Introduction to the Minitrack “Intelligent Decision Support for Logistics and Supply Chain Management”

Julia Pahl
University of Southern Denmark
julp@iti.sdu.dk

Stefan Voß
University of Hamburg
stefan.voss@uni-hamburg.de

Abstract

Using data and related analytics tools to provide valuable decision support can be seen under the umbrella of the digital transformation wave that is incessantly continuing its path and expected to grow in the years to come. Implications for companies are certainly to prepare their information and communication technology (ICT) infrastructure and workforce for the opportunities and new challenges regarding data-driven decision making and analytics tools. Application areas are as wide as one can imagine and the “gold nuggets” of knowledge awaiting to be lifted, as said every once in a while by data mining experts.

Advances in ICT have enabled a plethora of automation efforts to take place. Based on these, the digital transformation seems accelerating its pace further pushing the digital supply chain. However, we are also reminded of how fragile our supply chains and their logistics infrastructure are not only in the face of the global pandemic caused by Covid-19.

This year’s contributions span a variety of methodologies and aspects of logistics and supply chain management (SCM) and provide an insightful picture of where the trend is going. We present them in alphabetical order of the authors.

Blossey, Hahn, and Koberstein [1] deal with how to manage uncertainty in pharmaceutical supply chains and present a structured review emphasizing quantitative models that can incorporate uncertainties and risks in a complex and fragmented supply chain. They show that proposed mathematical models lack important aspects of the business environment and propose future research directions for more resilient and responsive supply chains.

Kiefer, Grimm, Bauer, and van Dinther [2] deal with demand forecasting intermittent and lumpy time series by comparing statistical, machine learning and

deep learning methods. Their focus is on accuracy metrics used to evaluate the forecast. They propose a new metric named the Stock-keeping-oriented Prediction Error Costs (SPEC) that eliminates drawbacks of traditional metrics and take horizontal and vertical shifts over the forecasting horizon into account.

Lee, Mazur, Bittner, and Schoder [3] propose an intelligent decision-support system for air cargo palletizing that helps the planners to optimize the utilization of the loading weight and/or the maximum use of cargo space. This problem is very complex with a significant number of constraints that is often dealt with manually leading to suboptimal results.

Seo and Thorson [4] deal with computable approaches to rational choice and decision-making and investigate axiomatic theories of rational choices focussing on their computability. They use algorithmic complexity to show highly general conditions under which no procedure exists that enables these theories to identify sequences of choices as random.

References

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