**Forecasting Hotel Demand using Machine Learning Approaches**

**Abstract**

A critical aspect of revenue management is a firm's ability to predict future demand. Historically, hotels use pick-up based models to conduct forecasts. This study appears to be the first study in academia applying machine learning in hotel demand forecast. The empirical findings find that Support Vector Machine, a popular machine learning method, outperforms traditional models in hotel demand forecast. The proposed models are valuable for practitioners in improving forecast accuracy and optimizing revenue, and lay the groundwork for future research into refining machine learning models in hotel revenue management.

1. Introduction

Accurate forecast of demand is an essential component in hotel revenue management. Historically, hotel managers use pick-up based models, which estimate the increments of future reservations and aggregate the increments as part of final arrivals. The name "pick-up" is derived from the action that some new reservations will be "picked up" from the current reservations on hand (ROH)