



Service Quality Improvement of Automotive 4S Stores Based on the 5GAP Model

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Abstract: To address the pervasive misalignment between service quality and customer expectations in automotive 4S stores and enhance their market competitiveness, this study investigates Chengdu X 4S Store, a luxury brand dealership. We integrate the 5GAP and SERVQUAL models to conduct a systematic analysis. Based on 220 valid survey responses, we employ SPSSAU for reliability and validity testing and quantitative statistics to identify five major service quality gaps and their root causes. The results reveal an overall service quality gap score of -0.1665 for the dealership. The most pronounced discrepancy is the Service Standards Gap (GAP2, -0.237). Within the Customer Perception Gap (GAP5), the complaint-handling process exhibits the largest shortfall (-0.413). This study's primary novelty lies in establishing an integrated "Dual-Model Framework – Quantitative Diagnosis – Targeted Intervention" methodology. Accordingly, we propose tailored strategies, including precise customer needs capture, optimized service standardization, enhanced employee competency, improved internal communication/collaboration, and a robust service recovery closed-loop system. Our work not only provides actionable solutions for the specific case but also offers a theoretical and practical paradigm for service quality management in luxury automotive 4S stores.

Keywords: 5GAP Model; Automotive 4S Store; Service Quality; SERVQUAL Model; Customer Satisfaction

1. Introduction

Amid intensifying market competition and rising consumer expectations, enterprises must not only attract customers with high-quality products before purchase but also sustain their satisfaction and loyalty by delivering exceptional after-sales service [1]. In 2025, China's automobile sales reached 34.4 million units, securing its position as the world's largest market for the 17th consecutive year. The luxury vehicle segment, in particular, has outpaced the broader market in growth, highlighting a pronounced consumer demand for professionalized and personalized services. As the primary service touchpoint, 4S stores are now confronted with significant challenges, including intense homogenized competition and rapidly evolving customer expectations.

Chengdu stands as a crucial automotive consumption hub in southwestern China. In the 2025 national city sales ranking, Chengdu topped the list with annual sales of 667,500 vehicles. Taking Chengdu X 4S Store—a core dealership for a luxury brand—as a representative case, this study examines a context marked by strong regional relevance. The dealership recorded annual new car sales exceeding 3,000 units and after-sales service visits surpassing 30,000 in 2025. Despite its scale, it faces notable service deficiencies, such as prolonged maintenance wait times, slow after-sales response, inadequate personalized service, and inefficient complaint handling. These issues have led to declining customer satisfaction, thereby constraining the store's competitive edge.

To address these challenges, this study employs an integrated analytical framework combining the 5GAP and SERVQUAL models. Through questionnaire surveys and quantitative analysis, we aim to identify the five key service quality gaps and their primary drivers for the case store, subsequently constructing a actionable strategy framework for improvement. A secondary objective is to validate the applicability of this dual-model approach within the context of luxury automotive 4S stores.

From a theoretical perspective, the integration of the 5GAP and SERVQUAL models overcomes the limitations inherent in applying a single model, thereby enriching the theoretical toolkit for automotive service quality assessment. It also fills a research gap by providing a quantitative analysis of service gaps specifically within luxury 4S dealerships. Practically, the findings are intended to offer targeted recommendations for process optimization and customer relationship management for the case store, while also serving as a valuable reference for similar establishments across the industry.

This research is structured around the sequence of "theoretical foundation–empirical analysis–strategy formulation–conclusion and outlook." It proceeds by reviewing relevant theories and prior research, designing and validating the survey instrument, quantifying service gaps, analyzing their root causes, proposing targeted improvement strategies, and finally summarizing the conclusions while acknowledging limitations and suggesting directions for future research.

2. Methodology and Materials

2.1 Research Methods

A comprehensive literature review was conducted using databases such as CNKI, WanFang, and Web of Science. Key search terms included "service quality," "5GAP model," "SERVQUAL model," and "automotive 4S store service management." This review systematically examined existing research, theoretical foundations, and methodologies to clarify the definitions and influencing factors of the five gaps within the 5GAP model. This process provided the theoretical underpinning for the study, ensuring its scientific rigor.

Drawing on the five dimensions of the SERVQUAL scale—Tangibles, Reliability, Responsiveness, Assurance, and Empathy [2], and integrating them with the core principles of the 5GAP model, a targeted questionnaire was designed. The questionnaire consisted of three sections: basic customer information, service expectations, and service perceptions, comprising a total of 22 items. A 7-point Likert scale was employed for scoring. The survey was distributed both online via Wenjuanxing and offline

at the dealership, targeting customers who had service experience at the X 4S store within the past year. Of the 250 questionnaires distributed, 220 valid responses were collected, yielding a valid response rate of 88%. This sample size was deemed sufficient for quantitative analysis.

Data analysis was performed using SPSSAU software. Reliability was assessed using Cronbach's alpha coefficient to test internal consistency, with an alpha value > 0.8 indicating excellent reliability. Validity was examined through the KMO measure and Bartlett's test of sphericity to verify construct validity, where a KMO value > 0.8 was considered suitable for factor analysis. Finally, the five major service gaps and individual item gap scores were calculated according to the SERVQUAL model formula to quantify specific service quality deficiencies.

2.2 Research Materials

This study selected X 4S Store as the research subject. As a flagship dealership for a luxury brand in Chengdu, it offers comprehensive end-to-end services and serves a customer base across Chengdu and its surrounding areas. Given its scale, business volume, and regional influence, the store is highly representative of the sector. The service quality issues identified within it demonstrate both typicality and generalizability, allowing the research findings to be extrapolated to similar contexts. The Service Gap Model, also known as the 5Gap Model, was first introduced in 1985 by American marketing scholars Parasuraman, Zeithaml, and Berry in their seminal paper, "A Conceptual Model of Service Quality and Its Implications for Future Research." It has since become one of the primary tools for quality management in the service industry [3]. Therefore, The questionnaire was designed to be both scientifically rigorous and contextually targeted. Its structure was based on the 5GAP model, with item dimensions assigned as follows:

Quality Perception Gap (GAP1): 5 items covering aspects such as the physical environment and post-service follow-ups.

Service Standards Gap (GAP2): 3 items related to service process standardization and staff competency.

Service Delivery Gap (GAP3): 7 items encompassing reception service, repair duration, and technical professionalism.

Market Communication Gap (GAP4): 4 items covering promise fulfillment and pricing transparency.

Perceived Service Quality Gap (GAP5): 3 items, including repair quality and complaint handling efficiency.

This resulted in a total of 22 items for analysis. The characteristics of the 220 valid samples align well with the actual market profile of the store: Gender: Male respondents ($n=128, 58.18\%$) slightly outnumbered female respondents ($n=92, 41.82\%$).

Age: The majority were aged 25-45 (71.82%), representing the core consumer demographic for luxury vehicles.

Service Type: Most visits were for maintenance and repair (70.91%), reflecting the predominant business structure of a 4S store. Data analysis was conducted using SPSSAU software (version 22.0) to perform reliability and validity tests and to calculate the gap scores. The sample demonstrates comprehensive coverage and sufficient representativeness, thereby providing a robust foundation for the subsequent empirical analysis.

3. Quantitative and Descriptive Statistical Analysis and Discussion

3.1 Reliability and Validity Analysis

Reliability analysis was conducted to assess the consistency and stability of the questionnaire data, employing Cronbach's alpha coefficient and Corrected Item-Total Correlation (CITC). The results indicated an overall Cronbach's alpha coefficient of 0.984 for the questionnaire, which significantly exceeds the threshold of 0.8 for excellent internal consistency. All individual CITC values were greater than 0.5. Furthermore, no scenario was observed where the removal of any single item resulted in an alpha coefficient exceeding the overall value. These findings collectively confirm strong correlations between each item and the overall scale, the absence of redundant items, and satisfactory data reliability, thereby validating the dataset for subsequent analysis (see Table 1).

Table 1. Results of Cronbach's Reliability Analysis

Item Descriptions	Corrected Item-Total Correlation (CITC)	Cronbach's Alpha if Item Deleted	Cronbach's Alpha Coefficient
Satisfaction with 4S Store Reception Service (Expectation/Perception)	0.734/0.774	0.984/0.983	0.984
Satisfaction with Services Actually Provided by 4S Store Staff (Expectation/Perception)	0.815/0.747	0.983/0.984	
Satisfaction with the Service Standards and Processes Established by the 4S Store (Expectation/Perception)	0.763/0.756	0.984/0.984	
Satisfaction with the Alignment between Advertised Promises and Actual Services of the 4S Store (Expectation/Perception)	0.769/0.788	0.984/0.983	
Satisfaction with the 4S Store's Environmental Quality (Expectation/Perception)	0.741/0.751	0.984/0.984	
Satisfaction with the Completeness and Arrangement of 4S Store Equipment (Expectation/Perception)	0.745/0.777	0.984/0.984	
Satisfaction with the Timeliness of 4S Store Services (Expectation/Perception)	0.826/0.778	0.983/0.983	
Satisfaction with the Professionalism of 4S Store Staff (Expectation/Perception)	0.741/0.797	0.984/0.983	
Satisfaction with the Repair Wait Time at the 4S Store (Expectation/Perception)	0.821/0.730	0.983/0.984	
Satisfaction with the Repair Quality at the 4S Store (Expectation/Perception)	0.765/0.734	0.984/0.984	
Satisfaction with the Reasonableness of Repair Charges and the Transparency of the Invoice at the 4S Store (Expectation/Perception)	0.820/0.742	0.983/0.984	
Satisfaction with the Service Progress Tracking at the 4S Store (Expectation/Perception)	0.759/0.762	0.984/0.984	
Satisfaction with the Attitude of Service Personnel at the 4S Store (Expectation/Perception)	0.751/0.757	0.984/0.984	
Satisfaction with the Post-service Follow-up and Care at the 4S Store (Expectation/Perception)	0.775/0.760	0.983/0.984	



Satisfaction with the Outcome of Complaint Handling at the 4S Store (Expectation/Perception)	0.777/0.810	0.983/0.983
Satisfaction with the Post-Sales Follow-up by the 4S Store (Expectation/Perception)	0.715/0.728	0.984/0.984
Satisfaction with the 4S Store's Online Service Platform (Expectation/Perception)	0.738/0.696	0.984/0.984
Whether the 4S Store Can Provide Caring Services That Exceed Expectations (Expectation/Perception)	0.799/0.773	0.983/0.984
Satisfaction with the Human-Centric Service System of the 4S Store (Expectation/Perception)	0.790/0.720	0.983/0.984
Whether Service Personnel Sincerely Apologize for Service Inconveniences (Expectation/Perception)	0.724/0.711	0.984/0.984
Satisfaction with the Overall Competence of Service Personnel (Expectation/Perception)	0.731/0.702	0.984/0.984
Satisfaction with the Overall Service Experience at the 4S Store (Expectation/Perception)	0.739/0.674	0.984/0.984

Note: Standardized Cronbach's $\alpha = 0.984$

Validity analysis was conducted to assess the effectiveness of the questionnaire items in measuring the research variables, employing the KMO test and Bartlett's test of sphericity. As shown in Table 2, the KMO value is 0.981, significantly exceeding the standard threshold of 0.8, indicating that the data are highly suitable for factor analysis. Bartlett's test of sphericity yielded an approximate chi-square value of 8149.235 with degrees of freedom (df) = 946 and a p-value = 0.000 (< 0.05), leading to the rejection of the null hypothesis of sphericity. This confirms significant correlations among the variables, attesting to the good structural validity of the scale and the scientific appropriateness of the questionnaire design.

Table 2. Results of the KMO and Bartlett's Test

Test Metrics	Value
KMO Value	0.981
Bartlett's Test of Sphericity (Approx. Chi-Square)	8149.235
Degrees of Freedom (df)	946
p-value	0.000

3.2 Quantitative Analysis of Service Quality Gaps

This study is grounded in the core SERVQUAL model formula: "SERVQUAL Score = Actual Perception Score - Expectation Score" [4]. By integrating this with the five-gap dimensions of the 5GAP model, a comprehensive service quality gap calculation framework is constructed. First, the mean customer expectation score (Esi') and mean perception score (Psi') were calculated for each questionnaire item. The individual item gap score (SQ_i) was then derived using the formula $SQ_i = Psi' - Esi'$. Subsequently, the composite gap score for each of the five dimensions was computed by weighting the item gap scores according to the number of items within that dimension. The specific calculation formulas are as follows:

$$SQ1 = (SQ5 + SQ16 + SQ17 + SQ18 + SQ22) / 5 \text{ (Quality Perception Gap)}$$

$$SQ2 = (SQ3 + SQ6 + SQ21) / 3 \text{ (Service Standards Gap)}$$

$$SQ3 = (SQ1 + SQ2 + SQ7 + SQ8 + SQ9 + SQ12 + SQ13) / 7 \text{ (Service Delivery Gap)}$$

$$SQ4 = (SQ4 + SQ11 + SQ19 + SQ20) / 4 \text{ (Market Communication Gap)}$$

$$SQ5 = (SQ10 + SQ14 + SQ15) / 3 \text{ (Perceived Service Quality Gap)}$$

$$SQ = (SQ1 \times 5 + SQ2 \times 3 + SQ3 \times 7 + SQ4 \times 4 + SQ5 \times 3) / 22 \text{ (Overall Service Quality Gap)}$$

The specific gap values for each item and the five major gaps, calculated using the formulas above, are presented in Table 3. The overall service quality gap value $SQ = -0.1665$, indicating that the perceived service quality at the X 4S store falls below customer expectations, and there is room for improvement in service quality. Based on the composite values of the five gaps, they are ranked from largest to smallest as follows: Service Standards Gap ($SQ2 = -0.237$) > Quality Perception Gap ($SQ1 = -0.1918$) > Perceived Service Quality Gap ($SQ5 = -0.16$) > Market Communication Gap ($SQ4 = -0.15075$) > Service Delivery Gap ($SQ3 = -0.13$). Among these, the Service Standards Gap is the most significant, while the Service Delivery Gap is relatively smaller.

Table 3. Service Quality Gap Calculation Results

Item No.	Item Content	Mean Expectation (Esi')	Mean Perception (Psi')	Item Gap Score (SQ_i)	Associated Gap Dimension
1	Satisfaction with 4S Store Reception Service (Expectation/Perception)	4.159	4.132	-0.027	GAP3
2	Satisfaction with Services Actually Provided by 4S Store Staff (Expectation/Perception)	4.382	4.386	0.004	GAP3
3	Satisfaction with the Service Standards and Processes Established by the 4S Store (Expectation/Perception)	4.336	4.127	-0.209	GAP2
4	Satisfaction with the Alignment between Advertised Promises and Actual Services of the 4S Store (Expectation/Perception)	4.477	4.141	-0.336	GAP4
5	Satisfaction with the 4S Store's Environmental Quality (Expectation/Perception)	4.441	4.282	-0.159	GAP1
6	Satisfaction with the Completeness and Arrangement of 4S Store Equipment (Expectation/Perception)	4.395	4.114	-0.281	GAP2
7	Satisfaction with the Timeliness of 4S Store Services (Expectation/Perception)	4.382	4.150	-0.232	GAP3
8	Satisfaction with the Professionalism of 4S Store Staff (Expectation/Perception)	4.527	4.209	-0.318	GAP3
9	Satisfaction with the Repair Wait Time at the 4S Store (Expectation/Perception)	4.441	4.273	-0.168	GAP3
10	Satisfaction with the Repair Quality at the 4S Store (Expectation/Perception)	4.218	4.314	0.096	GAP5
11	Satisfaction with the Reasonableness of Repair Charges and the Transparency of the Invoice at the 4S Store (Expectation/Perception)	4.445	4.309	-0.136	GAP4



12	Satisfaction with the Service Progress Tracking at the 4S Store (Expectation/Perception)	4.164	4.295	0.131	GAP3
13	Satisfaction with the Attitude of Service Personnel at the 4S Store (Expectation/Perception)	4.518	4.218	-0.300	GAP3
14	Satisfaction with the Post-service Follow-up and Care at the 4S Store (Expectation/Perception)	4.345	4.182	-0.163	GAP5
15	Satisfaction with the Outcome of Complaint Handling at the 4S Store (Expectation/Perception)	4.436	4.023	-0.413	GAP5
16	Satisfaction with the Post-Sales Follow-up by the 4S Store (Expectation/Perception)	4.418	4.141	-0.277	GAP1
17	Satisfaction with the 4S Store's Online Service Platform (Expectation/Perception)	4.359	4.259	-0.100	GAP1
18	Whether the 4S Store Can Provide Caring Services That Exceed Expectations (Expectation/Perception)	4.468	4.100	-0.368	GAP1
19	Satisfaction with the Human-Centric Service System of the 4S Store (Expectation/Perception)	4.264	4.096	-0.168	GAP4
20	Whether Service Personnel Sincerely Apologize for Service Inconveniences (Expectation/Perception)	4.259	4.296	0.037	GAP4
21	Satisfaction with the Overall Competence of Service Personnel (Expectation/Perception)	4.295	4.073	-0.222	GAP2
22	Satisfaction with the Overall Service Experience at the 4S Store (Expectation/Perception)	4.350	4.295	-0.055	GAP1
Composite Score for Quality Perception Gap (GAP1)				-0.1918	-
Composite Score for Service Standards Gap (GAP2)				-0.237	-
Composite Score for Service Delivery Gap (GAP3)				-0.13	-
Composite Score for Market Communication Gap (GAP4)				-0.15075	-
Composite Score for Perceived Service Quality Gap (GAP5)				-0.16	-
Composite Score for Overall Service Quality Gap (SQ)				-0.1665	-

3.3 Analysis of the Causes of Service Quality Gaps

3.3.1 Causes of the Quality Perception Gap (GAP1)

The Quality Perception Gap primarily stems from management's cognitive bias regarding customer expectations. This manifests in three specific ways: Lack of Systematic Customer Needs Research: Management lacks a structured mechanism for conducting customer demand research. There is no regular use of methods such as in-depth interviews or focus groups to understand core customer expectations. Instead, management relies on daily experience for judgment, leading to insufficient attention to customer needs such as "receiving caring services that exceed expectations" and "timely post-sales follow-up." Notably, the item "providing caring services that exceed expectations" shows the largest gap within this dimension at -0.368, representing its most significant shortfall. Ineffective Communication Between Management and Frontline Staff: Frontline staff, who have direct contact with customers and possess a wealth of demand information, lack effective channels to feedback this information to management. Consequently, customers' latent or unspoken needs fail to reach decision-makers.

Lagging Development of the Online Service Platform: Customer satisfaction with the online platform shows a gap of -0.100. The platform's functionality is limited, failing to meet customer needs for convenient inquiry, appointment booking, and feedback. This deficiency further widens the perception gap.

3.3.2 Causes of the Service Standards Gap (GAP2)

This gap represents the most significant among the five identified gaps. Its root causes are multifaceted: Unreasonable Service Standard Formulation: The established service standards are not adequately aligned with customer needs and the practical realities of the dealership. For instance, the standardized service processes lack the flexibility to accommodate diverse customer requirements, with 33.19% of surveyed customers expressing dissatisfaction specifically with the process rigidity. Insufficient Equipment Completeness: A discrepancy exists between customer expectations and the dealership's current hardware configuration, including maintenance/diagnostic tools and customer reception facilities. The item gap for this aspect is -0.281. Issues such as outdated equipment and suboptimal layout negatively impact service efficiency and the overall customer experience. Lack of Detailed Operational Protocols: The service standards remain at a macro level without being translated into specific, actionable operating procedures for different roles and service stages. This absence of granular guidelines leaves employees without clear execution benchmarks. Disconnection from Performance Evaluation: Service standards are not effectively integrated into employee performance assessment systems. This lack of linkage removes a key incentive for adherence, rendering the standards largely performative rather than operational.

3.3.3 Causes of the Service Delivery Gap (GAP3)

While the Service Delivery Gap is relatively smaller, it still presents specific areas for improvement. The primary causes are as follows: Insufficient Employee Professionalism: A significant gap exists in the "personnel professionalism" item (-0.318). Contributing factors include some technicians not having obtained the manufacturer's latest technical certifications, leading to a deficiency in their ability to service newer vehicle models. Additionally, sales consultants sometimes lack comprehensive knowledge of product details and financing policies. Need for Improved Service Attitude: The "staff service attitude" item shows a gap of -0.300. This indicates a weak service-oriented mindset among some employees, manifested as a lack of initiative and perfunctory responses to customer inquiries. Ineffective Control of Repair Processes: 32.27% of customers reported excessively long wait times for repairs. This issue is primarily attributed to inefficient scheduling of repair bays and insufficient spare parts inventory, both of which prolong the service cycle. Incomplete Service Progress Tracking Mechanism: Although the "service progress tracking" item shows a positive gap (+0.131), this practice is not consistently applied across all customers and does not cover the entire service journey comprehensively.

3.3.4 Causes of the Market Communication Gap (GAP4)

The Market Communication Gap arises from a disconnect between advertised promises and actual service delivery. The specific reasons are:

Marketing and promotional content frequently overpromises. To enhance product competitiveness, automotive manufacturers employ a variety of marketing tactics to accentuate product features. When customers purchase the promoted products, a discrepancy between elevated expectations and the actual experience can lead to psychological dissonance, significantly increasing the likelihood of complaints [5]. Similarly, dealership advertisements and promotional campaigns often emphasize "premium experience" and "personalized service," yet fail to deliver these consistently in practice. This misalignment is reflected in the finding that 35% of customers perceive a clear gap between advertised promises and the actual services received.

Insufficient Billing Transparency: A gap of -0.136 exists for customer satisfaction regarding the "reasonableness of repair charges and invoice transparency." Unclear pricing for certain service items and insufficiently detailed invoices undermine customer trust.

Absence of a Human-Centric Service System: 35% of customers reported a lack of personalized services. The dealership has not established differentiated service protocols tailored to different customer segments or varying needs, failing to translate its "personalized service" promise into actionable frameworks.

Poor Internal Communication and Coordination: Information silos exist between the sales and after-sales departments. Commitments made during the sales process often cannot be fulfilled in the after-sales stage due to a lack of shared information and aligned processes, thereby widening the communication gap.

3.3.5 Causes of the Perceived Service Quality Gap (GAP5)

This gap results from the cumulative effect of the preceding four gaps, with its core deficiencies centering on complaint handling and post-service care. The key contributing factors are:

Defective Complaint Handling Mechanism: The dealership lacks a clearly defined process for complaint reception, categorization, resolution, and feedback, with no established timelines for resolution. This leads to inefficient complaint management, reflected in a customer satisfaction gap of -0.413 for this item—the largest negative gap across all measured items.

Perfunctory Post-Service Follow-up: 35.45% of customers expressed dissatisfaction with follow-up care. The current practice is limited to basic post-service calls, failing to provide personalized follow-up tailored to individual customers—such as usage guidance after repairs or proactive maintenance reminders.

Inconsistent Repair Quality: 33.18% of customers reported unstable repair quality, with some issues requiring repeated rework. Although the specific item gap for "repair quality" is positive (+0.096), overall consistency remains an area for improvement, negatively impacting customers' holistic perception.

3.4 Service Quality Improvement Strategies Based on the 5GAP Model

Integrating the causal analysis of the five service quality gaps identified at the X 4S Store, and guided by the principles of "targeted intervention, systemic optimization, and actionable, verifiable measures," this section proposes a comprehensive service quality enhancement framework. The framework is designed to reduce each specific gap dimension, ultimately achieving precise alignment between customer-perceived service quality and their expectations.

3.4.1 Reducing the Quality Perception Gap (GAP1): Accurately Capturing Customer Needs and Establishing an Information Feedback Loop

To address the three primary causes—management's cognitive bias, disconnection between supply and demand information, and lagging online platforms—a full-chain demand management mechanism is proposed:

Strengthening Demand Research: Conduct monthly in-depth customer interviews (at least 30 participants per session) and quarterly focus group discussions, specifically targeting customers with strong expectations for "exceeding expectations with caring service" and "post-sales follow-up." Establish a dynamic customer expectations database to continuously update demand priorities and enable targeted responses to core needs.

Establishing an Information Feedback Channel: Appoint "Frontline Staff Demand Feedback Liaisons" to collect latent customer needs identified by employees on a weekly basis. Compile this information into a Weekly Demand Feedback Report for management review. Hold monthly cross-departmental communication meetings to ensure frontline insights are swiftly translated into service improvements.

Transition after-sales services to an online model to enhance information transparency and service efficiency [6]. The online service platform will be upgraded to incorporate intelligent appointment scheduling, real-time service progress tracking, and online feedback modules. The user interface will be optimized, and platform features will be iteratively improved each month based on customer feedback. This initiative addresses the platform's functional limitations and reduces the perceived gap in online service delivery.

3.4.2 Reducing the Service Standards Gap (GAP2): Optimizing the Standardization System and Strengthening Implementation

Addressing the four key causes—unreasonable standards, inadequate hardware, lack of detailed protocols, and disconnection from performance evaluation—requires a three-pronged approach focused on "formulation, resource allocation, and execution."

Optimizing Differentiated Service Standards: Leverage findings from customer needs research to refine service workflows for specific scenarios such as new car sales and maintenance/repair. Establish a fast-track service lane for priority customers, ensuring their process duration does not exceed 60% of the standard time, thereby enhancing process flexibility.

Improving Hardware Configuration: Update outdated maintenance and diagnostic equipment, introducing 2-3 units of the latest BMW-specific diagnostic instruments. Optimize the layout of equipment and augment customer reception areas with user-friendly amenities to reduce the perception gap regarding hardware completeness.

Developing Detailed Operational Protocols: Create a Service Standards Operations Manual tailored to each functional role, specifying operational procedures, timeframes, and quality requirements for every process step. This provides employees with clear execution guidelines. Link evaluation mechanisms to compensation. By aligning employee performance directly with remuneration, work motivation and output efficiency can be significantly enhanced [7]. Regular specialized audits should be conducted to prevent standards from becoming merely symbolic.

3.4.3 Reducing the Service Delivery Gap (GAP3): Enhancing Employee Competency and Optimizing Service Processes

To address the causes of insufficient employee professionalism, weak service attitude, ineffective process control, and incomplete progress tracking, a dual-focus system for optimizing both "people and processes" is proposed.

First, immersive virtual simulation training courses—either developed in-house to meet specific needs or adopted from mature market solutions—are implemented. Through a more practical and immersive learning platform, employees can effectively integrate theoretical knowledge with hands-on practice, thereby enhancing their overall competence [8].

Implement a Proactive Service Accountability System: Clearly define requirements for proactive staff engagement, including greetings, inquiry resolution, and service follow-up. Integrate customer feedback on staff attitude into performance evaluations.

Recognize and reward outstanding employees to incentivize improvement in service demeanor.

Optimize Repair Process Control: Introduce an intelligent service bay scheduling system to optimize resource allocation. Establish a safety-stock alert mechanism for critical spare parts to ensure inventory meets over 95% of routine repair demands, thereby reducing wait times. **Achieve Comprehensive Service Progress Tracking:** Utilize SMS and WeChat to provide real-time updates on repair status to all customers. This eliminates the limitation of selective tracking and ensures customers are fully informed throughout the service journey.

3.4.4 Reducing the Market Communication Gap (GAP4): Standardizing Promotional Claims and Strengthening Interdepartmental Coordination

Focusing on the four causes—exaggerated promises, opaque pricing, lack of human-centric services, and poor internal coordination—a transparent and collaborative communication system is established.

Standardizing Promotional Content: Implement a dual-approval mechanism for marketing materials. All promotional copy and activities developed by the marketing department must be reviewed and confirmed as actionable by the service department prior to release. Clearly define the specific content of "personalized service" and "premium experience" to prevent over-promising.

Enhancing Pricing Transparency: Develop a Service Charges & Details Handbook and publish the pricing standards both in-store and online. Provide customers with a detailed quotation before service commencement and furnish a comprehensive, itemized invoice with explanations after service completion to eliminate customer distrust.

Refine the Human-Centric Service System: Service offerings are not static; they must evolve in response to contemporary demands and shifting customer expectations to maintain their relevance and vitality [9]. To address the deficit in personalized service provision, differentiated service packages should be designed, tailored to the distinct needs and consumption levels of various customer segments.

Establishing Cross-Departmental Coordination Mechanisms: Hold monthly alignment meetings between the marketing and service departments to synchronize promotional plans with service capabilities. Proactively allocate resources (staff, service bays, spare parts) in anticipation of promotional periods to ensure seamless fulfillment of sales commitments in the after-sales phase.

3.4.5 Reducing the Perceived Service Quality Gap (GAP5): Perfecting Closed-Loop Management and Enhancing the Holistic Experience

Addressing the three core causes—ineffective complaint handling, superficial post-service care, and inconsistent quality—and building upon the improvements for the first four gaps, a comprehensive enhancement mechanism is proposed.

Implement a Robust Closed-Loop Complaint Handling System: A dedicated complaint handling department staffed with 2-3 full-time personnel is established. A structured protocol is adopted for general issues: "24-hour reception, 48-hour follow-up, 72-hour resolution, and 7-day satisfaction follow-up." A tiered complaint management process is developed, escalating major issues to management for coordination. Mandatory post-resolution satisfaction surveys ensure accountability and eliminate inefficient handling.

Optimize Personalized Post-Service Care: Increase the timely execution rate of post-sales follow-ups to over 95%. Design differentiated follow-up content for maintenance/repair customers versus new car purchasers, incorporating elements such as post-repair usage guidance and maintenance reminders. Offer regular free vehicle inspections and driving technique workshops for loyal customers to ensure care services are substantive.

Strengthen Repair Quality Assurance: Institute a "dual-verification" system where completed repairs are inspected and signed off by both the technician and a quality specialist. Extend the warranty period for critical repair items. Provide complimentary on-site re-inspection services. Prioritize and cover costs for repeat repairs of the same fault to improve repair quality consistency.



4. Conclusion

This paper takes Chengdu X 4S Store, a luxury automobile brand dealership, as a research case. By integrating the 5GAP and SERVQUAL models and employing questionnaire surveys and quantitative analysis, it systematically investigates service quality gaps and potential improvement pathways within the luxury automotive 4S store context. The key findings are summarized as follows.

The overall service quality gap for the store is calculated at -0.1665, indicating that customer perceptions fall below their expectations. Among the five major gaps, the Service Standards Gap (GAP2, -0.237) is the most significant, while the Service Delivery Gap (GAP3, -0.13) is relatively the smallest. Critical deficiencies identified include complaint handling and staff professionalism.

Based on the causal analysis of these gaps, this study constructs a "Five-Dimensional Targeted Improvement System" designed to effectively address the existing problems. This system aims to precisely narrow each gap through measures including accurate customer needs capture, optimized service standards, enhanced employee competency, standardized communication and coordination, and perfected closed-loop management. It provides the dealership with an actionable framework for optimizing service processes and improving customer satisfaction.

Theoretically, this research establishes an integrated "Dual-Model Framework – Quantitative Diagnosis – Targeted Intervention" methodology. This approach overcomes the limitations of applying a single model, validates the applicability of the 5GAP model in the luxury 4S store setting, and enriches the theoretical assessment toolkit for service quality in the automotive aftermarket.

Practically, the findings offer a valuable reference for similar luxury brand 4S stores, aiding the industry in addressing challenges such as homogenized competition and rising customer expectations.

The study acknowledges certain limitations. The sample is confined to a single dealership, limiting geographical and brand coverage, thus the generalizability of the conclusions requires further validation. Furthermore, the research did not delve deeply into the nuanced demand differences across diverse customer segments, suggesting that the proposed strategies could benefit from enhanced targeting.

Future research could expand the sample to include multi-brand and multi-region 4S stores. Integrating big data analytics to build intelligent service management systems, refining stratified and differentiated strategies, and developing long-term service quality enhancement mechanisms present promising avenues for further investigation.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, author-ship, and/or publication of this article.

Data Sharing Agreement

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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