Vehicle Repair Data Analysis – Summary

(Detailed Report)

1. **Column Breakdown:**

   o **Identifiers:** VIN, TRANSACTION_ID, and Causal Part Name help track repairs and parts.

   o **Repair Insights:** Repair Date, Global Labor Code, and Total Cost show repair patterns and cost details.

   o **Geographic & Dealer Info:** Dealer Name, City, and Region help analyze dealer performance and regional trends.

   o **Customer Feedback:** Complaints and vehicle details help find common issues and repair trends.

2. **Data Cleaning:**

   o **Missing Data:** Filled in missing KM values with the average and added "Unknown" for missing categories.

   o **Inconsistencies:** Made dealer names and part names consistent.

   o **Outliers:** Fixed extreme values in Total Cost and KM for better accuracy.

3. **Visual Insights:**

   o **Cost by Part:** Shows which parts, like steering wheels, are expensive, suggesting areas for improvement.

   o **Cost by Dealer:** Identifies dealers with high repair costs, highlighting the need for performance monitoring.

   o **Cost Over Time:** Tracks how repair costs change over time, helping identify seasonal patterns.

   o **Repair Age vs. Cost:** Older vehicles tend to have higher repair costs.

   o **Complaint Distribution:** Highlights common customer complaints, helping guide vehicle improvements.

4. **Generated Tags & Key Insights:**

   o **Tags:**

      ▪ **Failure Conditions:** Words like "malfunction," "faulty," and "broken" point to common vehicle issues.

      ▪ **Components:** Parts like "steering wheel," "module," and "motor control" often fail.

      ▪ **Actions Taken:** Terms like "replaced," "reprogrammed," and "tested" summarize the repair actions, helping measure efficiency.

   o **Key Insights:**

      ▪ **Frequent Issues:** Steering wheels, modules, and electronics are often the problem, so improving these parts can help.

      ▪ **Cost Drivers:** Expensive parts like steering wheels and motor control modules increase repair costs. Bulk buying or redesigning could lower costs.

      ▪ **Dealer Performance:** Dealers with higher repair costs should be reviewed to improve service consistency.

      ▪ **Product Improvement:** Focusing on improving parts that fail often can boost vehicle quality and customer satisfaction.

5. **Actionable Recommendations:**

   o **Improve Part Durability**: Focus on parts like steering wheels and modules to reduce frequent failures and repair costs.
   o **Monitor Dealers:** Review high-cost dealers to improve service efficiency.
   o **Optimize Procurement:** Bulk purchase or redesign expensive parts to cut costs.
   o **Address Common Issues:** Resolve frequent customer complaints to improve vehicle reliability.
   o **Enhance Repair Efficiency:** Streamline repair processes to reduce unnecessary costs.

Conclusion:

This analysis highlights key repair trends, part failures, and dealer performance. By addressing data inconsistencies and focusing on high-cost parts and dealer inefficiencies, stakeholders can improve vehicle quality and reduce repair costs. Key recommendations include improving part durability, monitoring high-cost dealers, optimizing procurement, addressing common issues, and enhancing repair efficiency. Implementing these steps will drive cost reductions, improve quality, and increase customer satisfaction.