DRIVING LOYALTY THROUGH SERVICE-QUALITY: DO AGE AND INCOME MATTER? EVIDENCE FROM MALAYSIA'S AUTOMOTIVE INDUSTRY

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Abstract. Customer loyalty is essential for sustaining competitive advantage in the automotive service industry, where repeated post-sales interactions strongly influence long-term customer relationships. This study examines the relationship between service quality and customer loyalty in Malaysia's automotive service industry and investigates whether age and income moderate this relationship. A quantitative cross-sectional survey was conducted using data collected from 385 customers of authorised automotive service centres in Malaysia. The data were analysed using multiple regression analysis. The findings reveal that service quality has a significant positive effect on customer loyalty, confirming that customers who perceive higher levels of service quality are more likely to remain loyal to their service providers. Although age exhibited a significant direct relationship with customer loyalty, neither age nor income significantly moderated the relationship between service quality and customer loyalty. These findings suggest that the influence of service quality on customer loyalty remains consistent across different demographic groups. This study contributes to the service marketing literature by providing evidence from an emerging market and offering practical implications for automotive service providers, highlighting the importance of consistently delivering high-quality services to strengthen customer loyalty rather than relying on demographic-based service differentiation.
Keywords: *service quality, customer loyalty, automotive service industry, demographic factors, Malaysia*

Introduction

In increasingly competitive service industries, customer loyalty has become a strategic priority, particularly in standardized and high-involvement post-sales service contexts. In automotive services, loyalty is shaped less by frequent product repurchase and more by repeated after-sales encounters at authorized service centres, where customers continuously evaluate service performance over time. In this context, service quality extends beyond operational performance by strengthening customer trust, encouraging repeat service visits, and stimulates positive word-of-mouth. Service quality has long been recognized as a key driver of customer satisfaction and loyalty across industries (Leong et al., 2024; Zhang et al., 2022). Contemporary service quality frameworks emphasize dimensions such as reliability, responsiveness, assurance, empathy, and tangibility in shaping customer experiences (Alghamdi and Bach, 2023; Mehmood and Shafique, 2023). Within automotive services where customers maintain long-term interactions with service providers perceived service quality can reinforce loyalty through consistent technical performance, effective communication, and respectful customer treatment (Fathulloh and Purnama, 2024; Bahari Mohamed et al., 2022).

Despite the strong empirical link between service quality and customer loyalty, an important question remains underexplored: do demographic differences meaningfully shape this relationship? Many service management and marketing studies implicitly assume that customers of different ages and income levels respond differently to service

quality, encouraging firms to segment service strategies accordingly. However, evidence on whether age and income actually moderate the service quality - loyalty relationship remains mixed, particularly in emerging markets where national brands serve broad consumer segments. Therefore, this study investigates the relationship between service quality and customer loyalty in Malaysia's automotive industry and specifically tests whether age and income moderate this relationship. By examining these boundary conditions, the study contributes to service quality and loyalty literature by clarifying whether demographic-based segmentation is theoretically and practically justified in Malaysia's automotive service context. The findings offer implications for managers seeking to strengthen loyalty through service improvements while making informed decisions about whether service differentiation by age and income is necessary. Beyond the automotive setting, this study offers implications for managers in standardized service industries where demographic segmentation is commonly practiced, yet its value as a basis for tailoring service strategies is often assumed rather than empirically established.

Research gap

Extant literature consistently demonstrates that service quality is a significant predictor of customer loyalty across service industries, including the automotive sector. Prior studies have examined this relationship primarily through direct effects models and mediating mechanisms such as customer satisfaction and brand image. While these approaches have enhanced understanding of how service quality influences loyalty, less attention has been paid to the moderating roles of demographic variables in shaping this relationship. In particular, demographic variables such as age and income are frequently employed as segmentation criteria in service management and marketing research. Many studies implicitly assume that customers from different age groups or income levels evaluate service quality differently and, consequently, exhibit different loyalty responses. However, empirical evidence on the moderating role of these demographic factors remains mixed, fragmented, and highly context-dependent, especially in emerging market settings. Moreover, much of the existing research on demographic moderation has been conducted in developed economies or in service contexts characterized by short-term or transactional interactions. Limited empirical evidence is available on whether age and income meaningfully moderate the relationship between service quality and customer loyalty in standardized, high-involvement post-sales service settings, such as Malaysia's automotive service industry. Addressing this gap is important for determining whether age and income provide additional explanatory value beyond the direct effect of service quality in explaining customer loyalty within Malaysia's automotive service industry.

Problem statement

Despite widespread managerial emphasis on demographic segmentation, it remains unclear whether age and income significantly alter the impact of service quality on customer loyalty in Malaysia's automotive industry. National car brands often invest resources in tailoring service strategies for specific demographic segments without clear empirical justification. The absence of conclusive evidence on the moderating role of age and income creates uncertainty for both theory development and managerial decision-making. Without a clearer understanding of whether demographic factors

strengthen or weaken the service quality - loyalty relationship, automotive service providers may overestimate the importance of demographic differentiation while underestimating the universal value of consistent service excellence. Addressing this problem is particularly relevant in Malaysia, where national automotive brands operate in a competitive environment and serve customers with diverse socioeconomic backgrounds.

Contributions of the study

This study makes three key contributions to the service quality and customer loyalty literature. First, it extends existing research by empirically examining the moderating roles of age and income in the relationship between service quality and customer loyalty, thereby responding to calls for greater theoretical precision in demographic segmentation research. Second, by focusing on a standardized and high-involvement post-sales service context in an emerging market, the study provides evidence on whether widely used demographic variables meaningfully alter loyalty formation mechanisms beyond Western and transactional service settings. Third, the findings offer managerial insight by clarifying whether demographic-based service differentiation is theoretically justified or whether consistent service quality remains the dominant driver of customer loyalty across customer segments.

Literature review

Customer loyalty in post-sales automotive services

Customer loyalty in the automotive sector is shaped by long-term relationships and repeated service encounters rather than frequent product purchases (Fathulloh and Purnama, 2024; Bahari Mohamed et al., 2022). Unlike fast-moving consumer goods, automotive loyalty is often expressed through continued reliance on authorized service centres, repeat maintenance visits, willingness to recommend the service provider, and preference for the same brand in future purchase decisions (Fathulloh and Purnama, 2024). In post-sales contexts, loyalty is closely tied to customers' experiences during service interactions, where reliability, responsiveness, and assurance influence trust and relationship continuity (Lim and Hassan, 2023; Bahari Mohamed et al., 2022; Van Tonder et al., 2020).

Service Quality as a driver of customer loyalty

Service quality remains one of the most established predictors of customer loyalty in service research (Leong et al., 2024; Zhang et al., 2022; Akroush et al., 2021). In the automotive service environment, customers evaluate service quality through both functional outcomes (e.g., accuracy of repairs, timeliness, and availability of parts) and the service process (e.g., staff courtesy, communication clarity, and willingness to assist) (Mehmood and Shafique, 2023). High perceived service quality reduces perceived risk, strengthens confidence in the service provider, and encourages repeat patronage and positive word-of-mouth (Alghamdi and Bach, 2023; Cheng et al., 2022; Akroush et al., 2021; Rather and Hollebeek, 2021). Recent empirical studies continue to demonstrate that service quality is positively associated with loyalty outcomes across service industries, including automotive maintenance and repair services (Amro et al., 2025; Chi and Phan, 2025; Alghamdi and Bach, 2023; Lim and Hassan, 2023). In

emerging markets, service quality is particularly salient because customer loyalty is challenged by increased competitive options, exposure to global service standards, and the availability of alternative non-authorized service providers (Tang et al., 2023; Bahari Mohamed et al., 2022).

Demographic factors as moderating variables

While the service quality - loyalty relationship is widely supported, recent literature increasingly emphasizes the importance of examining boundary conditions that may influence this relationship (Leong et al., 2024; Zhang et al., 2022). Contemporary service research cautions against assuming that demographic segmentation variables automatically shape customer responses, especially in standardized service settings (Tang et al., 2023; Zhang et al., 2022). Age and income are frequently employed as segmentation proxies because they reflect life stage differences and purchasing power. However, recent empirical findings suggest that their moderating effects are often context-dependent and inconsistent across industries (Leong et al., 2024; Alghamdi and Bach, 2023; Paul et al., 2022). Recent evidence also indicates that customer trust may serve as a more influential moderator than demographic characteristics in explaining loyalty outcomes within automobile service settings (Yılmaz and Sürmelioğlu, 2025). In emerging markets, where service systems are designed to serve heterogeneous customer groups under similar service standards, demographic variables may play a limited role in altering loyalty formation mechanisms (Lim and Hassan, 2023; Bahari Mohamed et al., 2022; Suhartanto et al., 2021). These mixed findings underscore the need to empirically examine whether age and income moderate the relationship between service quality and customer loyalty (Tang et al., 2023).

Age and the service quality-customer loyalty relationship

Recent studies suggest that age-related differences in service expectations may exist, particularly in terms of technology adoption, communication preferences, and perceived service convenience. Younger customers tend to prioritize efficiency, digital integration, and responsiveness, whereas older customers often value interpersonal reassurance, trust, and service reliability (Mehmood and Shafique, 2023; Lim and Ikram, 2022). These differences imply that age could influence how service quality perceptions translate into loyalty outcomes. However, evidence from standardized and high-involvement service environments indicates that age-based differences may diminish when service delivery processes and performance standards are consistent (Alghamdi and Bach, 2023). Recent automotive and service management studies further report non-significant or weak moderation effects of age, suggesting that service quality may exert a relatively uniform influence on loyalty across age groups (Fathulloh and Purnama, 2024; Zhang et al., 2022). This supports the argument that age should be empirically tested rather than assumed to be a differentiating factor in loyalty formation.

Income and the service quality-customer loyalty relationship

Income has traditionally been associated with variations in service expectations, perceived value thresholds, and tolerance toward service failures (Paul et al., 2022). Higher-income customers are often assumed to demand premium service experiences and personalized attention, whereas lower-income customers may emphasize fairness, affordability, and functional service outcomes (Tang et al., 2023; Zhang et al., 2022).

Recent service literature, however, challenges the strength of this assumption in regulated and standardized service contexts (Tang et al., 2023; Bahari Mohamed et al., 2022). Empirical studies conducted in emerging markets and service-intensive industries indicate that income does not consistently moderate the service quality - loyalty relationship, particularly when pricing structures, service procedures, and access to facilities are standardized (Tang et al., 2023; Bahari Mohamed et al., 2022). Recent findings further suggest that service quality may operate as a universal driver of loyalty, regardless of income differences, calling into question the managerial emphasis on income-based service differentiation (Leong et al., 2024; Zhang et al., 2022).

Theoretical framework and hypotheses development

Service quality and customer loyalty

Service quality has been widely recognized as a critical determinant of customer loyalty in service-based industries. In high-involvement services such as the automotive sector, customer loyalty develops through repeated post-sales interactions, including maintenance, repairs, and customer support. These interactions provide customers with continuous evaluations of service performance, which shape trust, satisfaction, and long-term commitment to a service provider. Expectation-Confirmation Theory (ECT) posits that customer loyalty is strengthened when perceived service performance meets or exceeds prior expectations (Zhang et al., 2022). Similarly, Social Exchange Theory (SET) suggests that customers reciprocate positive service experiences with continued patronage and favourable behavioural intentions, such as repeat visits and positive word-of-mouth (Leong et al., 2024). In the context of automotive service centres, consistent technical performance and reliable customer service contribute to expectation confirmation and reciprocal loyalty behaviours. Empirical studies in the automotive and service management literature consistently demonstrate a positive relationship between service quality and customer loyalty (Zhang et al., 2022; Rather and Hollebeek, 2021). Customers who perceive higher levels of reliability, responsiveness, assurance, and empathy are more likely to remain loyal to a service provider. Based on these theoretical perspectives and prior empirical evidence, the following hypothesis is proposed:

H1: Service quality has a significant positive relationship with customer loyalty in Malaysia's automotive industry.

The moderating role of age

Age is frequently used as a segmentation variable in service marketing research, based on the assumption that customers at different life stages possess distinct expectations, preferences, and service evaluation criteria. Younger customers are often characterized as more technology-oriented and efficiency-driven, whereas older customers may place greater emphasis on interpersonal interaction and trust-building elements of service quality. From the perspective of ECT, age may influence the formation of expectations and the criteria used to evaluate service performance. Similarly, SET suggests that differences in social values and reciprocity norms across age groups could shape how customers respond to service quality. However, in standardized service environments such as authorized automotive service centres, core service processes and performance standards are largely uniform, potentially limiting

the influence of age on loyalty formation. While some studies report age-based differences in service evaluations, empirical evidence on age as a moderator of the service quality - loyalty relationship remains inconclusive. This ambiguity warrants empirical testing, particularly in emerging markets where national automotive brands serve diverse age groups under similar service conditions. Accordingly, the following hypothesis is proposed:

H2: Age moderates the relationship between service quality and customer loyalty.

The moderating role of income

Income is another commonly cited demographic factor in customer segmentation, often associated with variations in service expectations and perceived value. Higher-income customers are typically assumed to demand superior service quality and personalized experiences, whereas lower-income customers may place greater emphasis on affordability and functional service outcomes. Within ECT, income may shape customers' reference standards and expectations regarding service quality. SET further suggests that customers with different economic resources may differ in how they perceive reciprocity and value in service exchanges. Nevertheless, in the automotive service context, standardized pricing structures, regulated service procedures, and uniform service delivery may reduce the extent to which income differentiates customer loyalty responses. Existing studies provide mixed findings on the moderating role of income in the service quality–loyalty relationship, particularly in post-sales service settings. This inconsistency highlights the need to empirically examine whether income meaningfully alters the impact of service quality on customer loyalty in Malaysia's automotive industry. Thus, the following hypothesis is proposed:

H3: Income moderates the relationship between service quality and customer loyalty.

Conceptual framework

Based on the theoretical arguments above, this study proposes a conceptual framework in which service quality directly influences customer loyalty, with age and income examined as moderating variables. This framework enables an assessment of whether age and income moderate the relationship between service quality and customer loyalty in Malaysia's automotive service industry.

Materials and Methods

Research design

This study employed a quantitative, cross-sectional survey design to examine the relationship between service quality and customer loyalty and to investigate the moderating effects of age and income among customers of authorized automotive service centres in Malaysia. A quantitative approach was considered appropriate because the study sought to empirically test hypothesized relationships among measurable variables using statistical techniques. The cross-sectional design enabled the collection of respondents' perceptions of service quality and loyalty at a single point in time and is widely adopted in service marketing and customer loyalty research due to its efficiency in examining relationships among variables (Hair et al., 2022; Zhang et al.,

2022). The research framework comprised one independent variable (service quality), one dependent variable (customer loyalty), and two moderating variables (age and income).

Sample and data collection

The target population comprised customers who had utilized the services of authorized automotive service centres in Malaysia. Only customers with prior post-sales service experience were eligible to participate because they were considered capable of providing informed evaluations of service quality and customer loyalty based on their actual service experiences. Restricting participation to customers with direct service experience enhanced the relevance and credibility of the data collected. A non-probability convenience sampling technique was employed because a comprehensive sampling frame of customers visiting authorized automotive service centres was not available. This sampling approach is widely adopted in service marketing research when respondents are selected based on their accessibility and willingness to participate. Data were collected using a structured self-administered questionnaire that was personally distributed to customers at authorized automotive service centres. Before completing the questionnaire, respondents were informed of the purpose of the study and assured that their participation was voluntary and that all responses would remain anonymous and confidential. Data collection was completed after the returned questionnaires were screened for completeness and consistency, resulting in 385 usable responses for the final analysis. The adequacy of the sample size was evaluated based on established recommendations for multiple regression analysis. Hair et al. (2022) emphasized that an adequate sample size is essential to ensure sufficient statistical power and stable parameter estimates. In addition, Green (1991) suggested that the minimum sample size for testing individual predictors in multiple regression should satisfy the formula $N \geq 104 + m$, where m represents the number of predictors. With a final sample of 385 respondents, the present study exceeded these recommended thresholds, indicating that the sample size was sufficient to test the proposed hypotheses.

Measurement of variables and scale

Service quality, customer loyalty, age and income

Service quality was measured using a structured questionnaire based on the SERVQUAL framework developed by Parasuraman et al. (1988). The questionnaire assessed customers' perceptions of service quality across the five dimensions of reliability, responsiveness, assurance, empathy, and tangibility. These dimensions have been widely recognized as key indicators of service quality and have been extensively applied in service marketing and automotive service research. Customer loyalty was measured using a structured questionnaire that assessed respondents' intentions to continue using the same authorized automotive service centre, recommend the service provider to others, and maintain a long-term relationship with the service provider. These indicators are consistent with established conceptualizations of customer loyalty in the service marketing literature. Age and income were measured as demographic variables and examined as moderating variables in this study. Respondents reported their age and monthly income by selecting the appropriate categories provided in the questionnaire. All perceptual variables were measured using a five-point Likert scale

ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), with higher scores indicating more favorable perceptions of service quality and stronger customer loyalty.

Data analysis strategy

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS). Prior to hypothesis testing, the data were screened for completeness, missing values, and potential data entry errors to ensure the quality and accuracy of the dataset. Descriptive statistics, including means and standard deviations, were computed to summarize the characteristics of the study variables, while Pearson correlation analysis was conducted to examine the relationships among the variables. Multiple regression analysis was employed to test the proposed hypotheses. The direct effect of service quality on customer loyalty (H1) was first examined by entering service quality as the independent variable and customer loyalty as the dependent variable. Age and income were subsequently included in the regression model to examine their direct effects on customer loyalty. To test the moderating effects proposed in H2 and H3, interaction terms were created by multiplying service quality with age and income, respectively. Prior to creating the interaction terms, the predictor variables were mean-centered to minimize potential multicollinearity between the predictor and interaction variables (Aiken and West, 1991). The statistical significance of the interaction terms was examined to determine whether age and income moderated the relationship between service quality and customer loyalty. Finally, the findings from the moderation analyses were interpreted collectively to determine whether age and income functioned as demographic boundary conditions in the relationship between service quality and customer loyalty in Malaysia's automotive service industry.

Ethical considerations

Ethical principles were observed throughout the research process to protect the rights and privacy of the respondents. Participation in the study was entirely voluntary, and respondents were informed of the purpose of the research before completing the questionnaire. They were also assured that their responses would remain anonymous and confidential and would be used solely for academic research purposes. Respondents were informed that they could decline to participate or withdraw from the study at any stage without any consequences. To ensure confidentiality, no personally identifiable information was collected, and the findings are reported only in aggregate form.

Results and Discussion

This section presents the results of the statistical analyses conducted to examine the relationships among the study variables and to test the proposed hypotheses. The findings include descriptive statistics, correlation analysis, multiple regression analysis, and moderation analysis examining the effects of age and income on the relationship between service quality and customer loyalty.

Descriptive statistics and correlations

Table 1 presents the descriptive statistics and Pearson correlation coefficients for the study variables. The mean score for service quality was 4.21 (SD = 0.62), indicating that respondents generally perceived the quality of services provided by authorized

automotive service centres positively. Customer loyalty also recorded a relatively high mean score (M = 4.10, SD = 0.58), suggesting a favourable level of loyalty among the respondents. The correlation analysis revealed a strong positive relationship between service quality and customer loyalty (r = 0.70), indicating that customers who perceived higher levels of service quality were more likely to exhibit stronger loyalty toward the service provider. In contrast, age (r = 0.18) and income (r = 0.11) demonstrated relatively weak positive correlations with customer loyalty. The correlation between age and income was also relatively weak (r = 0.22), suggesting limited association between the two demographic variables. Overall, the correlation results provide preliminary support for the proposed relationship between service quality and customer loyalty while indicating that demographic variables exhibit comparatively weaker associations with customer loyalty.

Table 1. *Descriptive statistics and correlations.*

Variable	Mean	SD	1	2	3	4
Service quality	4.21	0.62	-	-	-	-
Customer loyalty	4.10	0.58	0.70	-	-	-
Age	2.34	0.89	-0.12	0.18	-	-
Income	3.01	0.77	-0.08	0.11	0.22	-

*Note: N = 385; Pearson correlation coefficients *p < .05, p < .01.*

Regression results

Table 2 presents the results of the multiple regression analysis examining the effects of service quality, age, and income on customer loyalty. As shown in the table, service quality had a strong and statistically significant positive effect on customer loyalty (B = 0.98, SE = 0.04, t = 22.41, p < .001). This finding indicates that higher levels of perceived service quality were associated with higher levels of customer loyalty, thereby supporting H1. The results also revealed that age had a statistically significant negative relationship with customer loyalty (B = -0.18, SE = 0.07, t = -2.72, p = .007). This suggests that customer loyalty differed across age groups, although the magnitude of the relationship was relatively small compared with the effect of service quality. In contrast, income did not have a statistically significant direct effect on customer loyalty (B = -0.11, SE = 0.06, t = -1.72, p = .086). Therefore, income was not considered a significant predictor of customer loyalty in the present study. Overall, the regression results demonstrate that service quality was the strongest predictor of customer loyalty among the variables examined, whereas age showed a modest direct effect and income did not significantly influence customer loyalty.

Table 2. *Multiple regression analysis predicting customer loyalty.*

Predictor	B	SE	t	p
Service quality → Customer loyalty	0.98	0.04	22.41	p < .001
Age → Customer loyalty	-0.18	0.07	-2.72	0.007
Income → Customer loyalty	-0.11	0.06	-1.72	0.086

Moderation analysis

Moderation analysis was conducted to examine whether age influenced the relationship between service quality and customer loyalty. As presented in *Table 3*, the interaction between service quality and age was not statistically significant (B = 0.09,

SE = 0.07, t = 1.34, p = .179). The interaction term explained a negligible increase in the variance of customer loyalty ($\Delta R^2 = 0.00$), indicating that age did not significantly moderate the relationship between service quality and customer loyalty. Therefore, H2 was not supported.

***Table 3**. Moderation analysis: Age.*

Predictor	B	SE	t	p	ΔR^2
Service quality × Age	0.09	0.07	1.34	0.179	0.00

This study examined the relationship between service quality and customer loyalty in Malaysia's automotive service industry while investigating the moderating roles of age and income. The findings confirm that service quality is a significant predictor of customer loyalty, whereas age and income do not significantly moderate this relationship. These results suggest that service quality exerts a consistently positive influence on customer loyalty regardless of customers' demographic characteristics. Consequently, the findings reinforce the importance of delivering consistently high-quality services to strengthen customer loyalty in standardized automotive service settings.

Service quality as a robust driver of customer loyalty

The findings of this study confirm that service quality is a significant and positive predictor of customer loyalty in Malaysia's automotive service industry. This result supports H1 and is consistent with previous studies demonstrating that customers who perceive higher levels of service quality are more likely to remain loyal to a service provider (Rahman and Saidin, 2025; Alghamdi and Bach, 2023; Zhang et al., 2022; Akroush et al., 2021). The results suggest that customers value reliable service delivery, technical competence, effective communication, and courteous interactions, all of which contribute to stronger loyalty intentions. In the automotive after-sales service context, customers develop loyalty through repeated service encounters rather than frequent product purchases. Each interaction provides an opportunity for customers to evaluate the quality of the service received, gradually strengthening trust and reinforcing long-term relationships with the service provider. The strong positive relationship observed in this study indicates that consistently delivering high-quality service remains fundamental to retaining customers and encouraging positive word-of-mouth. The findings also support the theoretical perspectives underpinning this study. From the perspective of Expectation-Confirmation Theory (ECT), customers are more likely to remain loyal when the quality of the service meets or exceeds their expectations. Likewise, Social Exchange Theory (SET) suggests that customers reciprocate positive service experiences by maintaining long-term relationships and continuing to patronize the service provider. The present findings therefore reinforce the importance of service quality as a key mechanism through which customer loyalty is developed and sustained. From a managerial perspective, the findings emphasize that service quality should remain a strategic priority for automotive service providers. Investments in employee competence, service reliability, responsiveness, and customer relationship management are likely to enhance customer loyalty regardless of customers' demographic characteristics. In an increasingly competitive automotive market, consistently delivering high-quality service represents an effective strategy for strengthening customer retention and sustaining long-term business performance.

Reconsidering the role of age as a moderator

Contrary to the proposed hypothesis, the findings indicate that age did not significantly moderate the relationship between service quality and customer loyalty. Although age demonstrated a significant direct relationship with customer loyalty, the interaction between service quality and age was not statistically significant. This finding suggests that the positive influence of service quality on customer loyalty remained relatively consistent across different age groups. This finding differs from studies suggesting that customers of different ages exhibit distinct service expectations and evaluation criteria, particularly regarding technology adoption, communication preferences, and service convenience (Mehmood and Shafique, 2023; Lim and Ikram, 2022). However, it is consistent with research indicating that demographic differences may become less influential in standardized service environments where customers receive similar service procedures and quality standards (Alghamdi and Bach, 2023; Zhang et al., 2022). In authorized automotive service centres, standardized operating procedures, technical requirements, and service protocols may reduce age-related differences in customers' evaluations of service quality. From a theoretical perspective, these findings suggest that the relationship between service quality and customer loyalty is sufficiently robust to remain stable across different age groups in the Malaysian automotive service context. Rather than altering the effect of service quality, age appears to influence customer loyalty independently. This distinction contributes to the service marketing literature by highlighting the importance of empirically testing demographic variables rather than assuming they function as moderators across all service settings. For practitioners, the findings imply that automotive service providers may not need to develop substantially different service quality strategies for customers of different age groups. Instead, maintaining consistently high standards of service quality is likely to be more effective in fostering customer loyalty across a broad customer base.

Income and the universality of service quality effects

Contrary to the proposed hypothesis, the findings indicate that income did not significantly moderate the relationship between service quality and customer loyalty. In addition, income did not demonstrate a significant direct effect on customer loyalty. These findings suggest that the positive influence of service quality on customer loyalty remained consistent regardless of customers' income levels. This finding contrasts with the common assumption that customers with different income levels possess different service expectations and value perceptions. Previous studies have suggested that higher-income customers tend to expect premium service experiences and personalized attention, whereas lower-income customers place greater emphasis on affordability and functional service outcomes (Tang et al., 2023; Paul et al., 2022). However, the present findings indicate that these differences did not significantly influence how customers translated their perceptions of service quality into loyalty within Malaysia's automotive service industry. One possible explanation is that authorized automotive service centres operate under standardized service procedures, pricing structures, and quality standards. Consequently, customers are likely to evaluate the service experience using similar criteria regardless of their income level. In such environments, reliable service delivery, competent technical performance, and professional customer interactions may be more

influential in shaping customer loyalty than socioeconomic differences. From a theoretical perspective, the findings suggest that income does not substantially alter the relationship between service quality and customer loyalty in the context of standardized automotive after-sales services. Rather than emphasizing demographic characteristics such as income, future studies may benefit from examining psychological and behavioural factors, including customer involvement, perceived value, trust, or service experience, which may provide greater explanatory power for customer loyalty. From a managerial perspective, the findings indicate that automotive service providers should prioritize consistently delivering high-quality services across all customer segments rather than differentiating service strategies solely on the basis of income. Maintaining high standards of service quality is likely to strengthen customer loyalty irrespective of customers' socioeconomic backgrounds.

Integrative interpretation of the findings

Taken together, the findings of this study demonstrate that service quality is the primary determinant of customer loyalty in Malaysia's automotive service industry. Although age exhibited a significant direct relationship with customer loyalty, neither age nor income significantly moderated the relationship between service quality and customer loyalty. These findings suggest that the positive influence of service quality on customer loyalty remained relatively stable across different demographic groups. The findings contribute to the service marketing literature by reinforcing the importance of service quality as a robust predictor of customer loyalty in standardized service environments. This finding is consistent with recent meta-analytic evidence showing that service quality remains one of the strongest and most consistent predictors of customer loyalty across diverse service contexts (Chi and Phan, 2025). While demographic characteristics such as age and income are frequently used as market segmentation variables, the present study suggests that they may not necessarily influence how customers translate perceptions of service quality into loyalty. This highlights the importance of empirically examining demographic variables rather than assuming they consistently function as moderators across different service contexts. The results also extend existing knowledge within the Malaysian automotive service industry by demonstrating that customers place greater emphasis on the quality of the service experience than on demographic differences. Reliable service delivery, competent technical performance, and professional customer interactions appear to be valued consistently by customers regardless of their age or income level. These findings support the view that maintaining consistently high service standards is more important than tailoring service quality strategies solely on the basis of demographic characteristics. Overall, this study underscores the central role of service quality in fostering customer loyalty and suggests that demographic variables should be interpreted cautiously when developing customer segmentation strategies. Future research should examine other contextual, psychological, and behavioural factors that may better explain variations in customer loyalty across different service settings.

Practical implications

The findings of this study provide several practical implications for managers and practitioners in Malaysia's automotive service industry. First, the strong positive relationship between service quality and customer loyalty highlights the importance of

consistently delivering high-quality post-sales services. Automotive service providers should prioritize continuous improvements in service reliability, technical competence, responsiveness, and customer communication, as these aspects contribute directly to customer loyalty. Second, the absence of significant moderating effects of age and income suggests that service quality initiatives should be implemented consistently across customer segments. Rather than allocating substantial resources to developing different service quality strategies based solely on demographic characteristics, managers may achieve greater benefits by maintaining standardized service excellence that meets the expectations of a broad customer base. Third, organizations should continue investing in employee training and development to strengthen both technical and interpersonal competencies. Service advisors and technicians play a critical role in shaping customers' service experiences through accurate repairs, timely service delivery, professional communication, and courteous interactions. Continuous training and performance monitoring can therefore contribute to stronger customer relationships and long-term loyalty. Finally, automotive service providers should establish effective customer feedback mechanisms to regularly monitor customers' perceptions of service quality and identify areas requiring improvement. By using customer feedback to support continuous service improvement, organizations can strengthen customer satisfaction, encourage repeat patronage, and sustain competitive advantage in an increasingly competitive automotive service market.

The discussion has demonstrated that service quality is the most important determinant of customer loyalty in Malaysia's automotive service industry. The findings confirmed that customers who perceived higher levels of service quality exhibited stronger loyalty toward authorized automotive service centres. Although age showed a significant direct relationship with customer loyalty, neither age nor income significantly moderated the relationship between service quality and customer loyalty. These findings indicate that the positive influence of service quality remained consistent across different demographic groups. Overall, the study highlights the importance of maintaining high standards of service quality as the foundation for building long-term customer loyalty. By integrating the empirical findings with existing theories and previous research, this study contributes to a better understanding of customer loyalty in the automotive service context and provides practical insights for organizations seeking to strengthen customer relationships through consistent service excellence.

Conclusion

This study examined the relationship between service quality and customer loyalty in Malaysia's automotive service industry while investigating the moderating roles of age and income. The findings demonstrate that service quality is a strong and significant predictor of customer loyalty, indicating that customers who perceive higher levels of service quality are more likely to remain loyal to authorized automotive service centres. Contrary to the proposed hypotheses, neither age nor income significantly moderated the relationship between service quality and customer loyalty. Although age exhibited a significant direct relationship with customer loyalty, the influence of service quality remained consistent across different demographic groups. These findings suggest that consistently delivering high-quality service is more influential in fostering customer loyalty than demographic differences among customers.Overall, this study reinforces the strategic importance of service quality in strengthening customer loyalty within

Malaysia's automotive service industry. By providing empirical evidence from an emerging market context, the study contributes to the growing body of knowledge on customer loyalty and offers practical insights for organizations seeking to enhance customer retention through service excellence.

This study contributes to the customer loyalty and service marketing literature in several ways. First, it confirms the central role of service quality as a robust predictor of customer loyalty within Malaysia's automotive service industry, extending existing evidence from an emerging market context. Second, the findings demonstrate that age and income did not significantly alter the relationship between service quality and customer loyalty, suggesting that demographic characteristics may not always function as meaningful moderators in standardized service environments. These findings encourage researchers to empirically examine demographic variables rather than assuming their moderating effects across different service settings. Finally, the study highlights the importance of considering contextual factors when examining customer loyalty. Future research should investigate additional psychological, behavioural, and organizational variables that may provide greater explanatory power in explaining variations in customer loyalty across service industries. Despite its contributions, this study has several limitations that should be acknowledged. First, the cross-sectional research design limits the ability to establish causal relationships among the study variables. Future research could employ longitudinal or experimental designs to examine how customers' perceptions of service quality and loyalty evolve over time. Second, this study focused exclusively on age and income as demographic variables. Future research should examine demographic, psychological, and behavioural factors that may better explain variations in customer loyalty. Examining these variables may provide a more comprehensive understanding of the factors influencing customer loyalty. Finally, the study was conducted among customers of authorized automotive service centres in Malaysia, which may limit the generalizability of the findings to other industries or geographical contexts. Future research could replicate this study in different service sectors or conduct cross-country comparative studies to determine whether the observed relationships remain consistent across diverse cultural and institutional settings.

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Conflict of interest

The authors confirm that there is no conflict of interest involve with any parties in this research study.

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