Supply Chain Intelligence: Deep Learning for Demand Forecasting and Inventory Management

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Abstract: *This study aims to transform supply chain management in production engineering by integrating advanced deep learning techniques, particularly recurrent neural networks (RNNs) and attention mechanisms. It focuses on improving demand forecasting accuracy and optimizing inventory management. Using diverse historical data, the research develops and validates sophisticated deep learning models, comparing them with traditional methods to demonstrate their superiority. Special attention is given to ensuring the interpretability of these models through attention mechanisms, enhancing understanding of decision-making processes. The research emphasizes practical implementation, iteratively refining models to ensure they are applicable and effective in real-world situations. Overall, the findings advance supply chain intelligence and enhance production engineering efficiency and adaptability significantly*