Predictive Analysis for Supply Chain Management Using Extreme Gradient Boost Classifier

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Abstract: *A novel approach to predictive analysis and demand forecasting within supply chain management, employing the Extreme Gradient Boosting (XGBoost) classifier. In response to the escalating complexity and volatility of supply chains, accurate demand forecasting is imperative for optimizing inventory, production scheduling, and overall operational efficiency. Traditional forecasting methods often struggle to capture the nonlinear relationships and intricate patterns inherent in supply chain data. Conversely, XGBoost offers a potent machine learning technique adept at handling nonlinear relationships and delivering robust predictions. The proposed framework involves data preprocessing, feature engineering, model training, and validation stages. Through a case study employing real-world supply chain data, we demonstrate the superior performance of the XGBoost classifier over traditional methods in terms of accuracy, robustness, and scalability. This study underscores XGBoost's potential as a valuable tool for demand forecasting in supply chain management, facilitating informed decision-making, optimized inventory management, cost reduction, and enhanced customer satisfaction. Furthermore, the framework's adaptability and extendibility make it applicable to diverse industries and domains, contributing to the advancement of supply chain management through the integration of machine learning techniques for more precise and efficient demand forecasting.*

Keywords: Supply Chain Management, Predictive Analysis, XGBoost Classifier.

REFERENCES

[1]. R. W. Ahmad, K. Salah, R. Jayaraman, I. Yaqoob, M. Omar and S. Ellahham, "Blockchain-Based Forward Supply Chain and Waste Management for COVID-19 Medical Equipment and Supplies".

[2]. K. M. K. Raghunath, V. V. Kumar, M. Venkatesan, K. K. Singh, T. R. Mahesh and A. Singh, "XGBoost Regression Classifier (XRC) Model for Cyber Attack Detection and Classification Using Inception V4," in Journal of Web Engineering.

[3]. A. Bouchaala, L. Courau, O. Bonnaud and P. Galy, "Efficient method for predictive modeling of irregular shaped Power Distribution Network," 2015 International Conference on Electronics Packaging and iMAPS All Asia Conference.

[4]. D. H. Nguyen, X. Hien Le, J. -Y. Heo and D. -H. Bae, "Development of an Extreme Gradient Boosting Model Integrated With Evolutionary Algorithms for Hourly Water Level Prediction".

[5]. P. S and P. D. S, "A Hybrid Demand Forecasting for Intermittent Demand Patterns using Machine Learning Techniques," 2022 1st International Conference on Computational Science and Technology (ICCST), CHENNAI, India.

[6]. M. Farrokhabadi, J. Browell, Y. Wang, S. Makonin, W. Su and H. Zareipour, "Day-Ahead Electricity Demand Forecasting Competition: Post-COVID Paradigm," in IEEE Open Access Journal of Power and Energy.

[7]. N. Zhang, K. Kang, F. Zhang and Q. Feng, "Risk Warning and Prevention of Supply Chain in Automobile Industry Based on Data Mining Technology," 2022 International Conference on Industrial IoT, Big Data and Supply Chain.

[8]. D. N. Nya and H. Abouaïssa, "An Efficient Framework for Tactical Management in Supply Chain Systems," 2022 14th International Colloquium of Logistics and Supply Chain Management (LOGISTIQUA), EL JADIDA, Morocco.

[9]. X. Chen, Y. Wu and X. He, "Long Short-Term Memory Network PV Power Prediction Incorporating Extreme Extreme Gradient Boosting Algorithm," 2022 12th International Conference on Power and Energy Systems (ICPES).

[10]. A. -R. Kim, D. Park, C. -S. Lee and H. Chang, "A Comparative Analysis of Time Series Forecasting Methods for Short-Term Electricity Demand Prediction," 2023 14th International Conference on Information and Communication Technology Convergence (ICTC).

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