

# Forecasting Methods for Intermittent Spare Parts Demand in the Automotive Assembly Industry: A Comparative Case Study

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**Abstract.** Spare parts demand forecasting in the automotive industry faces challenges due to high demand variability and intermittent consumption patterns. These factors directly impact inventory levels, often resulting in either overstocking or stockouts, which in turn affect assembly line performance and customer satisfaction. Accurate forecasting helps avoid overstocking, reduce lead times, and ensure service continuity. However, selecting an appropriate forecasting method for such complex demand patterns remains a challenge. In this paper, we present a comparative study of three forecasting techniques: ARIMA, Exponential Smoothing, and Croston's method, selected for their suitability in managing irregular and lumpy demand patterns. The evaluation is based on real-world data from a local automotive maintenance department and utilizes three statistical accuracy metrics: Mean Squared Error (MSE), Mean Absolute Deviation (MAD), and Weighted Absolute Percentage Error (WAPE). Our results reveal that no single method consistently outperforms the others across all parts, highlighting the importance of tailoring the forecasting approach to the specific demand characteristics of each item. Ultimately, this study offers practical insights for decision-makers aiming to enhance planning strategies and strengthen resilience in the automotive industry.

**Keywords:** Spare Parts Forecasting, Intermittent Demand, Automotive Industry, ARIMA, Croston's Method, Exponential Smoothing.