SUPPLY CHAIN 4.0 AND MACHINE LEARNING

The world is now experiencing Industry 4.0, the fourth industrial revolution. The industrial revolution began in the early years of this millennium with autonomous production using cyber-physical systems (CPS), cloud computing, Internet of things (IoT), Internet of services (IoS), and augmented reality. Industry 4.0 has had a revolutionary impact on supply chain management. In the environment of Industry 4.0, suppliers are intelligent, factories are smart, products are smart, and customers demand all-around greater satisfaction from services. Machine learning makes it possible to discover patterns in supply chain 4.0 data by relying on algorithms that quickly pinpoint the most influential factors to a supply networks' success, while constantly learning in the process. Supply Chain 4.0 refers to the supply chain operating in the environment of Industry 4.0, which is designed, planned, managed, and optimized using Industry 4.0 (Machine Learning) technologies to maximize customer satisfaction with minimal operational cost and minimal environmental impact. The distinguishing attributes of Supply Chain 4.0 and Machine Learning include visibility, connectivity, coordination, synchronization, autonomy, resilience, sustainability, and optimality. Discovering new patterns in supply chain 4.0 data has the potential to revolutionize any business. Machine learning algorithms are finding these new patterns in supply chain data daily, without needing manual intervention or the definition of taxonomy to guide the analysis. The algorithms iteratively query data with many using constraint-based modeling to find the core set of factors with the greatest predictive accuracy. New knowledge and insights from machine learning are revolutionizing Supply Chain 4.0 as a result.

The ten ways Machine Learning is revolutionizing Supply Chain 4.0 include:

- Demand forecasting accuracy through Machine Learning
- Combing Machine Learning with advanced analytics
- Machine Learning improves production planning and production scheduling accuracy
- Machine Learning improves supplier quality management
- Machine Learning extends the life of key supply chain assets
- Demand forecasts accurately for new product with causal factors
- Gaining greater contextual intelligence using Machine Learning
- Machine Learning excels as visual pattern recognition in entire Supply Chain Network
- Machine Learning and optimum Collaborative Supply Chain Network
- Machine Learning improves Supply Chain Management performance

This Invited Track Session of the 10th IFAC Conference on Manufacturing Modelling, Management and Control – MIM 2022 for accomplishments and contributions from academia and industry to address Supply Chain 4.0 and Machine Learning issues and challenges.

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