

Service Quality and Sustainability: A Hybrid Framework for Malaysian Urban Consumers in Food and Beverage and Retail

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ABSTRACT

This paper extends the SERVQUAL framework by incorporating environmental sustainability as a sixth dimension to evaluate its role in shaping consumer satisfaction and responsible consumption in Malaysia's urban food and beverage (F&B) and retail sectors. This study adopted a quantitative approach by conducting survey on 200 Malaysian urban consumers. The data collected was analyzed using structural equation modelling (SEM). All participants gave electronic consent and joined voluntarily. According to the results obtained, sustainable behaviour such as ethical sourcing and waste reduction, have the most significant impact on customer satisfaction compared to traditional service quality variables. The findings suggest that consumer decision-making within emerging markets is strongly influenced by eco-conscious values. These findings provide strategic direction for managers and policymakers looking to integrate operational excellence with environmental responsibility, fostering competitiveness and advancing national sustainability agendas. This study provides an original theoretical extension which links the sustainable consumption with service quality by integrating sustainability into SERVQUAL framework. It complements Sustainable Development Goals 11 and 12 and offers empirical data from Malaysia, an understudied environment.

Keywords: Service Quality, Sustainable Consumption, SERVQUAL Framework, Food and Beverage Industry, Environmental Sustainability, Circular Economy

JEL Classifications: L81, M31, Q01, D12, and L15

1. INTRODUCTION

The need for sustainable consumption has grown rapidly around the globe, particularly in urban environment where natural systems are being strained by fast expansion and changing consumer tastes. With this recent development, environmental sustainability is currently well recognized as a separate and quantifiable component of customer satisfaction models.

Service quality plays an important role in sustainable consumption due to the influence on environmentally conscious behaviour and customer satisfaction. The service quality is frequently evaluated through the SERVQUAL framework which focuses

on five key dimensions. The dimensions include tangibles, assurance, responsiveness, reliability, and empathy (Parasuraman et al., 1991). Although the model has been widely validated across industries, the study focusses on customer satisfaction in conventional service contexts only. Hence to accommodate the fast expansion and changing consumer tastes, the SERVQUAL framework should be extended to capture eco-conscious behaviors.

This framework expansion is supported by prior studies. For example, Menezes et al. (2020) introduce SERVQUAL revision that includes environmental sustainability as a stand-alone variable. The study concluded that practices such as waste reduction, energy conservation, and ethical sourcing can be systematically assessed

in addition to conventional service criteria. This component offers a better understanding of how green initiatives impact perceived value, trust, and customer loyalty. Islam and Khan (2024) highlight that customers' personal values and environmental awareness significantly influence their choices for sustainable purchases, further supporting this integration. The findings from Selvanathan et al. (2025) add further relevance to this integrated approach as the role of sustainability is enhanced due to the rising household income and consumer activity.

The extension of SERVQUAL framework is derived from Ajzen's (1991) theory of planned behaviour (TPB). TPB is essential for decisions driven by sustainability since it clarifies how attitudes, subjective norms, and perceived behavioral control affect consumption choices (Paul et al., 2016). TPB links pre-consumption values to behavioral outcomes, in contrast to expectancy-disconfirmation theory (EDT), which focuses on post-purchase satisfaction (Oliver, 1980). It also offers more perspectives than value-belief-norm theory (VBN), which prioritized morality but disregards service experience (Stern, 2000; Han and Hyun, 2017). Hence, TPB is the best approach to effectively analyze service quality and eco-conscious practices in the research field (Rozenkowska, 2023).

This approach also contributes to the broader themes, supporting international initiatives such as Sustainable Development Goals 11 which concentrate on sustainable urban development. Through customer engagement and sustainable operations, these relationships illustrate how strategically oriented service organizations can help national sustainability goals (Sharma et al., 2025). The study utilizes structural equation modelling (SEM) to evaluate six hypotheses to ascertain the impact of each independent variable on customer satisfaction. The findings should provide beneficial advice to organizations aiming to combine environmental stewardship with operational success, which in return will improve long-term customer loyalty and brand perception.

Thus, following are the theoretical contribution of this study:

- a. Integration of sustainability as sixth variable under SERVQUAL framework
- b. Incorporating sustainability and behavioral theories with service quality literatures
- c. Offering empirical evidence from Malaysia, a growing market where consumer expectation is shifting due to global sustainability.

The following are the research questions developed for this study:

- RQ1: Do tangible service elements influence customer satisfaction in Malaysia's urban F&B and retail sector?
- RQ2: Does service reliability contribute to customer satisfaction among urban consumers in Malaysia?
- RQ3: How does service responsiveness affect customer satisfaction in Malaysia's F&B and retail sectors?
- RQ4: Does the presence of assurance and professionalism influence customer satisfaction in retail and F&B service encounters?
- RQ5: To what extent does empathetic interaction shape customer satisfaction in Malaysia's urban consumer market?

RQ6: Does environmental sustainability positively influence customer satisfaction among eco-conscious consumers in Malaysia?

2. LITERATURE REVIEW

The SERVQUAL framework has been widely used to measure service quality across diverse industries in Asean region. However, the studies only emphasize traditional dimensions and lack further evaluation of environmental practices on the framework. This exclusion is significant, given the growing importance on sustainable consumption in Malaysia's urban F&B and retail sectors. The lack of integration draws attention to a crucial gap in prior studies, where it fails to identify the impact of sustainability initiatives influencing customer satisfaction. Besides, there is also lack of studies which incorporate SERVQUAL framework with broader theories. The theory of planned behavior (TPB) referring to how attitudes, subjective norms, and perceived behavioral control shape sustainable consumption. Despite this, the theory has not been integrated with SERVQUAL dimensions to identify eco-conscious service expectations.

Despite the sheer volume of studies focusing on sustainability and service quality, geography is often centered around western countries. These nations have deeply ingrained environmental concerns in their consumption behaviour. In contrast Asian countries presents a more fragmented picture where findings frequently contradict one another. For instance, the study from Villanueva et al. (2023) which focused on fast food restaurants in Philippines during pandemic argued assurance as the key indicator for consumer satisfaction. On the contrary, the study on Starbucks in Malaysia by Cheng et al. (2024) emphasize reliability as the primary factor in influencing consumer satisfaction. Furthermore, according to Mohamed and Ali (2019) Malaysian customers are becoming more receptive to environmental cues in retail and culinary services. However, Zebua and Sijabat (2025) argue that conventional considerations such as convenience and price sensitivity continue to influence consumer choices, with little attention paid to environmental consciousness. In comparison, there are also studies which conclude two variables incorporating to deliver the best results in improving consumer satisfaction. For example, Divya and Reddy (2025), concluded that responsiveness and dependability variables have the significant impact in determining a customer's loyalty.

These observations suggest that the perception of people towards quality of service can be influenced by external factors such as norms and environmental conditions. The contradiction also highlights the evolving nature of Malaysian consumers perspective as they attempt to balance traditional purchasing habits and their new eco-conscious values. Moreover, as customer expectations shift towards environmental consciousness, sustainability becomes an important evaluation criterion. This is in line with the study from Khalufi et al. (2025), who points out the significance of retail businesses' commitment to environmental responsibility, which enhances consumer satisfaction and brand credibility.

In summary, the discussion serves as a foundation for adding sustainability as a stand-alone variable to the SERVQUAL

framework. It is both theoretically and practically important to gain insight into how sustainability can be incorporated in Malaysian service quality standards. This study will address the identified gap by integrating the SERVQUAL framework with sustainability and TPB to provide a holistic understanding of consumer expectations in Malaysia. Retail and F&B businesses with sustainable practices can better respond to the values of contemporary Malaysian consumers and fit with global environmental goals, especially those delineated in SDGs 11 and 12.

2.1. Tangible Service Elements

In Malaysia's urban F&B and retail context, tangible service components, including interior design, cleanliness, and technology integration, influence consumer opinions. Youssef et al. (2025) argued that servicescape aesthetics and symbolic cues in smart kiosks directly influence customer inspiration and satisfaction. The physical cues serve as the trust signals in busy urban environment resulting in brand identity and perceived value improvement. These components are especially important in cutthroat marketplaces where word-of-mouth recommendations and repeat business are fueled by first impressions.

2.2. Service Reliability

Service reliability, which includes consistent service delivery and dependability, remains essential for customer satisfaction in urban service sectors. This perspective is complemented by study conducted in the Indonesian F&B industry by Setiono and Hidayat (2022) which found reliability as the best predictor of customer satisfaction, outperforming other factors like responsiveness and empathy. Similarly, the importance of reliability was further reinforced through the study by Musasa and Tlapana (2023), who concluded reliability as the important factor which influence shopping frequency and satisfaction among South African retail consumers. Thus, these findings suggest that in the highly competitive retail and F&B markets, reliability helps to reduce perceived risk and build customer trust towards the organization.

2.3. Service Reliability

In Malaysia's F&B industry, promptness and attentiveness of service delivery are essential variables of customer satisfaction. Study by Rahman et al. (2023) lend support to this theory, by concluding responsiveness as an essential operation metrics since consumer satisfaction mediates the relationship between pricing fairness and intentions to return. Likewise, attentiveness of service aid functional expectations and convey professionalism. In return, customer loyalty and emotional involvement are improved. Hence, responsiveness becomes a strategic tool for customer retention and distinction as competition heats up.

2.4. Assurance and Professionalism

Assurance is one of the key dimensions which positively enhance customer satisfaction in F&B sector based on the study conducted at Starbucks in Johor Bahru (Chai, 2021). Staff professionalism and courtesy are some of the factors under guarantee which impact customer satisfaction. Besides reducing customer complaints, professionalism also improves brand reliability particularly in premium service encounters. As a result, in highly competitive

urban marketplaces, assurance plays a critical role in maintaining long-lasting customer relationships.

2.5. Empathetic Interaction

Empathy in service interactions which is exemplified by active listening, personalized attention, and emotional sensitivity, improves customer satisfaction. The study by Huang's (2017) in Klang Valley coffee shops suggests that empathy fosters emotional resonance and sense of community among consumers. In densely populated urban areas where consumers value both efficiency and connection, empathetic service adds a human touch to the experience and deepens brand affinity.

2.6. Environmental Sustainability

The impact of environmental sustainability on customer satisfaction is growing, as the Malaysian urban consumers progressively developing environmental conscious. According to research by Gunardi and Harjadi (2022), consumers who believe they can positively impact the environment are more likely to be satisfied and have a willingness to make purchases. Organizations that employ sustainable practices, such as reducing waste and sourcing products ethically, will be in a better position to attract and retain such consumers as awareness grows. These programs improve brand perception and encourage loyalty in addition to being in line with consumer values.

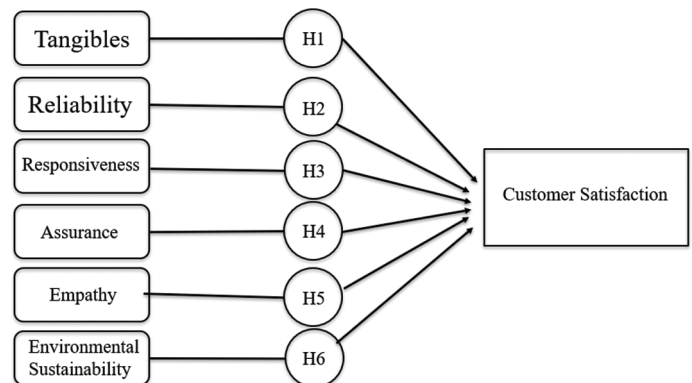
Drawing upon insights from previous research, the study formulated the following hypotheses as illustrated in Figure 1:

- H₁: Tangible service elements have a positive and significant influence on customer satisfaction
- H₂: Reliability has a positive and significant influence on customer satisfaction
- H₃: Service responsiveness has a positive and significant influence on customer satisfaction
- H₄: Assurance and professionalism have a positive and significant influence on customer satisfaction
- H₅: empathetic interaction has a positive and significant influence on customer satisfaction
- H₆: Environmental sustainability has a positive and significant influence on customer satisfaction.

3. METHODOLOGY

The study adopts a quantitative research design, drawing upon established theories from prior studies such as Parasuraman

Figure 1: Research framework



et al. (1991) and Menezes et al. (2020) in service quality and environmental sustainability to guide its framework. A Likert scale-based questionnaire was developed to evaluate customer perceptions of six variables: Sustainability, tangibles, assurance, responsiveness, reliability, and empathy. Sustainability is added as the 6th variable within the SERVQUAL framework to reflect eco-conscious service expectations. Likert scale was used because it offers a defined measurement scale to assess respondents' perception towards a statement. For ease of understanding survey items are constructed using straight forward, layperson simple terms. Due to its proven effectiveness in service quality research and its resilience in analysing intricate interactions between underlying components, structural equation modelling (SEM) was used for the study's analysis. The analysis was conducted in Jamovi cloud software (Jamovi Project, 2025). Standard indices such as the Tucker-Lewis index (TLI), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Chi-square to degrees of freedom ratio (CMIN/d) were used to assess model fit, and benchmarks were set to recognized cut-off values.

In order to mitigate bias in response, a few measures have been taken for survey item development. First, study items were placed in a random order, mixing the SERVQUAL dimensions, to avoid pattern bias. Pattern bias often leads to respondents' answers to follow a rhythm. For example, questions such as "how likely are you" questions in a row may lead the respondents to pick the same answer option "likely" for all items, due to survey fatigue. In addition, Google Forms feature "shuffle question order" option for sections or blocks is enabled. This avoids automatic or inattentive responding from respondents, where each question shall be engaged attentively, as well as enhances the quality of data collected for the study. A pilot test was conducted based on guidelines from Morse (2000), with 30 respondents to ensure clarity and reliability of the survey items. The survey questionnaire was revised based on the feedback from the pilot test. Following the revision, 3 weeks of research data collection were conducted in accordance with recommendation from Saunders et al. (2019).

All the survey participants including the pilot test were informed of the purpose of the study and their right to withdraw from the study anytime without any penalty. Participation was entirely voluntary. Informed consent was obtained electronically through the survey instrument (Google Forms), which included a mandatory consent section prior to the submission of the questionnaire. No personal information of the participants was collected, and all responses were treated with strict confidentiality. Data were stored securely in a locked Google drive accessible only to the researchers. Data was used solely for academic purposes and reported in aggregate form to ensure anonymity.

The survey was distributed online to Malaysian consumers aged 18-60, selected through purposive sampling. Purposive sampling is justified because it allows for targeted data gathering from urban consumers who have recent experience with retail or F&B services and are consistent with the theory of planned behavior (TPB). This is also supported by earlier research, such as Etikan et al. (2016), which emphasize how purposeful sampling enables targeted data

collection. Furthermore, using the principles of Hair et al. (2011), the sample size was designed to meet the need of 10-20 cases per estimated parameter. This sample size helps model stability and enhances the generalizability of the results. Sociodemographic data, such as age, gender, and visitation frequency, were also collected as control variables (Table 1). Multicollinearity was also measured using variance inflation factors (VIF) (Table 2); all results were below the 3.3 threshold, suggesting that collinearity was not a significant problem (Kock and Lynn, 2012).

4. FINDINGS

4.1. Descriptive Statistics

Two hundred response were collected from consumers from four states in Malaysia, consist of Penang, Johor Bahru, Kuala Lumpur and Selangor. The sample varied in terms of age, gender, income, and frequency of visits to F&B and retail outlets. The majority of the respondents were between 26 and 35 years old (46.6%), followed by those aged 36-45 (28.4%). Further analysis of the relationship between age group and satisfaction scores revealed that people between age of 26-35 years old are most satisfied followed by 36-45 years old. This outcome highlights the difference in satisfaction among age category and emphasizes the difference in expectations between various age groups (Table 3).

Table 1: Demographic representation of the respondents

Demographic variable	Category	Frequency (n)	Percentage
Age group	18-25	112	22.4
	26-35	213	42.6
	36-45	142	28.4
	46-60	33	6.6
Gender	Male	228	45.6
	Female	261	52.2
	Prefer not to say	11	2.2
Monthly household income (MYR)	<2,000	84	16.8
	2,001-4,000	142	28.4
	4,001-6,000	184	36.8
	>6,000	90	18.0
Visit frequency to F&B/retail	Daily	103	20.6
	Weekly	242	48.4
	Monthly	122	24.4
	Occasionally	33	6.6

Table 2: Variance inflation factor (VIF) results

Construct	VIF	Threshold	Collinearity concern
Tangibles	2.63	<3.3	No
Reliability	3.03	<3.3	No
Responsiveness	2.78	<3.3	No
Assurance	2.88	<3.3	No
Empathy	2.50	<3.3	No
Sustainability	2.48	<3.3	No

Table 3: Age group and customer satisfaction levels

Age group	Satisfaction level (%)
18-25	22.11
26-35	34.65
36-45	27.75
46-60	16.06

The gender distribution among responders was balance with the majority of the responders were female with 52.2% and the rest being male and opting not to disclose. The evaluation of the results suggests that gender has an effect on satisfaction. Compared to male respondents, female respondents expressed a higher degree of satisfaction (49.7%). These results imply that, in comparison to women, men typically show lower levels of satisfaction with sustainability practices and service quality.

Similar conclusions can be drawn from the respondents' income profiles, with the largest contributors falling into two household income categories: RM 4,001-RM 6,000 (36.8%) and RM 2,001-RM 4,000 (28.4%). The results show a distinct trend when analysing the connection between satisfaction and income level. People who earn more than RM 6,000 have the highest satisfaction levels, indicating that purchasing power can enhance perceptions of sustainability practices and service quality. Nonetheless, the RM 2,001-4,000 group's favorable replies show that income is not the only factor influencing satisfaction (Table 4).

The most common visit frequency was weekly with 48.4% with monthly being next (24.4%). The age group of 26-35 has the highest visit frequency followed by 36-45 (Table 5). The mean ratings (Figure 2) for the SERVQUAL dimensions and sustainability indicators varied from 3.22 to 3.60 on a 5-point Likert scale, indicating favorable evaluations of service quality and environmental behaviors. The ratings also indicated 3.53 score for customer satisfaction suggesting respondents experienced a favorable level of satisfaction.

4.2. Evaluation of the Measurement Model

Reliability test, on the other hand, is the consistency and stability of responses across the items measuring the same construct. As displayed in Table 6, internal consistency was evaluated using Cronbach's alpha, and all constructions exceeded the 0.70 threshold recommended by Hair et al. (2019). The coefficient of 0.70 or above can be considered adequate for basic research regarding internal consistencies (Ahmad et al., 2024). Convergent validity was verified by composite reliability (CR) values ranging from 0.89 to 0.96. The elements also have sufficient variance to converge adequately on their intended construct as proven by the average variance extracted (AVE) values exceeding 0.50 for every construct (Fornell and Larcker, 1981).

4.3. Discriminant Validity

The Fornell and Larcker criterion was used to evaluate discriminant validity to ensure the uniqueness of each construct within the measurement model. The square root of each construct's average variance extracted (AVE) was compared to its correlations with other constructs. The outcome is indicated in Table 7, whereby each construct was empirically different from the others, with AVE values regularly exceeding inter-construct correlations.

4.4. Confirmatory Factor Analysis (CFA)

The measurement model across a number of indices resulted in good fit. All standardized factor loadings were statistically

Table 4: Household income and customer satisfaction levels

Income level	Satisfaction level (%)
<2,000	16.48
2,001-4,000	29.86
4,001-6,000	21.41
>6,000	32.25

Table 5: Age group and frequency of visits to F&B/retail outlets

Age group	Frequency of visiting F&B or retail outlets (%)
18-25	22.50
26-35	32.50
36-45	28.00
46-60	17.00

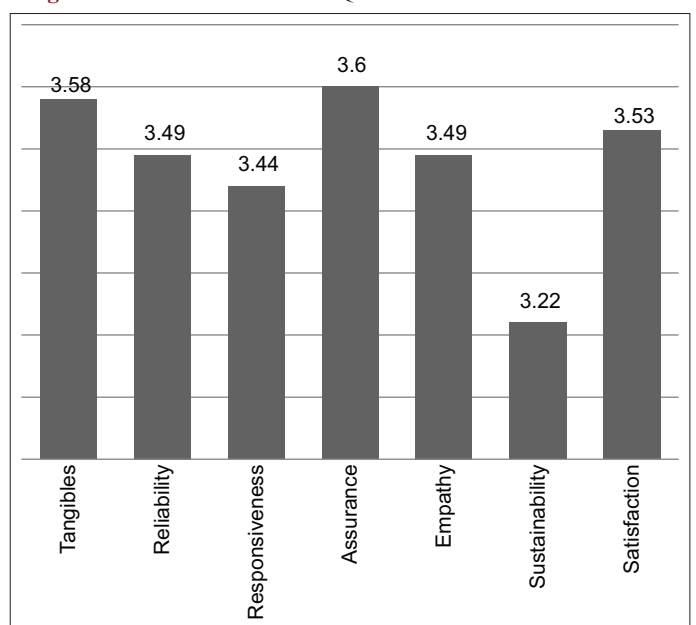
Table 6: Findings from measurement model analysis

Construct	Cronbach's alpha	CR	AVE
Tangibles	0.84	0.90	0.64
Reliability	0.84	0.90	0.64
Responsiveness	0.85	0.91	0.66
Assurance	0.82	0.89	0.62
Empathy	0.82	0.89	0.62
Sustainability	0.92	0.95	0.72
Customer satisfaction	0.94	0.96	0.76

Table 7: A comparison of AVE and Inter-construct correlations

Construct	\sqrt{AVE}	Highest correlation	Discriminant validity
Tangibles	0.80	0.515	Supported
Reliability	0.80	0.596	Supported
Responsiveness	0.81	0.680	Supported
Assurance	0.79	0.668	Supported
Empathy	0.79	0.668	Supported
Sustainability	0.85	0.722	Supported
Customer Satisfaction	0.87	0.685	Supported

Figure 2: Mean scores of SERVQUAL dimensions and satisfaction



significant ($P < 0.001$) and above 0.60, indicating that the latent constructs were resilient (Table 8).

4.5. Structural Equation Modelling (SEM)

The structural model accounted 62.4% of the variation in customer satisfaction ($R^2 = 0.624$), demonstrating important statistical significance. Path analysis was used to gain further insights into the connections between each independent variable and customer satisfaction. The results of the path analysis validate all six hypotheses that were formulated highlighting the importance of each one. As displayed in Table 9, the most significant predictor was sustainability practices, which had a path coefficient of 0.41 and a high level of statistical significance ($P < 0.001$). The next significant influence with a coefficient of 0.25 ($P < 0.01$) is assurance. While reliability came in next with a coefficient of 0.28 ($P < 0.01$), empathy, responsiveness, and tangibles all had least impact on satisfaction.

4.6. Mediation Analysis

Sustainable consumption behaviour was evaluated as a mediating variable between service quality dimensions and customer satisfaction. The findings as per Table 10, point out that sustainable practices partially moderate the connections between consumer satisfaction, assurance, reliability, and empathy. Specifically, the indirect effect of reliability through sustainability was significant ($\beta = 0.18$, 95% CI [0.068, 0.294]), indicating that while reliability directly affects satisfaction, a sizable portion of that effect is distributed through how consumers view sustainable practices. Additionally, assurance was established to have a significant indirect effect ($\beta = 0.168$, 95% CI [0.058, 0.278]), confirming the theory that operational process which integrate sustainability improve consumers trust in service providers. Empathy, although often regarded as a softer component of service quality, also showed a significant indirect influence ($\beta = 0.16$, 95% CI [0.052, 0.268]). Despite the mediation type is categorized as partial, the

indirect pathway's robustness suggests that empathic consumer involvement gains greater value when connected to ethical and environmental factors. Further supporting the integrative role of sustainability across many service interactions were the moderate indirect impacts of responsiveness ($\beta = 0.159$, 95% CI [0.053, 0.265]) and tangibles ($\beta = 0.16$, 95% CI [0.053, 0.267]). Notably, sustainability as a predictor of satisfaction also influenced its own pathway ($\beta = 0.155$, 95% CI [0.051, 0.259]), indicating an interconnected relationship between sustainable practices and consumer satisfactions.

4.7. Moderation Analysis

The control variable, gender was further evaluated as moderating factor using linear regression in Jamovi Cloud online software. The results of a path coefficient of 0.42 and high statistical significance ($P < 0.001$) prove that female consumers value sustainability activities more than male consumers. This is also consistent with the results presented in Table 11, which indicate that female consumers (49.72%) are more satisfied than male consumers. Despite these findings on sustainability value versus gender, evaluation of traditional service quality dimensions such as tangibles and reliability resulted in insufficient gender-related differences. This outcome is contrary with prior studies from Atulkar and Kesari (2017) and Marín-García et al. (2021). Atulkar and Kesari (2017) argued the preference of reliability and assurance variables by male consumers while Marín-García et al. (2021) highlighted that female consumer respond more positively to sustainability cues. This outcome emphasizes the significance of including gender dynamics into frameworks for understanding consumer behavior.

4.8. Comparative Analysis with Western SERVQUAL Studies

There is a significant distinction between the results and Western SERVQUAL studies. First, in Malaysia, mid-aged groups reported higher levels of satisfaction; yet, in Western studies such as Cheng et al. (2017), Nuyken et al. (2023) and Karatepe and Avci (2002), younger individuals tend to be more satisfied. These results point to the cultural and contextual variations in how different regions regard service quality. On the other hand, Western SERVQUAL studies generally yield lower reliability ratings for sustainability-related dimensions since sustainability is rarely incorporated into the model (Chodzaza

Table 8: Confirmatory factor analysis (CFA)

Fit index	Value	Threshold
CMIN/df	1.61	<3
CFI	0.97	>0.90
TLI	0.96	>0.90
RMSEA	0.06	<0.08
SRMR	0.04	<0.08

Table 9: Structural model path coefficients

Hypothesis	Path	β	t-value	P-value	Decision
H ₁	Tangibles→Satisfaction	0.21	2.85	<0.05	Supported
H ₂	Reliability→Satisfaction	0.28	3.92	<0.01	Supported
H ₃	Responsiveness→Satisfaction	0.19	2.14	<0.05	Supported
H ₄	Assurance→Satisfaction	0.25	3.27	<0.01	Supported
H ₅	Empathy→Satisfaction	0.22	2.33	<0.05	Supported
H ₆	Sustainability→Satisfaction	0.41	5.67	<0.001	Supported

Table 10: Mediation analysis

Indirect path	Indirect effect (β)	Ninety-five percent CI	Mediation type
Reliability → Sustainability → Satisfaction	0.18	(0.068, 0.294)	Partial
Assurance → Sustainability → Satisfaction	0.17	(0.058, 0.278)	Partial
Empathy → Sustainability → Satisfaction	0.16	(0.052, 0.268)	Partial

Table 11: Gender and customer satisfaction levels

Gender	Satisfaction level (%)
Female	49.72
Male	37.75
Prefer not to say	12.11

and Gombachika, 2013). The higher reliability observed in this study demonstrates the robustness of the hybrid SERVQUAL-sustainability framework in the Malaysian environment. Furthermore, the findings of this study align with certain Western SERVQUAL application, yet contradictory to others regarding which dimensions serve as the strongest predictors of satisfaction. For instance, Rauch et al. (2015) discovered that the best indicators of satisfaction were assurance and dependability. Chen (2015), however, emphasizes sustainability as the rising factor in consumer satisfaction in Western hotel settings, which is consistent with this study. Lastly, western SERVQUAL research continues to focus on traditional service quality measures while rarely examining sustainability as a mediator (Rauch et al., 2015). In conclusion, these differences emphasize the unique contribution of this study in demonstrating how sustainability, which is frequently disregarded in western SERVQUAL studies, emerges as a reliable and culturally relevant driver of satisfaction within the Malaysian context.

5. DISCUSSION

RQ1: Do tangible service elements influence customer satisfaction in Malaysia's urban F&B and retail sector?

H₁: Tangible service elements have a positive and significant influence on customer satisfaction.

Modern equipment and staff appearance are few examples of tangible service characteristic that have a moderate impact on customer satisfaction. Physical cues do not serve as the primary driver of satisfaction, but they do add to perceived service quality. This is also proven with the standardized path coefficient from tangibles to satisfaction, which was $\beta = 0.21$ ($P < 0.05$). The result implies that although Malaysian consumers appreciate hygienic and appealing environments, their level of satisfaction is more influenced by the functional aspects of service delivery. The SERVQUAL technique, which sees tangibles as essential but non-determinative criteria in calculating customer assessments, is in line with these findings. Rahim et al. (2020) further reinforce this by indicating that in Malaysia's F&B sector, while tangibles enhance the consumer experience, the variable operate in conjunction with other quality variables to affect overall satisfaction.

RQ2: Does service reliability influence customer satisfaction in Malaysia's urban F&B and retail sector?

H₂: Reliability has a positive and significant influence on customer satisfaction.

Service reliability proved to be the second strongest indicator of customer satisfaction with a path coefficient of $\beta = 0.28$ ($P < 0.01$). This element includes delivering services as promised and resolving concerns from consumers. The results suggest that

consumers prefer business which can fulfil their commitments and provide memorable experience as reliability serves as the foundation for building trust. These findings are in line with prior research by Ong et al. (2022), which found dependability significantly impact customer satisfaction in Malaysia's public service environment. Moreover, Cheng et al. (2024) also noted that operational reliability, is crucial in determining consumer loyalty and satisfaction in Malaysia's F&B sector, especially for high-performance brands like Starbucks.

RQ3: How does service responsiveness affect customer satisfaction in Malaysia's F&B and retail environments?

H₃: Service responsiveness has a positive and significant influence on customer satisfaction.

The standardized path coefficient of $\beta = 0.19$ ($P < 0.05$) suggests that service responsiveness has minimal impact on customer satisfaction. Despite the results, service responsiveness serves a unique value in providing positive customer service. In Malaysian F&B sector, customers anticipate attentive and timely service where responsiveness has a direct impact on their whole experience. The theory is supported by study from Villanueva et al. (2023) which used an enhanced SERVQUAL framework to investigate service quality in fast-food outlets during the COVID-19 pandemic. The researchers emphasized that responsiveness helps maintain customer trust by lowering service interruptions and meeting high standards for timeliness and attentiveness. This flexibility strengthened the responsiveness's strategic value in service delivery by positioning it as a stabilizing force in unpredictable circumstances.

RQ4: Does the presence of assurance and professionalism influence customer satisfaction in retail and F&B service encounters?

H₄: Assurance and professionalism have a positive and significant influence on customer satisfaction.

The hypothesis four is validated by the results ($\beta = 0.25$, $P < 0.01$), which demonstrate how assurance, namely staff confidence and professionalism have a beneficial impact on consumer satisfaction. The outcome emphasizes the value of professionalism, particularly in the retail and F&B industries. Assurance can be classified as the key tool for improving customer satisfaction because it increases consumer trust and strengthens brand credibility. The findings complement the research from Arshad and Ahmad (2022). The research utilized SERVQUAL methodology to evaluate the level of service provided to Gen-Y Malaysian customers at fast-food premises. The research underlined that Gen-Y customers place a high value on courteous and competent service since it builds trust and improves perceptions of services.

RQ5: To what extent does empathetic interaction shape customer satisfaction in Malaysia's urban consumer market?

H₅: Empathetic Interaction has a Positive and Significant Influence on Customer Satisfaction.

Empathy, which was displayed by thoughtful treatment, understanding of consumer's needs, and personalized attention,

was positively correlated to satisfaction ($\beta = 0.22, P < 0.05$). Empathy not only ranked above tangible elements but also plays an important role in humanizing the service experience. Moreover, the mediation study showed that the benefit of empathy is increased when combined with sustainability policies, indicating that customers prefer businesses that exhibit both environmental responsibility and emotional intelligence. Empathic communication strengthens perceived service authenticity and builds emotional connections in Malaysia's urban market, where customers are increasingly driven by values. Empirical research of hotel guests in Malaysia using the SERVQUAL framework by Ali et al. (2017) supports this outcome. Their research highlights that empathy is a significant element influencing customer satisfaction. The study stressed that, especially in competitive service environments, emotionally resonant and relationally attentive interactions help bridge expectation gaps and strengthen customer loyalty.

RQ6: Does environmental sustainability positively influence customer satisfaction among eco-conscious consumers in Malaysia?

H₆: Environmental sustainability has a positive and significant influence on customer satisfaction.

With a path coefficient of $\beta = 0.41 (P < 0.001)$, environmental sustainability was the best indicator of customer satisfaction. Particularly among younger and affluent consumers, energy-saving methods and eco-friendly packaging were all highly valued. The mediation analysis also confirmed that sustainable consumption behaviour partially mediates the relationship between service quality and satisfaction, indicating that consumers' environmental values enhance their overall service evaluations. Suki (2015), who examined at how environmental satisfaction affect Malaysians' use of green products, supports this conclusion. The study found that customer environmental satisfaction significantly predicts both loyalty and overall satisfaction, reinforcing the idea that eco-conscious consumers respond positively to businesses that demonstrate visible environmental responsibility. Suki's research further highlights that sustainability is not a peripheral concern but a central component of consumer loyalty and trust in the Malaysian market.

Overall, the findings support all six hypotheses and advocate for embedding sustainability into the SERVQUAL framework. This approach aligns with consumer expectations and contributes to broader sustainability goals, particularly SDG 11 (sustainable cities) and SDG 12 (responsible consumption).

6. CONCLUSION

This study concludes that in Malaysia's urban F&B and retail industries, customer satisfaction is influenced by both service quality and sustainability. The structural model ($R^2 = 0.624$) emphasized that ethical and environmental values have significant impact on satisfaction in addition to operational performance. Female consumers responded distinctly to sustainability initiatives, based on gender-based moderation, which reflects global trends in environmentally conscious behaviour and emphasize the necessity of value-driven service methods.

Structural equation modelling (SEM) revealed that all five traditional service quality dimensions, including tangibles, reliability, responsiveness, assurance, and empathy, have a distinctive effect on customer satisfaction. Assurance and reliability were the most important predictors among these, enhancing the significance of professional conduct and reliable service in building customer satisfaction and trust. These results are consistent with prior research that highlights the fundamental function of reliability in service contexts (Ong et al., 2022) and the significance of assurance in building customer trust (Perez-Moron et al., 2022). Despite only serving minor advantage on customer satisfaction, tangibles, responsiveness, and empathy play an important role in the overall framework. For instance, individualized care enhances empathy when coupled with sustainability. This supports the theory that relational quality enhances the emotional resonance of service experiences (Ali et al., 2017). Furthermore, environmental practices had the biggest effect on satisfaction ($\beta = 0.41, P < 0.001$), indicating that urban consumers are shifting towards environmental consciousness. Mediation analysis proved sustainability amplifies service quality effects, supporting findings by Suki (2015) on environmental satisfaction's role in driving loyalty.

This study strengthens the SERVQUAL framework by integrating sustainability as the sixth service quality dimension. The results suggest that sustainability is a major factor influencing Malaysian service quality. In line with the principles of TPB, the purposive sampling strategy highlights the significance of recent customer experiences in influencing satisfaction outcomes in the Malaysian urban environment. Furthermore, the outcome also highlights the shortcomings of VBN and EDT models, which fail to sufficiently account for the mediating role of sustainability in service interactions. Moreover, the findings underscore the importance of consumer behaviour studies in advancing Sustainable Development Goals 11 (Sustainable Cities and Communities) and 12 (Responsible Consumption and Production), while also reinforcing Malaysia's commitments towards these targets. The retail and F&B industries in Malaysia would be able to learn practical insights through the findings of the study. Businesses that integrate operational excellence with visible sustainability practices are better positioned to enhance satisfaction and long-term retention of consumers.

Nevertheless, it is important to recognize a number of limitations for this study. The study's geographic concentration on urban consumers in four states in Malaysia may have limited its applicability to other areas with varying degrees of environmental consciousness. Second, by using a cross-sectional survey design, customer impressions are recorded at a specific moment in time, without taking changing attitudes or behaviors into consideration. Third, the use of self-reported data may add common method bias, such as acquiescence bias where the respondents regardless of their view agree with the statements. However, SEM methodology provides strong insights into latent components.

Future research should address the limitation of this study by deploying mixed-method techniques and longitudinal designs. The rationale behind the suggestions is to ensure the researchers

gain a deeper understanding of behavioral changes and nuances in experiences. Due to potential difference in service expectations and sustainability awareness, the scope of future study should be broadened to include residents in all environments. A longitudinal survey can be used to record changes in consumer mood over time, especially in response to changing market dynamics. The tool will provide deeper insights into consumer perceptions towards sustainability, resolving the shortcomings of cross-sectional survey analysis. The survey can be paired with qualitative interviews to gain in depth understanding of the challenges driving sustainable consumption. Moreover, the framework could be further enhanced by investigating moderating factors such as environmental knowledge and social norms. In conclusion, the strategic importance of integrating sustainability and service quality is reaffirmed in this study, offering a foundation for understanding Malaysian urban consumer behaviour and guiding future endeavors toward ethical, customer-focused service delivery.

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