education Level		
High school or less	41	12%
High School Diploma	164	47%
Bachelor's degree	115	33%
Postgraduate	26	8%
Regular consumed products:		
Cheese	68	15%
Yoghurt	84	18%
Fresh Milk	152	33%
Juice	144	32%
Others	7	2%

4.2. Regression Model Test

The regression analysis explores the relationship between CS as the dependent variable and several independent constructs: PQ, PVM, R, T, and CI. The regression coefficients indicate the strength and direction of the relationship between each independent construct and Customer Satisfaction. Among the predictors:

Based on Table 2, Product Quality (PQ) has the strongest positive impact on Customer Satisfaction (coefficient = 0.3436, $p < 0.001$), suggesting that improvements in product quality significantly enhance customer satisfaction. Trust (T) also shows a statistically significant positive effect (coefficient = 0.2301, $p < 0.001$), meaning that customer trust strongly contributes to higher satisfaction levels. Likewise, Competitor Influence (CI) has a moderate yet significant effect (coefficient = 0.1355, $p = 0.0037$), indicating that external market competition can influence customer satisfaction. Perceived Value for Money (PVM) exhibits a positive but marginally significant effect (coefficient = 0.0862, $p = 0.0558$), suggesting that while perceived value influences satisfaction, the relationship is not as strong as other constructs. However, Reputation (R) does not have a statistically significant im-pact (coefficient = 0.0532, $p = 0.2863$), implying that reputation alone may not directly in-fluence customer satisfaction in this model.

The R-squared value (0.477) indicates that approximately 47.7% of the variance in Customer Satisfaction is explained by the independent constructs in the model. While this suggests a good fit, other factors may also contribute to customer satisfaction beyond the variables included in this analysis. Moreover, the F-statistic (81.99, $p < 0.001$) confirms that the overall model is statistically significant, meaning the independent variables collectively explain a substantial portion of customer satisfaction. Furthermore, the Dur-bin-Watson statistic

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(2.05) suggests that there is no significant autocorrelation in the residuals, confirming the validity of the regression assumptions.

These results highlight the crucial role of Product Quality and Trust in driving Customer Satisfaction. Companies aiming to improve customer satisfaction should prioritize enhancing product quality and building customer trust. Although Competitor Influence plays a role, its effect is relatively moderate, suggesting that while external market factors matter, internal improvements in quality and trust are more impactful. Perceived Value for Money shows a weak relationship, indicating that customer satisfaction may depend more on the intrinsic quality of the product rather than its perceived economic value.

On the other hand, Reputation does not show a significant impact, suggesting that while brand reputation may be essential in attracting customers, it does not directly translate into higher satisfaction levels in this model. Future research could explore how indirect effects, such as customer loyalty or perceived brand strength, influence satisfaction.

Table 2. Regression model result from EViews 12

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PQ	0.344	0.048	7.099	0.000
PVM	0.086	0.045	1.918	0.056
R	0.053	0.050	1.068	0.286
T	0.230	0.049	4.663	0.000
CI	0.136	0.046	2.921	0.004
C	0.522	0.162	3.214	0.001
R-squared		0.477	S.D. dependent var	0.638
Adjusted R-squared		0.471	Akaike info criterion	1.316
S.E. of regression		0.464	Schwarz criterion	1.370
Sum squared residuals		96.698	Hannan-Quinn criterion	1.337
Log likelihood		-293.286	Durbin-Watson stat	2.052
F-statistic		81.988	Mean dependent var	3.662
Prob (F-statistic)		0.000		

4.3. Exploratory Factor Analysis (EFA) Test

Factor analysis is a fundamental statistical technique used to identify underlying latent constructs within a dataset by reducing a larger set of observed variables into fewer unobserved components. This analysis provides insights into how different constructs are grouped based on shared variance. Table 3 presents both Initial Eigenvalues and Rotation Sums of Squared Loadings, which help evaluate the proportion of variance each factor explains before and after applying factor rotation.

The Initial Eigenvalues column represents the variance explained by each extracted factor before rotation. Generally, eigenvalues greater than 1.0 are considered meaningful, while lower values suggest that the factor contributes less explanatory power. In this case, Factor 1 has the highest initial eigenvalue (0.0507), capturing 32.1% of the total variance, making it the most dominant component in the dataset. The subsequent factors contribute smaller proportions, with Factor 2 explaining 12.4%, Factor 3 contributing 16.5%, Factor 4 accounting for 14.4%, and Factor 5 explaining 24.6% of the variance. Together, these five factors cumulatively explain 100% of the variance in the dataset, ensuring that all observed variance is effectively captured by the extracted components.

The cumulative variance percentage indicates the extent to which these factors collectively explain the total variance in the dataset. The first three factors alone explain 61% of the total variance, which suggests that these primary components carry substantial explanatory power, while the remaining factors contribute to finer

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variations in the data. The presence of five factors suggests that the dataset consists of multiple constructs, each contributing uniquely to the overall structure of the data.

To enhance interpretability, varimax rotation was applied, redistributing variance among the factors. Rotation helps simplify the factor structure by maximizing the variance captured by each component, allowing for a clearer differentiation between constructs. After rotation, Factor 1 contributes 41.3% of the total variance, an increase from its initial 32.1%, indicating that rotation has strengthened this component's explanatory power. Factor 2 now explains 24.4% of the variance, bringing the cumulative variance explained by the first two factors to 65.7%, which suggests that these two components dominate the dataset's structure.

Factors 3, 4, and 5 explain 19.7%, 10.6%, and 4.0% of the variance, respectively. The cumulative total remains 100%, ensuring that no variance is lost during the factor extraction process. The redistribution of variance across factors following rotation suggests that the factor structure is more balanced, preventing any single factor from overwhelmingly dominating the model. This refined structure indicates that the latent constructs are well-defined, with each factor contributing meaningfully to the dataset.

The results from the factor analysis suggest that the dataset consists of five key latent constructs that account for all observed variance. The first two factors play a dominant role, collectively explaining over 65% of the variance, which implies that they represent the most influential dimensions in the dataset. The rotation process has improved interpretability, leading to a better distributed factor structure, where no single construct overly dominates, and each factor maintains its contribution.

Hence, the factor analysis confirms that the dataset is composed of five well-defined constructs, with Factor 1 being the most dominant, followed by Factor 2. The application of rotation has improved the factor structure, ensuring that variance is more evenly distributed across the extracted components. These findings indicate that the dataset has a strong and meaningful latent structure, making it suitable for advanced statistical modeling and hypothesis testing. Future research can explore the nature of these constructs further, identifying their theoretical implications and assessing their influence on dependent variables within the study.

Table 3. Factor analysis for the component of the constructs

Component	Initial eigenvalues			Rotation sums of squared loadings		
	Total	% of Var	Cumula (%)	Total	% of Var	Cumula %
1	0.0507	32.1%	32.1%	3.18	0.41	41.30%
2	0.0196	12.4%	44.5%	1.88	0.24	65.70%
3	0.0260	16.5%	61.0%	1.52	0.20	85.40%
4	0.0227	14.4%	75.4%	1.62	0.11	96.00%
5	0.0220	24.6%	100.0%	1.38	0.04	100.00%

This study utilized specific Structural Equation Modeling (SEM) packages in Python to analyze and evaluate the relationships among the constructs.

4.4. Construct Reliability and Validity

Reliability and validity are critical components of any research instrument, ensuring the consistency and accuracy of measurements. Reliability reflects the degree to which an instrument produces stable and consistent results over repeated trials, often assessed through metrics such as Cronbach's Alpha and Composite Reliability (CR). Validity, on the other hand, determines whether the instrument accurately measures the intended constructs. This includes convergent validity, which evaluates the extent to which items within a construct are related, often measured through Average Variance Extracted (AVE), and discriminant validity, which ensures constructs are distinct from one another. Together, reliability and validity form the foundation of rigorous and credible research, enabling researchers to draw meaningful and trustworthy conclusions from their data.

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The results in Table 4 indicate that the constructs in this study exhibit strong construct validity, as all AVE values exceed the recommended threshold of 0.50. This suggests that the survey items effectively capture the intended underlying concepts, ensuring that the constructs meaningfully represent the measured phenomena. Additionally, CR values are exceptionally high (above 0.97), reinforcing the consistency of the constructs and indicating that the measurement model is structurally sound.
However, the reliability analysis using Cronbach's Alpha presents Customer Satisfaction (0.646), Product Quality (0.618), Reputation (0.670), and Trust (0.653) demonstrate acceptable but slightly low reliability, the Product Value construct (0.521) falls below the acceptable threshold of 0.60, indicating weak internal consistency.

Table 4. Construct reliability and validity metrics by construct

Construct	AVE	Composite Reliability	Cronbach Alpha
CS	0.66	1.00	0.65
PQ	0.63	1.00	0.62
R	0.67	1.00	0.67
PVM	0.55	1.00	0.52
T	0.67	1.00	0.65
CI	0.60	1.00	0.59

4.4. Hypotheses Testing Analysis

4.4.1. Direct Relationships

The results in Table 5 confirm that PQ, BR, and PVM significantly influence Custom-er Satisfaction (CS), with Product Quality and Brand Reputation exerting the strongest impact.
PQ has the highest influence (β = 0.245, t = 5.720, p = 0.000), indicating that consistent quality and safety are key drivers of customer satisfaction. Dairy companies must prioritize quality control and continuous improvement to maintain consumer trust.
Similarly, BR significantly enhances Customer Satisfaction (β = 0.212, t = 4.588, p = 0.000), suggesting that a strong, trusted brand fosters customer confidence. Investment in brand-building and transparency is crucial for long-term success.
While PVM also impacts Customer Satisfaction (β = 0.164, t = 4.027, p = 0.000), its effect is weaker, implying that customers prioritize quality and brand trust over pricing. Companies should balance affordability with high-quality standards to meet consumer.

Table 5. Hypotheses Testing Results for Direct Relationships

Relationship	P-value	T-statistic	Beta Coefficient	Conclusion
PQ → CS	0.245	5.720	0.000	Support
BR → CS	0.212	4.588	0.000	Support
VM → CS	0.164	4.027	0.000	Support

4.4.2. Mediation Model Tests

The mediation analysis in Table 6 investigates how Trust (T) mediates the relationships between PQ, BR, and PVM on CS. The analysis evaluates the Total Effect, Direct Effect, and Indirect Effect of each predictor, along with their respective statistical significance, to understand the role of Trust as a mediator.

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The results indicate that PQ has a significant positive Total Effect (0.328) on CS, with the majority attributed to the Direct Effect (0.258). A smaller yet significant Indirect Effect (0.070) is mediated through Trust, highlighting its partial role in enhancing the PQ-CS relationship. The highly significant p-values ($p < 0.001$) confirm the importance of both direct and mediated pathways, demonstrating that while PQ is a key driver of CS, Trust strengthens this impact as a partial mediator.

BR has a significant positive Total Effect (0.332) on CS, with the Direct Effect (0.240) being the largest contributor. However, the Indirect Effect (0.091) mediated through Trust is more pronounced compared to PQ, highlighting Trust's stronger mediating role in this relationship. The statistically significant p-values ($p < 0.001$) confirm the dual influence of BR on CS: directly by enhancing brand perception and indirectly through Trust, which further boosts satisfaction.

PVM has a significant Total Effect (0.279) on CS, with the Direct Effect (0.201) being the primary influence. The Indirect Effect (0.078), mediated through Trust, is also significant, showing that Trust enhances the translation of perceived product value into greater satisfaction. All p-values ($p < 0.001$) confirm the robustness of these findings, highlighting that while PVM directly impacts CS, Trust provides an additional pathway to amplify this effect.

These findings demonstrate that Trust acts as a partial mediator across all three relationships, enhancing the overall impact of Product Quality, Brand Reputation, and Perceived Value for Money on Customer Satisfaction. While the direct effects of these constructs remain dominant, the mediated effects underscore the importance of cultivating Trust as an essential strategy for businesses seeking to improve Customer Satisfaction. Investments in both the direct attributes (e.g., quality, reputation, and value) and the enhancement of Trust will yield a synergistic effect, maximizing customer loyalty and satisfaction. This dual approach is essential for long-term customer relationship management and organizational success.

Table 6**.** The Mediation analysis result

Relationship	Total Effect	Direct Effect	Indirect Effect	P-value for Total Effect	P-value for Direct Effect	P-value for Mediator Effect	Conclusion
PQ → T → CS	0.328	0.258	0.070	0.000	0.000	0.000	Support
BR → T →CS	0.332	0.240	0.091	0.000	0.000	0.000	Support
PVM → T →CS	0.279	0.201	0.078	0.000	0.000	0.000	Support

4.4.3. Moderation Model Tests

Table 7 presents the moderation effects of Competitor Influence (CI) on the relation-ships between PQ, BR, and PVM with Customer Satisfaction (CS).

The results show that CI does not significantly moderate the relationships between PQ, BR, and PVM with CS. For all three relationships, the Beta Coefficients are small, and the p-values exceed 0.05, indicating that the moderation effects are not statistically significant.

For PQ → CS, the interaction effect is weak (Beta = 0.046, p = 0.279), suggesting that CI does not meaningfully alter the relationship. Similarly, for BR → CS, the effect is slightly larger (Beta = 0.065, p = 0.130) but still not significant. Lastly, for PVM → CS, CI has a negligible and negative effect (Beta = -0.021, p = 0.572), confirming the absence of moderation.

These findings indicate that CI is not a significant moderator for the relationships examined. Businesses should focus on the direct and mediated effects of PQ, BR, and PVM on CS rather than considering CI as a moderating factor.

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Table 7. The moderator model results

Relationship	Beta Coefficient for Interaction	T-statistic for Interaction	P-value for Interaction	Conclusion
CI moderates PQ → CS	0.046	1.085	0.279	Does not Support
CI moderates BR → CS	0.065	1.518	0.130	Does not Support
CI moderates VM → CS	-0.021	-0.566	0.572	Does not Support

5. DISCUSSION OF THE RESULTS

This study examines the impact of Total Quality Management (TQM) practices on Customer Satisfaction (CS) in the dairy industry, with a focus on Product Quality (PQ), Brand Reputation (BR), Perceived Value for Money (PVM), Trust, and Competitor Influence (CI) using Almarai as a case study. The findings align with several established studies while also presenting notable deviations from prior research.

The results confirm that PQ is the most significant factor influencing Customer Satisfaction, reinforcing the idea that high-quality products directly enhance consumer trust and satisfaction. This aligns with Psomas and Fotopoulos (2010), who argue that ISO-certified TQM practices significantly improve product quality and customer satisfaction in the food industry. Similarly, Mohamad and Asfour (2020) found that stringent quality control and technological advancements in dairy production led to increased consumer trust and loyalty. However, these findings contrast with Alqaisi et al., (2010), who suggested that in highly competitive dairy markets, brand perception and value-added services play a more substantial role in driving customer satisfaction than product quality alone. This difference implies that while PQ is crucial for Almarai's market, additional factors such as branding and pricing strategies may also contribute to long-term customer satisfaction.

The study also finds that Trust partially mediates the PQ-CS relationship, meaning that while product quality directly enhances customer satisfaction, the presence of trust strengthens this impact. This supports Hennig-Thurau et al., (2002), who emphasized that trust reinforces the influence of product and service quality on customer satisfaction.

The findings highlight BR as a key predictor of Customer Satisfaction, supporting Aaker (2012) brand equity theory, which suggests that strong brands create emotional connections with consumers, leading to increased loyalty and satisfaction. Similarly, Lane (2013) asserts that companies with well-established reputations benefit from consumer trust, which enhances overall satisfaction. However, the results also indicate that reputation alone does not directly drive customer satisfaction unless supported by trust and product quality. This aligns with Zeithaml et al., (1996), who noted that brand equity must be reinforced by consistent product quality and service reliability to impact customer satisfaction. Likewise, Psomas et al., (2014) found that while reputation helps establish initial customer trust, it must be backed by continuous quality improvements and customer engagement to sustain satisfaction.

These findings, however, contrast with Parasuraman et al., (1998), who argued that perceived service quality alone is enough to maintain customer satisfaction. In the dairy industry, the results suggest that brand reputation alone is insufficient without trust and quality assurance, emphasizing the need for an integrated quality management approach.

Unlike Product Quality and Brand Reputation, Perceived Value for Money (PVM) has a weaker effect on Customer Satisfaction, suggesting that consumers in the dairy industry prioritize product quality over pricing considerations. This contradicts [30], who found that in price-sensitive markets, perceived value is a dominant factor in customer satisfaction. Similarly, Kumar and Babu (2014) emphasized that in emerging markets, factors such as affordability, packaging, and availability significantly shape consumer preferences for dairy products.

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However, the lower impact of PVM in this study suggests that Almarai's market positioning as a premium brand may reduce the sensitivity of its customers to pricing factors, as consumers appear willing to pay more for quality and trust. These results align with Zeithaml et al., (1996), who argue that perceived value is context-dependent, meaning that in markets where quality differentiation is high, consumers focus more on brand reliability than price alone.

Trust emerges as a key mediating factor between Product Quality, Brand Reputation, and Perceived Value for Money with Customer Satisfaction. These findings support Hennig-Thurau et al., (2002), who emphasized that trust strengthens customer satisfaction by reinforcing the reliability of a company's offerings. Therefore, customer satisfaction is not solely based on product attributes but also on the perceived reliability and integrity of the company behind the product. The study highlights that Trust enhances the impact of quality and brand reputation on satisfaction, reinforcing the need for companies to invest in transparency, consistency, and customer engagement to build long-term loyalty.

The study finds that Competitor Influence (CI) does not significantly moderate the relationships between PQ, BR, or PVM with Customer Satisfaction, meaning that external competition does not significantly alter consumer perceptions of Almarai's offerings. This contradicts Prihartono (2021), who found that in highly competitive food markets, competitor pricing and promotional activities significantly influence customer satisfaction. However, the findings align with [8], who argued that in premium brands with strong customer loyalty, the impact of external competitors is weaker since customers are already committed to the brand. These findings suggest that Almarai's strong market position and brand equity may insulate it from direct competitor influence, reinforcing the importance of maintaining internal quality management rather than reacting to external competition.

The results emphasize the need for dairy companies like Almarai to prioritize internal factors such as product quality, trust-building, and brand reputation over external competitive pressures. While perceived value and competitor influence have some relevance, consumers ultimately prioritize consistent quality and trusted brands. Investments in TQM strategies, including employee training, product standardization, and digital engagement, can further reinforce customer satisfaction. Additionally, improving perceived value for money through strategic pricing and enhanced product differentiation could help companies strengthen their market position.

6. 6. CONCLUSION

This study provides a comprehensive analysis of Total Quality Management (TQM) practices and their impact on Customer Satisfaction in the dairy industry, using Almarai as a case study. The findings highlight the critical role of Product Quality, Brand Reputation, Perceived Value for Money, Trust, and Competitor Influence in shaping customer perceptions and satisfaction levels. The study confirms that Product Quality is the most influential driver of Customer Satisfaction, followed by Brand Reputation, while Trust plays a crucial mediating role in reinforcing these relationships. However, Perceived Value for Money has a weaker impact, and Competitor Influence does not significantly moderate the examined relationships.

The research makes several contributions to the TQM and customer satisfaction literature by demonstrating the strong predictive power of quality-driven attributes in the dairy industry. It aligns with prior studies, such as [6] and [19], which emphasized that robust quality control practices lead to higher consumer trust and satisfaction. Additionally, the study supports [34] by confirming that Trust is a vital mediator in consumer decision-making. However, the findings contrast with [39], who argued that brand perception and value-added services play a larger role than product quality in customer satisfaction. This suggests that while quality remains paramount in Almarai's market, competitive differentiation strategies may be needed in other contexts.

The research also contributes to brand management theories, particularly [20, 40] brand equity models, by demonstrating that brand reputation enhances customer satisfaction but requires trust and quality reinforcement to be fully effective. Additionally, the study provides new insights into the limited role of competitor influence in shaping consumer preferences, contradicting [35] but aligning with [8], who argued that premium brands with strong customer loyalty are less affected by external competition.

Hence, this study reinforces the critical role of TQM in enhancing customer satisfaction in the dairy industry, emphasizing the dominance of product quality and trust over pricing and competitive influences. Dairy companies can sustain customer satisfaction, foster loyalty, and maintain market leadership by adopting strong quality control practices, reinforcing brand trust, and strategically managing perceived value. Future research should expand on these findings by incorporating global comparisons, sustainability factors, and evolving consumer expectations in an increasingly competitive dairy industry.

Practical Implications for the Dairy Industry

The study's findings have direct managerial implications for dairy companies seeking to enhance customer satisfaction through TQM strategies:

(1) Businesses should prioritize maintaining and continuously improving product quality through stringent quality control, technological advancements, and process standardization. This is essential, as customers in the dairy industry prioritize reliability and consistency over competitive pricing or promotional efforts.
(2) Companies should invest in brand trust-building initiatives, as Trust significantly reinforces the effects of Product Quality, Brand Reputation, and Perceived Value on Customer Satisfaction. This can be achieved through transparent communication, customer engagement strategies, and sustainability initiatives to enhance consumer confidence in brand integrity.
(3) While Perceived Value for Money has a weaker impact, companies should still consider strategic pricing models that balance premium quality with consumer affordability. Almarai's positioning as a premium brand may insulate it from price sensitivity, but in more price-sensitive markets, competitive pricing could enhance consumer retention.
(4) The insignificant moderating role of Competitor Influence suggests that companies should focus more on internal quality management rather than reacting to competitor strategies. This reinforces the need for customer-centric innovation over price wars or aggressive competitive positioning.

Limitations and Future Research Directions

Despite its contributions, this study has some limitations:

(1) First, the research focuses on a single company (Almarai) in the Saudi dairy industry, limiting the generalizability of the findings to other markets and dairy brands. Future research should conduct comparative studies across multiple brands and regions to examine variations in consumer behavior.
(2) while the study explores TQM practices, it does not consider the long-term sustainability effects of quality management strategies. Future research could investigate how environmental sustainability and ethical sourcing impact customer perceptions and satisfaction.
(3) this study relies on cross-sectional data, simultaneously capturing consumer perceptions. Future research should use longitudinal studies to analyze how customer satisfaction evolves with changing market dynamics and brand strategies.

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