

**MULTIVARIATE SALES FORECASTING OF MODULAR
FURNITURE OF ABC COMPANY USING ADVANCED
MACHINE LEARNING TECHNIQUES**

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Abstract

Retail Modular furniture business segment of ABC Company has been experiencing excess stock, out of stock, material shortages, production inefficiencies which are typical supply chain issues mainly caused by inadequate accuracy level of forecasting. Current forecasting models of Modular furniture sales is dominated by traditional statistical methods like ARIMA combined with judgmental techniques. In this research, to improve the existing forecasting methods of ABC Company, advanced ML techniques-based forecasting models are developed, which can consume external variables. In addition to the sales quantity of historical time steps, macro environment variables and marketing mix variables which influence sales are considered as external variables. As potential advanced ML techniques, ANN, DNN, Vanilla LSTM and Stacked LSTM are used to develop forecasting models. Out of those four models, for each furniture product, best model is selected by comparing performances based on MSE and MAE which are two popular error metrics in advanced ML space. As sample of Modular furniture, six top selling wardrobes are subjected to development of new forecasting models. Those selected advanced ML techniques respond differently based on the product type but each of them performed better than ARIMA model which is taken as the industry benchmark. Finally, advanced ML techniques-based forecasting models which consume external variables are recommended to ABC Company to carry out future forecasting of the retail Modular furniture sales as it may help to smoothen the supply chain operations.