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Optimizing Automobile Maintenance: Enhancing Customer Satisfaction through Efficient Service Layout and Time Management at Maruti Service Center, Bhopal

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Abstract

The Indian automobile industry ranks among the largest globally, contributing 7.1% to the country's Gross Domestic Product (GDP). India is also a significant exporter of automobiles, with strong prospects for export growth. Customer satisfaction plays a pivotal role in determining the rise or decline in the number of customers, especially in today's highly competitive market. This study focuses on enhancing automobile maintenance through Nanolubricants, enhanced with nanoparticles, have gained significant attention due to their potential to improve lubrication performance and thermal stability. This study investigates the sedimentation behavior of Al_2O_3, CuO, and SiO_2 nanoparticles in Nanolubricants through a pictorial analysis, providing crucial insights into their dispersion stability over time. The experimental results indicate that Al_2O_3 nanoparticles, at a concentration of 0.05 wt.%, begin to settle around the 12th day after formulation. In contrast, CuO and SiO_2 nanoparticles exhibit superior stability, with initial sedimentation occurring around the 28th day for the same concentration. Additionally, the study reveals that increasing nanoparticle concentration accelerates the sedimentation process, thereby reducing the overall stability of the Nanolubricants. These findings contribute to a better understanding of nanoparticle interactions within lubricant formulations, aiding in the development of more stable and effective Nanolubricants for various industrial applications.

Keywords: Automobile, quality, customer satisfaction, cost, time.

1. Introduction

In today's highly competitive world, customer service has become a critical business function that drivesgrowth, development, profitability, and customer loyalty. It not only influences a company's competitive advantage but also creates opportunities for profitability and enhances product quality through economies of scale and increased revenue. Consequently, both developed and developing nations are increasingly recognizing the pivotal role of the service sector. Service providers are now focused on delivering superior service quality to enhance customer satisfaction and foster loyalty.

Kumar and Tour (2003) highlight the diverse responsibilities of the service sector, which include logistics, spare parts management, documentation, startup support, improved product offerings, insurance, warranty services, call centers, training, and maintenance and repair. Calif (1987) defines maintenance as tasks such as replacing, cleaning, installing, and restarting faulty components. Khasker et al. (2011) further emphasize the evolving scope of motor vehicle services, which now include leasing, training, data management, fault detection, and rectification at no cost to the customer, as noted by Kruse et al. (2010).

Within the motor vehicle industry, maintenance and repair services are indispensable for ensuring product reliability and customer satisfaction. However, despite the significant emphasis on service quality, customers often lack the expertise and knowledge required to engage effectively with service providers. This disadvantage limits their bargaining power and exposes them to potential exploitation. Many researchers argue that customers' limited understanding of industry-specific practices leaves them vulnerable to misinformation, overcharges, and poor service quality.

2. Methodology

This research was conducted at the Maruti Service Center in Bhopal, focusing on evaluating and improving customer satisfaction and service efficiency. Various processes carried out within the service center were documented and visualized through process flow diagrams.

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To gauge customer satisfaction, a survey was administered using a 5-point Likert scale, where 1 indicated "Strongly Dissatisfied" and 5 represented "Strongly Satisfied." The collected data was systematically analyzed to identify key areas for improvement and implement actionable solutions aimed at enhancing the overall service experience.

Figure 1. (a) Workshop, (b) Car checking, (c) Inside Workshop

The primary goal of this study was to identify strategies to reduce labor costs, a significant expense on any organization's balance sheet. Achieving an effective cost reduction requires striking a balance between resource allocation and cost management. Various practical and innovative methods were explored to optimize labor expenses while maintaining organizational value.

Key strategies included enhancing workplace safety, providing comprehensive employee training, minimizing turnover rates, and boosting overall productivity. Additionally, a revised workshop layout was proposed to streamline operations. This layout featured lobby executives to assist customers, an underbody inspection system for more efficient vehicle checks, and the integration of spare parts and machine shops within the service center to eliminate unnecessary time delays.

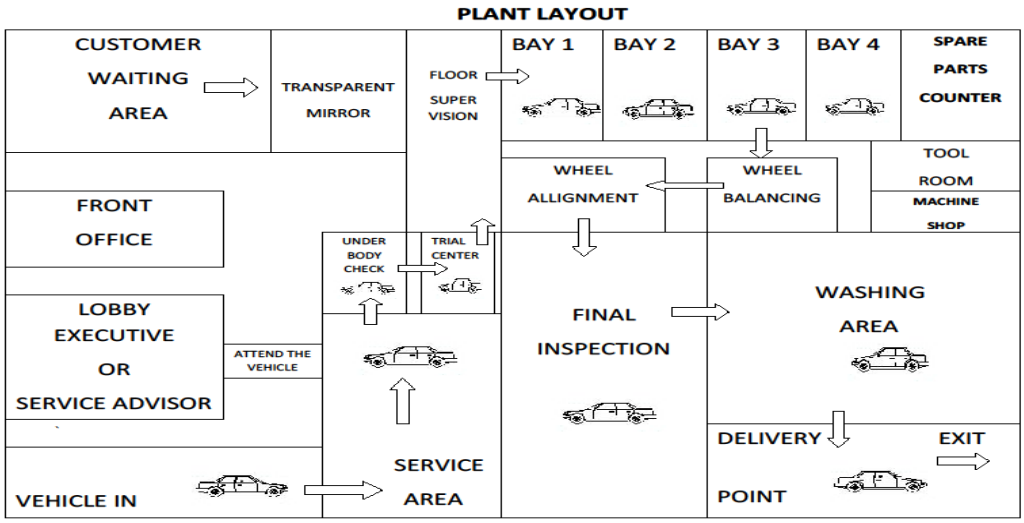

Figure 2. Work shop layout plan

The new service center layout introduces several enhancements aimed at improving operational efficiency and customer satisfaction. A lobby executive has been added to assist customers promptly, ensuring a seamless service experience. An underbody inspection system has also been incorporated into the layout, addressing a previously absent feature in the service center.

Additionally, the spare parts shop and machine shop have been integrated into the service center itself. This strategic placement eliminates unnecessary delays caused by retrieving parts or equipment from external locations, significantly improving time management and overall workflow efficiency. These modifications collectively streamline operations, reduce service time, and enhance the customer experience.

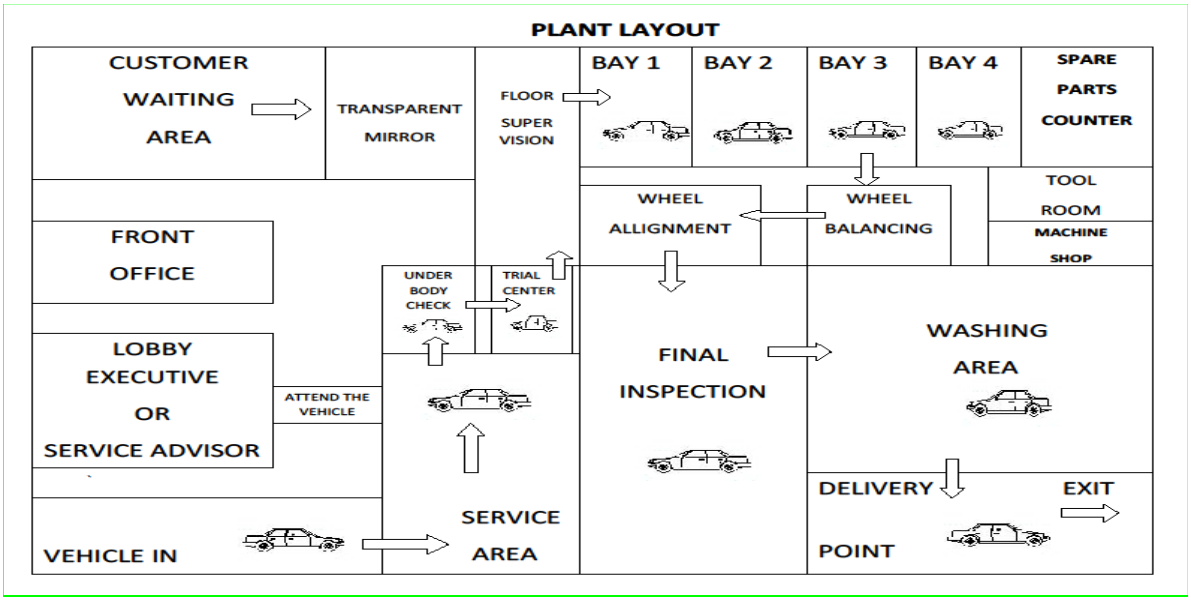

Figure 3. Workshop layout plan

Figure 3 illustrates the updated workshop layout designed to enhance efficiency and customer experience. Key improvements include the addition of lobby executives to provide prompt assistance to customers and an underbody inspection system integrated into the service process. Furthermore, spare parts and machine shops have been

strategically positioned within the service center to eliminate time wastage associated with external retrievals. These enhancements collectively contribute to a more streamlined workflow and improved time management.

3. Company Layout Plan and Customer Satisfaction in the Automotive Industry

The existing company layout reveals significant inefficiencies in its operations. Currently, there is no lobby executive to attend to clients, nor is there an underbody inspection system for vehicles. Additionally, the absence of spare parts and machine shops within the service center creates logistical challenges. Mechanics must leave the facility to procure required parts from an external storage facility, resulting in considerable time wastage and delays in service delivery.

Addressing these inefficiencies aligns with the broader objective of enhancing customer satisfaction. In the automotive industry, innovation has always been a driving force, shaping the development of today's advanced vehicles. However, modern automotive companies are now looking beyond vehicle performance to improve customer experience and foster brand loyalty. Key innovations are transforming how customers interact with automotive services, ensuring they return for future purchases and services.

Customer satisfaction in this context is defined as the proportion of customers who utilize the service center, experience its quality, and leave feeling satisfied or happy with the service provided. Achieving high levels of customer satisfaction not only enhances the reputation of the service center but also strengthens customer loyalty, driving long-term business success.

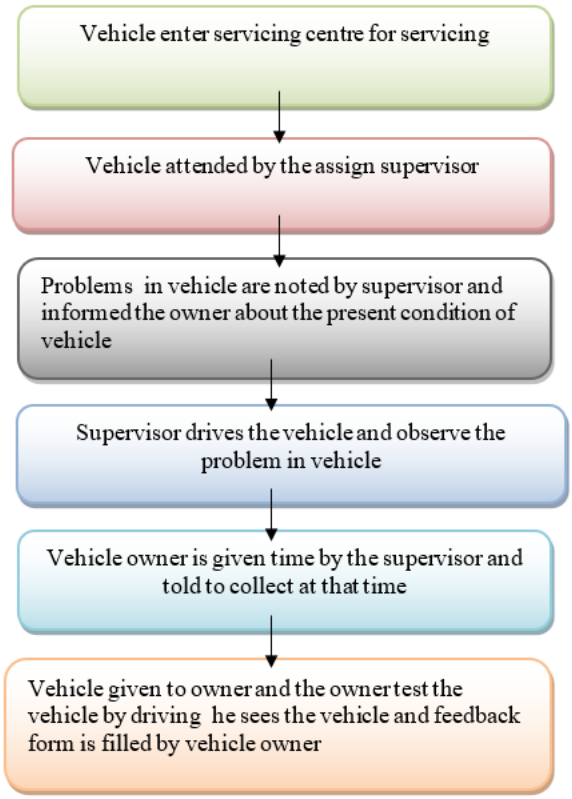

Figure 4. Flow chart of Methodology

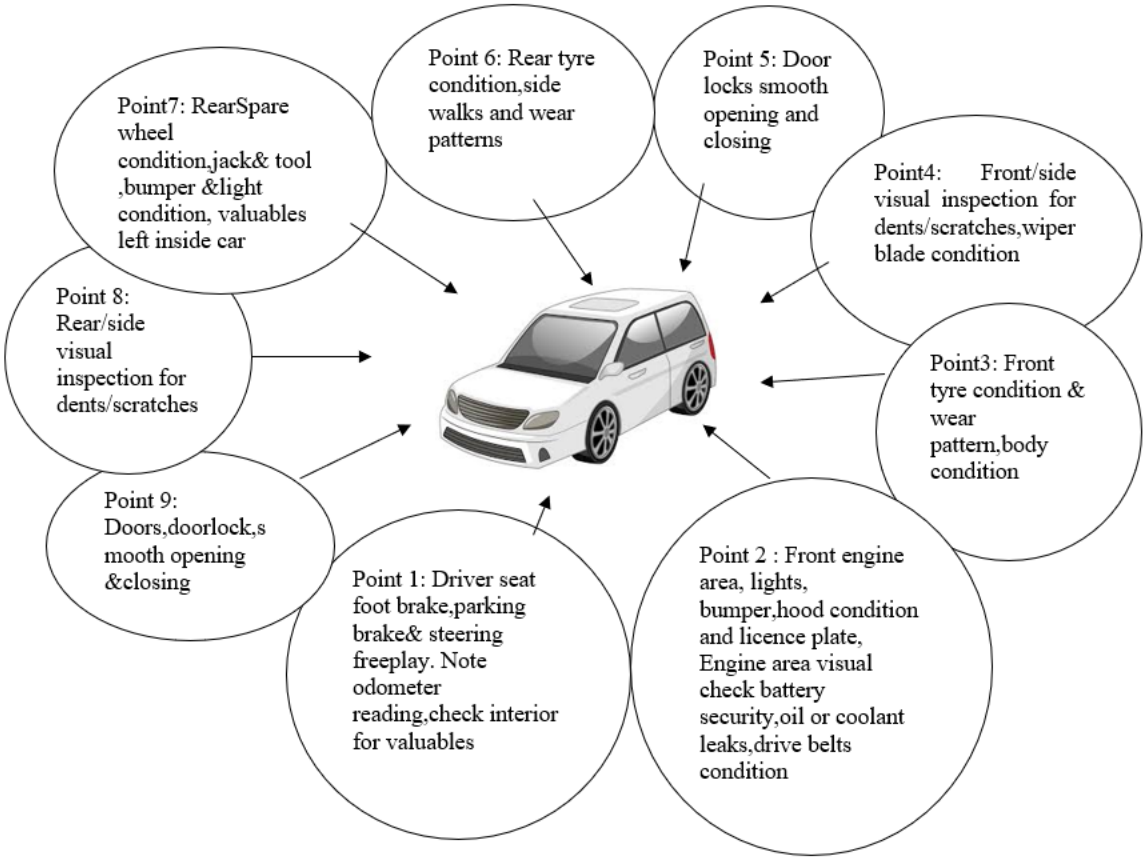

Figure 5. Flow Chart of Points to be considered in maintenance

4. Results

Time management emerged as the central focus of this study, with the objectives achieved through the implementation of an optimized vehicle tracking sheet and a redesigned service center layout plan. The tracking sheet demonstrated significant improvements in time efficiency across all stages of vehicle servicing, including first, second, and third services.

Key time reductions were achieved as follows:

- The service advisor conducted a vehicle trial within 2 minutes of receiving the vehicle.
- Job card creation was streamlined to be completed within 8 minutes.
- The overall servicing time for a vehicle was reduced to 90 minutes (1 hour 30 minutes), while paid services were completed in 2 to 2.5 hours.

In the new layout plan, the addition of lobby executives ensured prompt customer assistance, while an underbody inspection system was introduced to enhance service quality. The integration of spare parts and machine shops within the service center further eliminated unnecessary delays, optimizing time management throughout the process.
In contrast, the previous layout lacked a lobby executive, resulting in inefficient time utilization. For instance, job card opening previously took 20–30 minutes, and vehicle delivery required up to 3 hours due to inadequate supervision. The new layout effectively addressed these inefficiencies, leading to enhanced operational flow and reduced service time. Customer feedback indicated a high level of satisfaction, with the overall satisfaction index reflecting a marked improvement.

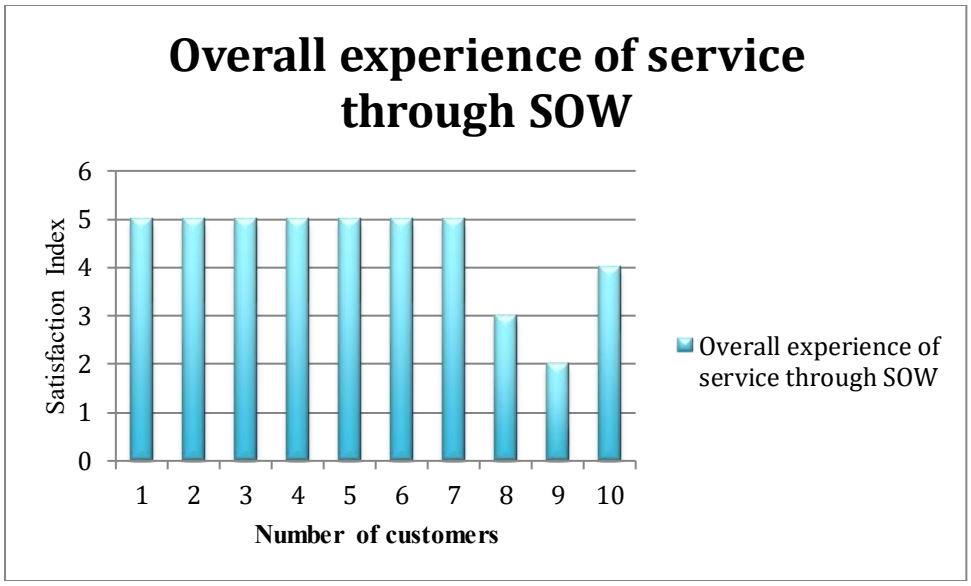

Figure 6. Shows overall experience at service through SOW

Figure 6 explains about the overall experience of service through SOW. Out of 10 customers 7 customers have rated as 5 and others have rating as 4 ,3, and 2.

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