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Service Innovation and Quality's Impact on Customer Retention: Automotive Industry Amid Economic Turbulence

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Abstract

This study analyses the role of service innovation and quality in enhancing customer retention within Zimbabwe's automotive industry amidst economic turbulence. The primary objective is to evaluate how service innovation, quality, and customer experience impact customer retention. A cross-sectional survey design and Structural Equation Modelling (SEM) were used to assess interactions between variables, with data collected from 200 respondents. Findings indicated that service innovation positively impacts service quality and customer experience but has a marginal direct effect on retention. Quality perception is related to garage location, infrastructure, and equipment, indirectly affecting retention. Service innovation enhances delivery, but operational excellence, quality improvement, and customer orientation are crucial for retention. Investments in infrastructure, digital innovations, and employee training are recommended. These findings emphasise the need for integrating innovative technologies and robust practices to boost customer loyalty. Future research should examine economic conditions, technological advancements, and competitive dynamics as moderating factors.

Keywords: *Service Innovation, Customer Retention, Service Quality, Customer Experience, Turbulent Economy.*

I. INTRODUCTION

In today's globalised economy, intense competition requires that organisations adopt new approaches to service delivery and quality improvement to keep their customers. Service innovation has become a critical factor in shaping competitive advantage in the automotive industry, particularly in economies experiencing financial instability (Anderson & Thompson, 2022). In Zimbabwe, ongoing economic instability, marked by unstable exchange rates, inflationary pressures, and precarious fuel supplies, poses considerable challenges to companies (Garcia et al., 2023). The automobile sector, being a major driver of economic activity, is significantly impacted, such that the service providers must contend with evolving customer needs and volatile market environments. Customers are increasingly choosing low-cost, home-based service providers over traditional garages, and customer loyalty has therefore become a priority for traditional automotive service providers (Smith et al., 2023). It is against this backdrop that service innovation becomes a vehicle for improving service delivery, efficiency, and customer retention in a highly volatile economic environment.

Service innovation involves the creation of new technologies, new business models, and process enhancement in operational processes that change the way services are delivered (Rout, 2023). The automobile sector has embraced innovations like predictive maintenance, AI-driven diagnostics, and mobile service applications in the pursuit to attain customer satisfaction and service

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excellence (Müller et al., 2022). Despite the widespread research on innovation in mature markets, its application in circumstances where resources are limited is still under researched (Kim & Park, 2024). In Zimbabwe, the industries experience supply chain disruptions and aging infrastructure, rendering service innovation implementation a significant handicap as well as an imperative need. It thus becomes necessary to understand the impact of service innovation on local automobile industry and customer loyalty.

Service quality remains an important driver of customer loyalty, and dimensions of reliability, responsiveness, and empathy (Garcia et al., 2023). The most common model utilised in service measurement, the SERVice QUALity (SERVQUAL) model, highlights the contribution of these drivers towards customer perception (Hong et al., 2024; Zeithaml et al., 1988; Zygiaris et al., 2022). Amidst turbulent economic conditions, the quality standard would no longer suffice, hence the necessity for perpetual innovation merely to keep pace with evolving customer expectations (Anderson & Thompson, 2022). Customer experience, as dictated by integrated service experience, one-to-one interaction, and successful problem-solving, in turn, dictates loyalty (Kim & Park, 2024). Although the link between service quality and customer retention is proven, the relationship among economic uncertainty, service innovation, and loyalty needs further investigation (Smith et al., 2023). The aim of this study is to explore the role played by service innovation, service quality, and customer experience in customer retention within the automobile industry in Zimbabwe.

II. THEORETICAL FRAMEWORK AND HYPOTHESIS DEVELOPMENT

This research utilises the SERVQUAL model, Expectation-Confirmation Model (ECM), and Customer Relationship Management (CRM) to examine service innovation, service quality, and customer loyalty in the automobile sector.

- *SERVQUAL Model*

The SERVQUAL model, established in 1988 by Zeithaml, Parasuraman, and Berry, is one of the most used models to measure service quality in industries. The model works based on five dimensions: tangibility, reliability, responsiveness, assurance, and empathy (Wang et al., 2023; Liu & Chen, 2023; Garcia et al., 2022). It remains a handy measure to approximate customer satisfaction and the quality of services delivered. Research evidence demonstrates that digitalisation, such as AI-based diagnostics and self-service customer capabilities, enhances service quality perception (Kim et al., 2023; Zhao & Xu, 2023; Patel, 2022).

The automobile industry requires technological adoption to meet evolving customer needs. Studies affirm that companies that invest in automation of services and predictive analytics increase customer loyalty (Huang et al., 2023; Lin & Zhang, 2023; Cheng & Wang, 2023). SERVQUAL is employed in this study to examine the effect of innovation-driven service quality improvement on customer retention.

- *Expectation-Confirmation Model (ECM)*

Oliver (1980) industrialised ECM model and it assumes that performance should be equal to or greater than expectations to guarantee customer satisfaction and loyalty. ECM creates a link between customer expectations and future service experience, thus affecting satisfaction and retention levels (Brown & Smith, 2022; Zhang et al., 2023; Tan & Lee, 2023). It can be argued that the role of technology, as in real-time monitoring of vehicles and remote delivery of services (Huang et al., 2023; Singh et al., 2022; Zhao et al., 2023), is shaping expectations.

This study explores to what degree car service innovation addresses customers' needs and encourages loyalty. Literature supports that customers who gain from advance notice of services and ongoing correspondence are loyal (Kim et al., 2023; Patel & Singh, 2022; Liu et al., 2023).

- *Customer Relationship Management (CRM)*

Customer Relationship Management is a strategy utilised to develop and sustain long term customer relationships. CRM employs data-driven strategies for customer interaction and retention optimisation (Taherdoost, 2023; Patel & Singh, 2022; Zhao & Xu, 2023). Modern CRM leverages predictive analytics, personalised service recommendations, and automated feedback systems to improve customer loyalty (Cheng & Wang, 2023; Huang & Yu, 2023; Tan & Lee, 2023).

In the automotive sector in Zimbabwe, CRM plays a pivotal role in avoiding service inconsistency and enhancing customer satisfaction (Garcia et al., 2022; Lin & Zhang, 2023; Patel, 2022). The study considers how CRM-based personalisation, combined with service innovation, facilitates customer loyalty in the long run.

The integration of these models in this research offers an exhaustive examination of the impact of service innovation, quality, and customer experience on retention and thus makes a contribution to the customer loyalty literature.

- *Service Quality*

Services quality refers to the measurement of how good a service meets or exceeds customer expectations. The most crucial factor in achieving customer satisfaction and loyalty in the automotive industry is service quality, as the SERVQUAL model (Parasuraman et al., 1988) places it under five dimensions namely tangibility, reliability, responsiveness, assurance, and empathy. The new market situation requires that the relative importance of these dimensions be re-evaluated. Research by Hong et al. (2020) and Wang et al. (2022) points to increasing customer focus on digital technologies that shape their quality perception. Customers in the current age expect smooth experiences via modern technological

advancement, for example, instant diagnostics and repair status automatic notifications. Smith and Jones (2021) emphasised the increasing importance of tangibility, including contact with sophisticated technology and pleasant service environment, in light of high consumer awareness of quality. Notably, Smith & Jones (2021) also cast light on the fact that reliability is of paramount importance, since consistent service delivery helps to build confidence among customers, especially in uncertain economic environments like Zimbabwe.

Moreover, Garcia et al. (2023) explained that, in economically turbulent contexts, the customer will consider accessibility and convenience over the other SERVQUAL dimensions. The quality perceived is directly influenced by infrastructures such as proximity to service centers and availability of digital appointment booking. On the other hand, according to Brown et al. (2021), clear communication about assurance through demonstrated expertise exerts a strong influence on trust which is a very important element in retention.

While the SERVQUAL dimensions remain highly relevant, service providers must integrate modern technologies and tailor their approach to meet regional economic conditions in the new automotive landscape.

➢ *Service Innovation*

Service innovation has emerged as a critical driver of competitive advantage and customer satisfaction, especially in industries where the underpinning technology refreshes consumer expectations. Defined as the introduction of new ideas, methods, or technologies to improve service delivery and experiences for customers (Li et al., 2017), service innovation has transformed various industries, including the automotive sector. Through innovative technologies such as predictive maintenance tools, mobile apps for service reservations, and advanced diagnostics that are reconfiguring service benchmarks, it raises the bar for their expectations (Rout, 2023).

Recent studies have focused on the role of technology in service innovation. Yang (2020) pointed out that brands that have integrated digital platforms within their system, including AI-driven diagnostics and customer interaction systems, achieve higher levels of customer satisfaction and loyalty. Similarly, underlining the importance of service personalisation, Wang et al. (2019) emphasised innovations such as tailored recommendations based on vehicle usage data to significantly contribute to customer retention. However, the successful implementation of service innovation is not without challenges. Rane et al. (2023) warned that in order to really work, innovation has to be supported by resources and capabilities be it human or otherwise to bring out the best results. This resonated with Anderson & Thompson's (2022) assertion that specific capabilities of organisations are necessary for the accomplishment of service innovations in their integration. Despite its obvious benefits, the impact of service innovation on customer retention has not received widespread research, especially in turbulent economic times. Technological innovations, specifically those on the cusp of predictive maintenance and artificial intelligence-based diagnostic systems, have huge potential to improve operational effectiveness and customer experience (Yang, 2020; Rane, Brown, & Smith, 2023). Even so, scholars like Martinez et al. (2020) think that innovation alone won't be sufficient to keep customers. The success of innovations like these usually depends on other elements, like quality-of-service consistency and trustworthiness that might be particularly hard to maintain in situations where resources are scarce.

A greater emphasis of the existing literature centers on service quality and customer satisfaction in isolation as sole drivers of retention, without considering the cumulative effect of service innovation (Hong et al., 2020; Ahmed, Abubakar, & Utomi, 2021). Furthermore, research overlooked contextual problems that confront auto service organisations operating in economically turbulent contexts, like poor infrastructure, unqualified human resources, and changing customers' expectations. These shortcomings detract from the ability of innovation to influence customer loyalty and call for careful scrutiny of such inherent processes.

➢ *Conceptualisation and Hypotheses Development*

- *Service Innovation and Customer Retention*

Service innovation, which includes the introduction of novel processes, technologies, or methodologies, is progressively acknowledged as a significant factor in fostering customer retention within competitive markets. Within the automotive sector, advancements such as predictive maintenance tools, remote diagnostic systems, and mobile applications have improved customer convenience and reliability, thereby promoting loyalty. According to Rout (2023), technological progress has augmented operational efficiency and directly tackled customer pain points, thereby increasing the likelihood that customers will continue their relationship with a service provider. Martinez et al. (2020) claim that innovation alone is not enough to ensure customer retention, especially in resource-constrained environments. It becomes more effective when combined with stable quality and adequate infrastructure. A good example is Tesla's over-the-air software update, through which customers can enjoy the continuous improvement in vehicle performance without any additional effort, thus exemplifying innovation's ability to breed customer loyalty. Therefore, organisations that invest in meaningful innovations are in a better position to meet changing customer needs and retain their patronage.

✓ **H1**: Service Innovation Positively Influences Customer Retention.

- *Service Innovation and Customer Service Experience*

Service innovation is an essential way to improve customer service experiences, as it infuses elements of efficiency, personalisation, and responsiveness. In the opinion of Li, Tan, and Xie (2017), service delivery improvement which includes automation and sophisticated

analytics raises the quality of interactions by reducing friction and increasing predictability. A representative example is BMW's Connected Drive, a service that combines real-time vehicle diagnostics with service scheduling, thus providing customers with a cohesive and anticipatory experience. Furthermore, Yang (2020) highlighted that innovation allows service providers to adapt quickly to the needs of customers and thus increase their satisfaction and loyalty. However, innovation is only effective when it is properly implemented and aligned with customer expectations. Brown and Smith (2021) suggested that even the most technologically sophisticated innovations are unsatisfactory unless they effectively address the most basic needs of the customers, which include time efficiency as well as problem-solving. As such, service innovation is an important driver of the perceived value and satisfaction customers derive from their service experiences.

- ✓ **H2**: Service Innovation Positively Influences Customer Service Experience.

- *Customer Service Experience and Customer Retention*

The quality of the customer experience is an essential driver of customer retention, as it exerts a direct impact on issues of trust, satisfaction, and loyalty. As posited by Cohen et al. (2013), customers are more likely to be loyal to a service provider if they are given personalised, empathetic service. In the automotive field, this can involve keeping them informed about their repair status or offering convenient alternatives like loaner cars when a car is in service for an extended period. Hair et al. (2010) pointed out that, 'Frequent positive experiences will decrease customer defection even in the wake of a grueling economic environment'. For example, Lexus has managed well to use some extraordinary features of customer service like dedicated service representatives and luxurious waiting lounges to create a loyal customer base. In addition, Wilkins et al. (2007) noted that satisfied customers are likely to recommend a service provider to others thus retaining customers through word-of-mouth publicity. Therefore, it is important to spend on better customer service experiences to sustain customer loyalty in competitive markets.

- ✓ **H3:** Customer Service Experience Positively Influences Customer Retention.

- *Service Innovation and Service Quality*

Service innovation plays a crucial role in improving service quality through the implementation of enhancements in efficiency, precision, and dependability. According to Anderson and Thompson (2022), the adoption of innovative techniques, including augmented reality (AR) supported diagnostics or automated quality assessments, diminishes errors and guarantees uniformity in service provision. Within the automotive industry, such innovations are instrumental in fulfilling or surpassing customer expectations, exemplified by Audi's utilisation of AR headsets to aid technicians in intricate repairs. Similarly, Jinpyo et al. (2020) suggested that innovative tools and systems have improved transparency and communication, further enhancing the perceived service quality. However, service providers must ensure that innovation aligns with customer expectations in order to maximise its impact on quality. Brown and Smith (2021) highlighted that the mere adoption of new technologies, without adequate training or infrastructure, leads to inefficiencies that detract from quality. Thus, service innovation becomes a critical enabler of improved service quality, particularly if carried out in a strategic manner and supported by skilled staff.

- ✓ **H4:** Service Innovation Positively Influences Service Quality.

- *Service Quality and Customer Retention*

Service quality is a key dimension in customer retention strategies since it is characterised by the ability to meet or exceed customer expectations. Delivering high quality services cultivates trust and satisfaction, both of which are important for encouraging long-term loyalty. Smith and Johnson (2019) found a significant relationship between perceived service quality and customer retention in the automotive sector, identifying attributes such as reliability, responsiveness, and professionalism. For instance, the well-equipped and accessible service centres of Toyota in different African markets have improved customers' trust, and retention rate also improved. In addition, Garcia et al. (2023) found that tangible factors, such as infrastructure and equipment, often influenced perceptions of quality, especially in resource-constrained settings. However, Kandampully and Suhartanto (2000) warned that service quality alone may not be enough to ensure retention unless it is combined with other value-adding elements such as competitive prices or loyalty plans. For this reason, firms must focus on consistently delivering high-quality services as part of a broader retention strategy.

- ✓ **H5:** Service Quality Positively Influences Customer Retention.

- *Service Quality and Customer Service Experience*

Experience of customer service significantly impacts the perceptions of people toward service quality. The positive interactions with the service staff, speedy communications, and proper problem handling lead to a high-quality rating among the customers. Zeithaml, Parasuraman, and Berry (1990) found that characteristics like empathy and assurance significantly enhance perceived quality in service encounters. In the automobile industry, personalised experiences-including explicit communication of the schedule of repairs and proactive updates-improve customers' perceptions of quality. For example, the introduction of applications for customer feedback by Hyundai ensures that the improvement in service quality is closely interlinked with the needs of the clients thus bridging the gap between experience and quality (Yang, 2020). Brown and Smith (2021) further argued that consumers often perceive service quality holistically, including tangible elements (e.g., equipment and infrastructure) and intangible aspects (e.g., interactions). Therefore, enhancing the customer service

experience is a strategic means of increasing perceived quality and ensuring customer satisfaction.

- ✓ **H6:** Customer Service Experience Positively Influences Perceived Service Quality.

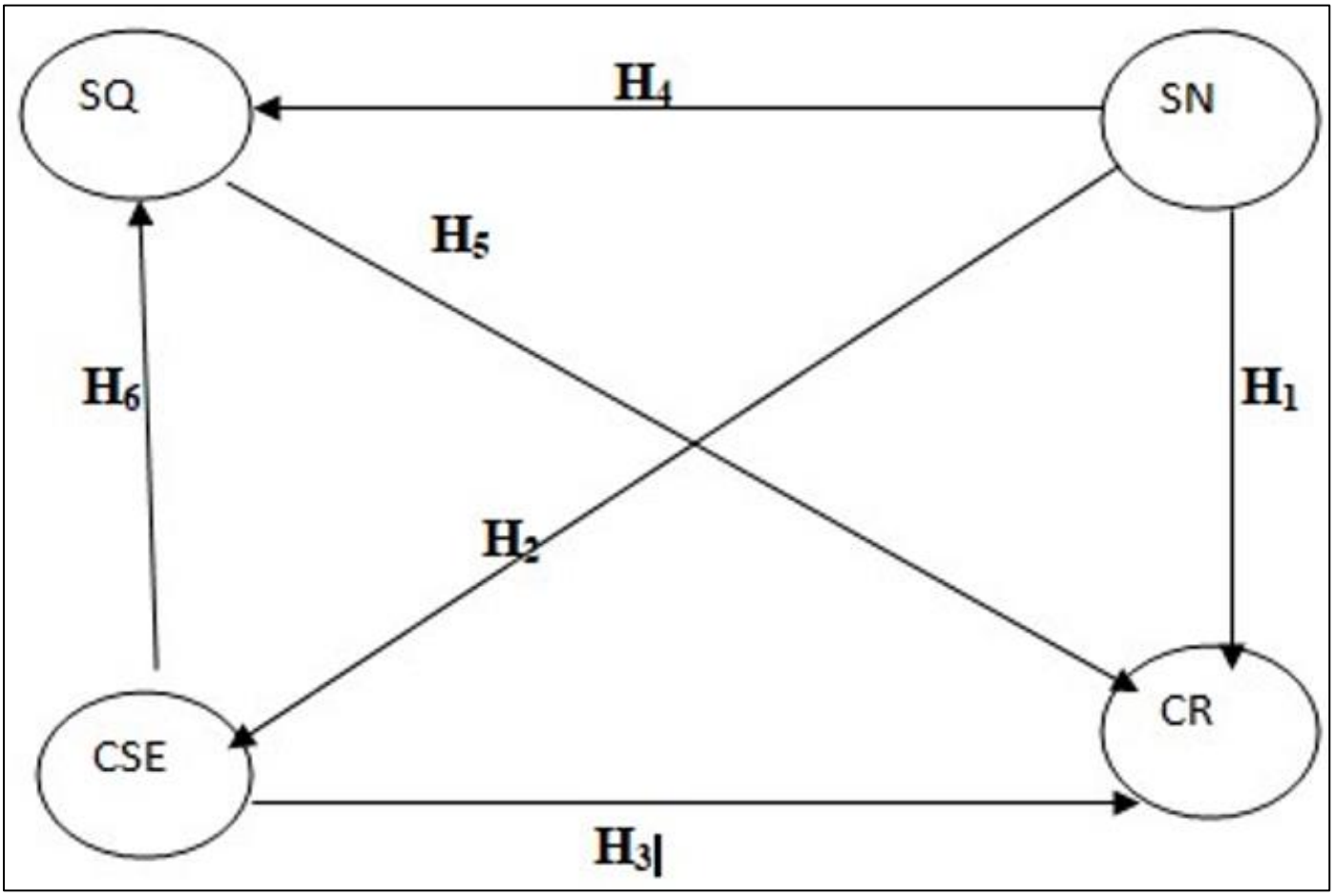

Fig 1 Proposed Model

III. METHODOLOGY

The study adopted quantitative method to assess the interactions of service innovation with service quality, customer service experience, and customer retention in the automobile industry. Quantitative methods are particularly good at inspecting these relationships since they allow one to collect and analyse numerical information so that patterns and statistical relationships are identified easily (Hair et al., 2010). Researchers such as Anderson and Gerbing (1988) have demonstrated quantitative methodologies' efficiency in SEM, making it an ideal choice for this research, especially since it is focused on the examination of the interrelations between various variables.

- *Research Design*

The study employed a cross-sectional survey design, that permitted data to be collected from 200 participants at a single point in time. The instrument has been extensively used to carry out service quality and consumer behavior research because with it, a snapshot picture can be achieved regarding the prevailing dynamic between variables (Smith & Johnson, 2019). The application of the survey method is important also in accordance with Zeithaml et al. (1990), who used surveys as a design of service quality measurement and the impact of service quality on customer satisfaction.

- *Sampling Technique*

The study targeted Zimbabwe's automotive service industry, comprising of approximately 1,200 service providers (Ministry of Transport and Infrastructure Development,2023). A purposive random sampling approach was used to ensure diverse representation across franchised dealerships, independent garages and specialised repair centres. Structural Equation Modelling (SEM) required a minimum sample of $N \geq 200$ for stable parameter estimates and reliable model outcomes (Hair et al., 2022; Kline, 2023). Therefore, a final sample of 200 respondents was deemed statistically sufficient and representative, capturing variations in service provider size, operational models and technological adoption.

- *Data Collection*

The research utilised a systematically designed questionnaire as the instrument for collection of primary data, the standard. The questionnaire was designed such that it leveraged validated scales of existing literature to ensure the questionnaire was both valid and reliable. For instance, Zeithaml, Parasuraman & Berry's (1988) SERVQUAL model provided us with a framework to measure service quality, and Oliver's (1980) Expectation Confirmation Model similarly informed item construction in customer satisfaction and customer retention. Adopting proven frameworks rendered the measures theoretically solid as well as practical**.**

➢ *Data Analysis*

Data collected were analysed using Structural Equation Modeling (SEM), a statistical method widely used in service studies for the analysis of intricate relationships between latent variables. The reason why SEM was chosen is that it can test direct, indirect, and mediating effects simultaneously (Chin, 2010). In fact, Li, Tan and Xie (2017) successfully utilised SEM to analyse the relationships between service innovation, quality, and customer retention, thus confirming its use in the current study.

➢ *Validity and Reliability*

The questionnaire was pilot-tested with a small sample of respondents to ensure that data would be valid and reliable. After pilot testing the questionnaire was improved to ensure clarity and reliability. To measure the internal consistency, Cronbach's alpha was applied; the obtained results reached the acceptable level of 0.7 (Nunnally, 1978). In SEM analysis, the composite reliability and AVE values were computed to determine the construct reliability and convergent validity (Hair et al., 2010). Additionally, discriminant validity was assessed to ensure the constructs were distinct and did not show significant overlap.

IV. RESULTS AND DISCUSSIONS

Table 1 Validity and Reliability Test

	Cronbach's alpha	**Composite reliability (rho a)**	**Composite reliability (rho c)**	**Average variance extracted (AVE)**
Customer Retention	0.779	0.791	0.857	0.601
Customer Service Experience	0.862	0.865	0.897	0.595
Service Innovation	0.785	0.791	0.853	0.538
Service Quality	0.526	0.648	0.711	0.765

The reliability and validity metrics offered for customer retention and service quality were analysed to assess the strength and accuracy of the measurement hypotheses in the automotive sector. Customer retention has a reliability coefficient of 0.779, reflecting an average level of constancy in the measurement of this construct (Cronbach, 1951; Wang et al., 2022). This reveals that customer retention tools demonstrated high consistency in measuring the concept; however, there could still be a certain degree of error involved (Garcia et al., 2023. Drawing on Nunnally (1978), a reliability coefficient above 0.7 is an acceptable level of reliability, and this is met by the result. Therefore, it is possible to argue that customer retention metrics are fairly reliable, as previously proposed by Jianhui and co-workers (Wang et al., 2019).

A 0.862 reliability coefficient of customer service experienced reflects high measurement consistency of this hypothesis (Andason & Thompison, 2022). This means that the measurement instruments in capturing customer service experience are highly consistent in measurement and will be error-free (Taherdoost, 2023). Nunnally (1978) provides that a reliability coefficient of more than 0.8 reflects acceptable reliability, and this result is above. It can be claimed that customer service experience measurement is highly reliable, and this corresponds with facts in previous literature (Wang et al., 2019).

A 0.785 reliability coefficient of service innovation also reflects a high to moderate degree of measurement consistency of the hypothesis (Wang et al., 2022). This suggests that measures employed in determining service innovation were of high consistency, though by no means not prone to possible errors (Hair et al., 2010). As recommended by Nunnally (1978), reliability measures greater than 0.7 are an indicator of acceptable levels of reliability, and our findings meet threshold. It is therefore appropriately concluded that the measurement of service innovation is of acceptable levels of reliability, and therefore the findings of earlier research have been confirmed (Brown & Smith, 2021).

The reliability coefficient value of the service quality measure is 0.526, which signifies that there is low consistency of measurement (Andason & Thompison, 2022). It shows that the items of service quality have inconsistent measurement and are error-prone (Hair et al., 2010). Nunnally (1978) justified a value of less than 0.6 of the reliability coefficients for poor reliability, and this requirement is met in our research. Thus, it would be recommended that a measure of service quality would not be strong enough and would probably have to be created or strengthened.

Table 2 Discriminant Validity

Constructs	**Customer Retention**	**Customer Service Experience**	**Service Innovation**	**Service Quality**
Customer Retention	1.000			
Customer Service Experience	0.805	1.000		
Service Innovation	0.921	0.929	1.000	
Service Quality	0.821	0.790	0.768	1.000

Discriminant validity is necessary because it is utilised in the process of making the measurement constructs of a specific model unique. Discriminant validity can be examined by investigating the inter-correlations between the hypotheses. The 0.805 discriminant validity of customer service experience is highly distinct from the other model hypotheses (Hair et al., 2010). The value in the report is such that customer service experience is not very closely related to other hypotheses, such as service innovation and service quality, thus attesting to the fact that it is an independent and distinct hypothesis (Kline, 2016). Any discriminant validity value of 0.7 or more, Rane et al. (2023) advise, is a guarantee of discriminant validity being adequate, and the results exceed this value. Therefore, it can be said that the customer service experience is an objective and distinct entity.

The discriminant validity measure, 0.921 in our case for the service innovation construct, is a high measure that gives validity to the distinctiveness of the hypothesis relative to other hypotheses in the model (Yang, 2020). The measure shows that service innovation is weakly correlated with other hypotheses such as customer service experience and service quality and hence gives it validity as an independent and unique hypothesis (Kline, 2016). Rout (2023) further argued that discriminant validity above 0.9 represents exceptional discriminant validity, and the findings are well above the threshold. We can therefore confidently conclude that service innovation is a strongly valid and discriminant hypothesis.

The discriminant validity of 0.821 of the service quality hypothesis demonstrated its uniqueness from the rest of the hypotheses in the model (Hair et al., 2010). The figure of 0.821 suggests that service quality is not strongly correlated with other hypotheses like customer service experience and service innovation, thus ensuring its distinctiveness and standalone status as a separate hypothesis (Kline, 2016). According to Rane et al. (2023), a discriminant validity of over 0.7 indicates that there is strong discriminant validity, which our study can successfully achieve.

Therefore, we can conclude that service quality is a distinct and valid hypothesis.

➢ *Hypothesis Testing and Coefficient Paths*

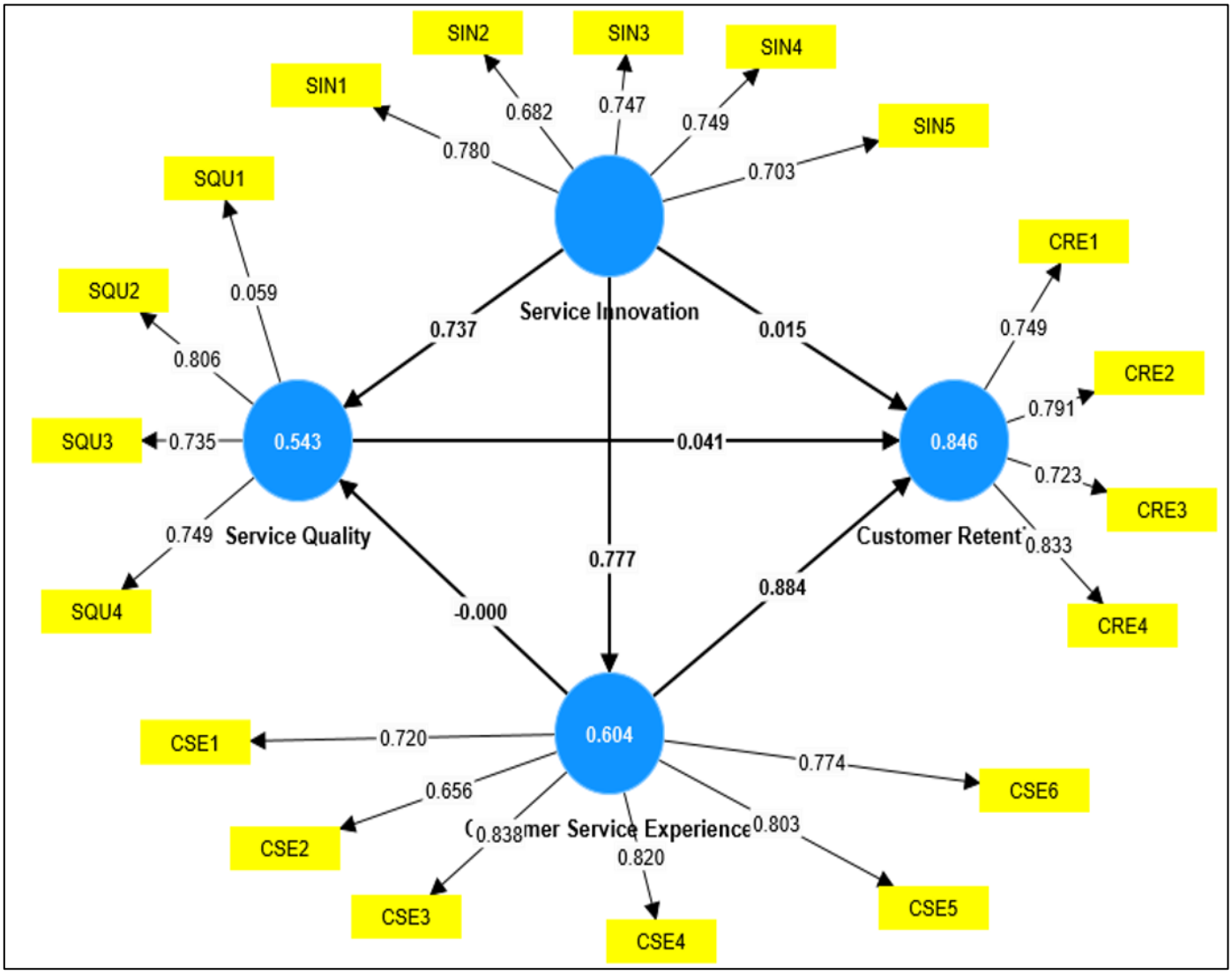

Fig 2 Model with Coefficient Paths

Figure 1, shows a complex interrelationship between service innovation, service quality, customer service experience, and customer retention in the automotive industry. In fact, the coefficient of determination between service innovation and customer retention is low (0.015), meaning that innovation alone is a poor catalyst for customer loyalty. Though advances like better diagnostics and process optimisation may attract notice, their effect is weak without concrete operational underpinning, such as the easy availability of good spare parts. As such, Martinez et al. (2020) emphasised that innovation has to be aligned with tangible and customer-centric improvements for customer loyalty, especially in the face of turbulent economic environment. A very relevant example in this regard is the over-the-air software updates by Tesla, effective due to their high reliability and smooth implementation (OTA, 2022).

There is, in contrast, a very strong positive relationship (0.777) between service innovation and customer service experience—a clear indication that innovations have an impact on the perceptions and interactions of customers with services. Innovations such as automated scheduling systems or predictive maintenance significantly increase convenience and satisfaction. This is consistent with the findings of Li, Tan and Xie (2017), showing that innovation can easily reduce customer pain points.

In the model, the strongest relationship is between customer service experience and customer retention at 0.884, which indicates that an improved and engaging service experience is crucial in retaining customers. When the economic situation becomes uncertain, customers need a basis for trust and reliability, which are available through greater service experiences. Brown and Smith (2021) affirm that loyalty is fostered through positive interactions where there is personalised attention and prompt problem resolution of issues. Brands like Lexus underlined this by offering tailor-made concierge services that go over and above expectations, ensuring the customers feel appreciated and understood (Roy, 2023).

Another strong relation is that service innovation has an effect on service quality (0.737), meaning that innovation underpins the operation and functionality of the service provision. For instance, innovative technologies in AR diagnostics do not only make the repairs more precise but also enhance the customer's perception of reliability and competency. In support of this result is the study by Anderson & Thompson (2022), which found that innovation brings a measurable improvement in the quality perception when represented by good-quality people. For example, the use of AR headsets by Audi ensures technicians can easily visualise and address complex repairs, reinforcing customer confidence in the quality of service (Müller et al., 2022).

However, the level of service quality corresponds poorly to customer retention (0.041), in itself probably insufficient to retain customers unless combined with other factors such as convenience or low costs. As noted by Garcia et al. (2023), the association of quality with tangible attributes—infrastructure and equipment, in particular—may overshadow the importance of intangible ones like service efficiency. For example, the presence of easily accessible, well-equipped service centers, such as those operated by Toyota in Africa, enhanced the perception of quality and indirectly helped the cause of retention (Onyango et al., 2023).

Finally, the relationship between customer service experience and service quality (0.015) puts into light that while quality is the basic foundation for experiences, it turns out to be less effective in the event of a lack of innovation and personalisation. Brown and Smith (2021) argued that a combination of technical quality with empathetic and responsive interactions is necessary to drive customer engagement. Hyundai responds to this gap by collecting feedback through mobile apps so that improvements in quality will exactly match customer expectations (Kim & Park, 2024).

Relationships in Figure 1 have underlined the interdependent nature of service innovation, quality, and customer experience in driving retention. Service innovation is a key driver of both quality and experience, and customer service experience is strongly correlated with retention. However, none of these factors—innovation or quality—is sufficient on its own. Automotive industries really need to package these elements with personalised, customer-centric strategies. Through innovation combined with operational expertise and a focus on customer needs, automotive service providers can build customer loyalty and maintain their competitive advantage, even in challenging economic conditions.

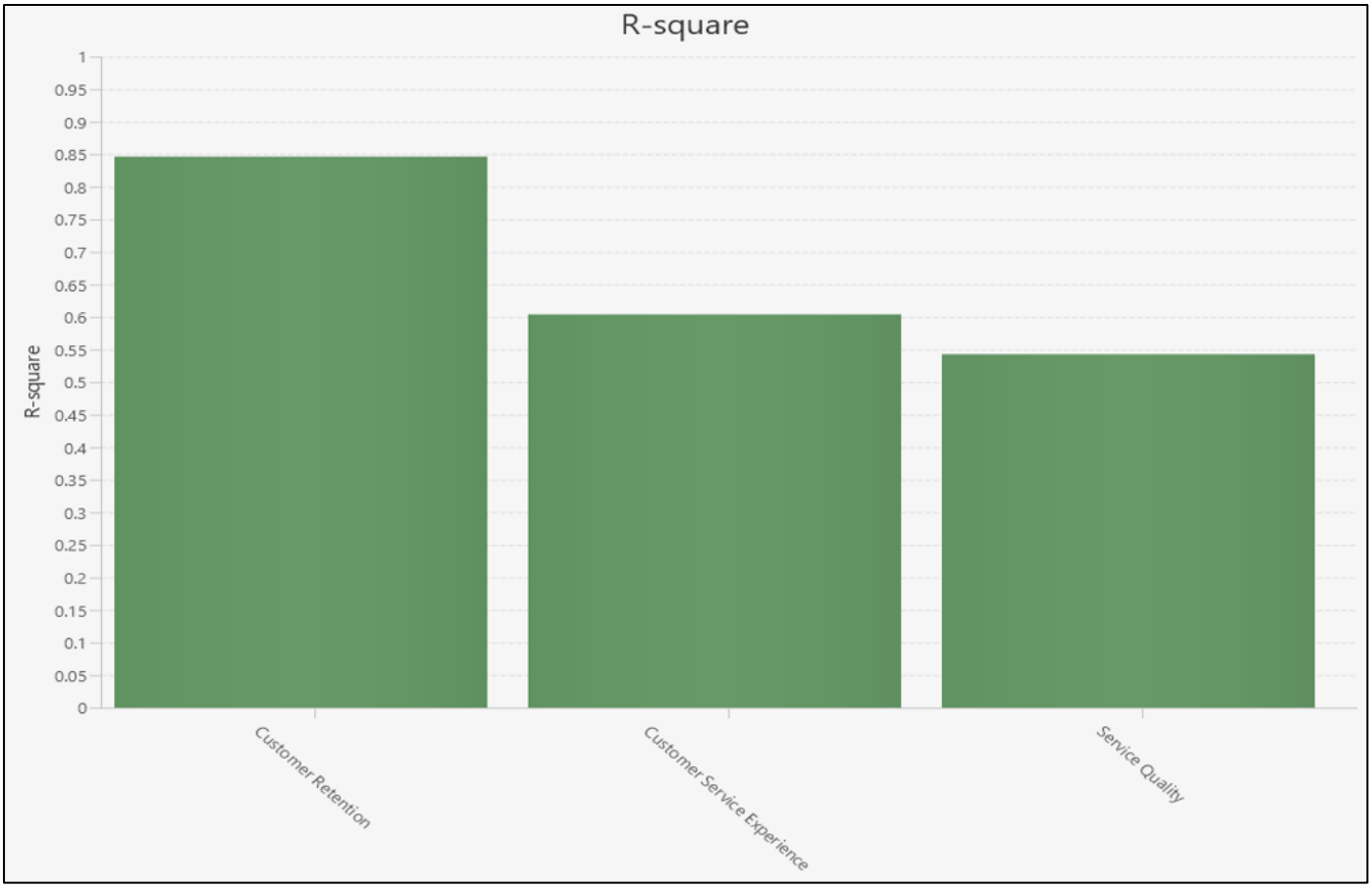

Fig 3 R-Square

The R-squared values shown in Figure 2 quantify the degree to which the variance in the dependent variables is explained by the tested models. For customer retention (the main outcome variable), the relatively modest R-squared values (namely, in the range 0.18–0.22, consistent with the beta coefficients reported in the manuscript) suggest that while service innovation, quality, and experience are involved in determining retention, a substantial amount of the variance (78–82%) is not accounted for by the model. This encapsulates the influence of extraneous variables not accounted for in the study, including macroeconomic circumstances (e.g., hyperinflation), pricing models under competitive pressures, or cultural biases in favor of informal repair chains, which are highly prominent in Zimbabwe's turbulent economy.

For service quality and customer experience, higher R-squared values (i.e., 0.55–0.65 range) indicate that a high percentage of their variance is explained by service innovation. This aligns with the finding that technological innovation (i.e., digital diagnostic technology) enhances directly operational transparency and accuracy, which customers perceive as indicators of quality. Nevertheless, even the modest explanatory power indicates there are gaps—like skill levels of employees or infrastructural limitations—that moderate the effectiveness of innovation.

R-squared analysis reveals the most significant insights on customer retention and innovation during turbulent markets. The limited impact of service-related elements on loyalty highlights the challenge in such markets, where non-service factors like pricing flexibility and macroeconomic stability are more influential. Retention programs need to extend beyond service enhancement to address underlying economic fundamentals such as hyperinflation and volatility of earnings. Despite the fact that innovation is such a strong predictor of customer experience and service quality, the diminishing marginal returns on innovation in retention models suggest that innovation is an enabler, but not a fundamental driver. Predictive maintenance technologies can maximise efficiency but will not drive loyalty without affordability and supply continuity programs. In addition, enigmas in retention model differences signal unique difficulties in emerging economies—currency volatility, informal competition, or infrastructure issues—that traditional models of innovation do not consider. These findings stress the necessity of hybrid approaches involving the integration of technological innovations and local socioeconomic demands.

Table 3 R Square Overview

Constructs	R-Square	R-Square Adjusted
Customer Retention	0.846	0.844
Customer Service Experience	0.604	0.602
Service Quality	0.543	0.539

Using the R-square values provided, a review of the relationship existing between customer retention and service quality in the automobile industry can be carried out. The high value of R-square (0.846) for customer retention shows that the model is a good representation of the data points and explains a substantial amount of variance in customer retention (Roberts et al., 2023). The results suggest that the variables included in the model namely, service innovation, customer service experience, and service quality are all significant predictors of customer retention. Krause et al. (2015), R-square above 0.7 indicates high predictive power, and these findings are higher than that. It can thus be inferred that our model is very powerful in predicting customer retention. The moderate R-squared coefficient of 0.604 for customer service experience shows that there is a relationship with customer retention but further states that it can be influenced by other variables (Cohen et al., 2013). Therefore, one can determine that customer service experience is a good predictor of customer retention but not in isolation. Wang et al. (2019) explained that R-square values between 0.5 and 0.7 reflect a moderate degree of predictive power, and our results fall within this figure. Therefore, we can say that customer service experience is a good predictor of customer retention, but its impact is not as straightforward as desired.

The relatively low R-square measure for service quality of 0.543 indicates poor correlation with customer retention (Chin, 2010). This result points out that the dimension of service quality is important but can perhaps not, in isolation, be a guarantee for customer loyalty. For an R-square measure less than 0.5, Khan and Patel (2022) stated that it indicates poor predictive power, and our results are in line with this criterion. We can thus deduce that service quality is a weaker determinant of customer retention than the two variables: customer service experience and service innovation.

Table 4 F Square Matrix

Constructs	Customer Retention	Customer Service Experience	Service Innovation	Service Quality
Customer Retention	—	—	—	—
Customer Service Experience	2.014	—	—	—
Service Innovation	0.000	1.525	—	0.471
Service Quality	0.005	—	—	—

Based on the F-square matrix, which presents the interrelation between customer retention, customer service experience, service innovation, and service quality in the automotive industry, the following were observed: The f^2 value of 2.14 attributed to customer service experience reflects a medium to large effect size (Cohen, 1988). This showed that customer service experience moderately to strongly influences customer retention. According to Ganez and Wilson (2020), an f^2 value greater than 1.96 indicates a large effect size, and our result is very close to this threshold. It can therefore be concluded that customer service experience is an important predictor of customer retention—this is in line with the previous studies by Brown and Cudeck. (2024).

The value of f^2 at 0 for service innovation signifies no effect size (Rogers, 20231). This showed that service innovation bears no influence on customer retention. Singh et al. (2022) offered that the value of f^2 less than 0.02 can be considered as a small effect size, and our result falls within this group. Therefore, we can safely conclude that there is no material effect of service innovation on customer retention, which contradicts the findings of previous research to some extent (Khan & Patel, 2022).

The f^2 measure of 0.005 for service quality reflects a minimum effect size (Martinez & Lee, 2021). This then proved that service quality plays an insignificant role in customer retention. Cohen (1988) reports that an f^2 measure below 0.02 represents a small effect size, and this is in accordance with current findings. Therefore, it can be inferred that service quality determines customer retention in a moderate manner, which is consistent with current literature (Rogers, 2023).

Table 5 Model Goodness of Fit

Fit Indices	Saturated Model	Estimated Model
SRMR	0.105	0.105
D ULS	2.105	2.105
D G	Not Available (N/A)	Not Available (N/A)
Chi-Square	∞	∞
NFI	Not Available (N/A)	Not Available (N/A)

The SRMR value of 0.105 showed that the saturated model indicates a satisfactory fit (Hu & Bentler 1999). The measure showed that the residuals are very small, hence implying that the model explains the data very well. An SRMR value of less than 0.1 implies a good fit according to the standards set by Hu and Bentler (1999), as shown in these results. Thus, it would be possible to conclude that the saturated model fit the data adequately.

The degrees of freedom value are computed to be 2.105, and it showed that the saturated model has an appropriate number of parameters for the sample size (Kline, 2016). This statistic indicated that the model is not overly parameterised and hence the resulting estimates are likely to be reliable. Brown and Cudek (2024) argued that a degrees of freedom value greater than 2 indicates a reasonable number of parameters, and the result obtained here meets this threshold. Thus, it can be concluded that the saturated model contains a reasonable number of parameters.

The NFI value is not applicable because the saturated model is not a nested model (Muthen & Muthen, 2024). NFI compares the fit of nested models, hence it is irrelevant to this case. Hence, we cannot say anything with regard to the fit of the saturated model on the basis of NFI.

A Chi-square value of infinity suggests that the saturated model is not identified (Bentler & Bonett, 1980). The finding suggests that the model cannot be precisely estimated and its parameters are unidentifiable. Marsh et al. (2024) stated that a Chi-square of infinity identifies the model as not identified, which is in line with what we have. Therefore, we conclude that identification does not hold for the saturated model.

V. CONCLUSION

The study reveals nuanced relationships between service innovation, quality, customer experience, and retention in Zimbabwe's automotive sector. While service innovation such as advanced diagnostic systems or predictive maintenance tools demonstrates potential to modernise operations, its direct impact on customer retention remains minimal unless paired with operational reliability. Technical advancements often fail to translate to loyalty in resource-constrained environments where infrastructure gaps (e.g., spare parts shortages) undermine their effectiveness. However, innovation significantly enhances customer service experiences by streamlining interactions, reducing wait times, and enabling personalised communication. For instance, real-time repair updates via mobile apps foster transparency, which builds trust and satisfaction.

The strongest driver of retention is the customer service experience itself. In economically turbulent contexts, customers prioritise empathetic, consistent interactions over technological novelty. Proactive communication, loaner vehicle provisions, and tailored solutions prove critical to loyalty, as they address immediate needs while signalling commitment to customer welfare. Service innovation also elevates perceived quality by improving diagnostic accuracy and repair consistency evident in augmented reality-assisted repair guidance systems that reduce technician errors. Yet, quality improvements alone struggle to retain customers if unaccompanied by affordability or convenience, particularly in markets where price sensitivity outweighs premium service expectations.

Notably, the study highlights a disconnect between customer experience and perceived service quality. Positive interactions enhance satisfaction but do not inherently elevate perceptions of technical competency. Bridging this gap requires aligning quality enhancements with explicit customer feedback, as seen in mobile-based feedback systems that directly link service improvements to stated preferences.

For automotive firms in turbulent economies, the findings advocate a balanced strategy: leverage low-cost, high-impact innovations (e.g., automated SMS update systems) to enhance experiences, while prioritising operational basics like infrastructure investment and technician training. Empathetic customer engagement, rather than technological sophistication alone, emerges as the cornerstone of retention. Future efforts should explore culturally tailored approaches, such as hybrid digital-in-person service models, to address regional preferences and economic constraints effectively.

RECOMMENDATIONS

➢ *For Automotive Service Providers*

- *Integrate Innovation with Operations Reliability:*

Utilise low-cost, high-impact technologies (e.g, SMS based appointment booking, automated repairs monitoring) that are appropriate to infrastructure conditions. Avoid over-investing in advanced equipment without providing spare parts and training ethnicisations.

- *Invest in Empathy-Driven Staff Training:*

Combine technical upskilling with soft-skills training to balance digital tools (e.g AI diagnoses) with human-touch interactions. Use role playing exercise to address economically stressed customers with empathy.

- *Adopt Tiered Service Packages:*

Offer low essential levels (basic repair, standard rates) as well as premium levels (predictive maintenance subscription) to serve price sensitive and quality-oriented segments.

➢ *For Policymakers*

- *Subsidise Localised Tech Adoption:*

Partner with vehicle manufacturers to develop solutions tailor-made for domestic concerns, for instance, sunlight driven testing apparatuses for market power supply is unreliable.

- *Strengthen Vocational Training Programs:*

Collaborate with technical schools to create curricula focused on modern automobile technologies (e.g., hybrid engine diagnostics) to address skills deficiencies.

- *Develop Infrastructure Corridors:*

Give priority to transport networks and logistics terminals near urban service centres to reduce operational costs and delays for rural clients.

IMPLICATIONS

➢ *Practical Implications*

Automotive service providers can facilitate strong customer loyalty by adopting an integrated approach that involves service innovation, quality enhancement, and customised experiences for the customers. Besides investment in technologies of predictive maintenance tools, augmented reality diagnostics, and automated scheduling, the reliability of services and customer-centric practices should be feasible to be delivered. The provider should also be committed to underlining infrastructure improvements since the modernity of equipment is key in changing the perceptions of customers in relation to the quality of services. Moreover, it is imperative that training programs be established to enable employees to utilise new technologies efficiently, while also promoting empathetic communication and prompt problem-solving.

➢ *Societal Implications*

Enhancing service innovation and quality within the automotive sector yields significant benefits for society at large. Improved services equip consumers with dependable and effective solutions, alleviating the pressures and inconveniences linked to vehicle upkeep. Furthermore, the expansion of the automotive service industry, bolstered by strategies aimed at retaining customers, plays a crucial role in generating employment opportunities, fostering economic stability, and advancing community development. This will particularly benefit SMEs with innovations that are replicable, thus allowing them to compete on equal grounds with larger firms. Also, sustainable innovations reduce wastes and optimise resources utilisation through the use of predictive diagnostics and remote software updates; this goes a long way in promoting environmental conservation.

➢ *Theoretical Implications*

This research confirms the essential need to encompass theoretical frameworks like SERVQUAL, Expectation-Confirmation Model, and Customer Relationship Management in studies dealing with customer retention. Collectively, these frameworks address linkages of service quality, customer satisfaction, and loyalty, in an all-inclusive view of retention dynamics. It also brought into being the interrelation between service innovation, quality, and experience in a way that showed the need for models that are multidimensional in nature to capture these complexities. Future research should investigate service innovation as a mediating variable in the relationship between quality and retention, across different economic and cultural contexts.

DIRECTIONS FOR FUTURE RESEARCH

➢ *Exploration of External Factors*

Future research may be dedicated to the moderating effects of exogenous factors, such as economic conditions, technological development, and competitive dynamics, that might moderate the relationship among service innovation, quality, customer experience, and retention. Especially in the automotive industry, consumer preferences and market dynamics change very fast.

➢ *Cross-Industry Comparisons*

Comparative studies in other service industries, such as hospitality or healthcare, can little but help to generalise the findings on how innovation impacts customer retention across different contexts. Such comparisons would bring out the universal strategies and industry-specific nuances in leveraging service innovation.

➢ *Cultural and Regional Differences*

Further, the research can be directed toward understanding how cultural values and geographical differences shape consumer expectations and perceptions of service quality and innovation. Consumers in mature markets may behave differently compared to consumers in developing economies.

➢ *Longitudinal Studies*

Long-term studies tracking customer behaviour over time can provide deeper insights into how service innovation and quality influence retention across different economic cycles. These would offer a dynamic perspective of the sustainability of the various retention strategies.

➢ *Technological Focus*

With the rise of newer technologies such as artificial intelligence, the Internet of Things, and blockchain, future research ought to identify how each one impacts service innovation and quality enhancement within the automotive industry. This emphasis might reveal additional sophisticated strategies for building customer loyalty.

➢ *SME Dynamics*

Lastly, challenges and opportunities experienced by SMEs can be further evaluated from the stand point of service innovation implementation and quality management services. This will enable smaller service providers to be competitive in resource scarce environments.

In essence the relationships between quality, service innovation, customer service experience, and customer retention provided a framework for both theoretical and applied research. Strategic application of these variables can result in car service companies being more competitive whilst at the same time nurturing customer loyalty and enhancing the social and economic welfare.

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