

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

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### Abstract

*Data-driven analytical tools used to provide valuable decision support are continuing their success stories within the digital transformation wave that is swashing into every niche awaiting to be discovered and lifted as the “gold nugget” of knowledge as once upon a time named by data mining experts. Accordingly, application areas are vastly ranging from air cargo management through manufacturing and demand forecasting to maritime maintenance as presented in our minitrack.*

Advances in *information and communication technology* (ICT) have enabled a plethora of automation efforts to take place. Based on these, the digital transformation seems accelerating its pace towards the digital supply chain.

Sensor networks, social network activities, retail transactions, website/online shop search histories, etc. are just a few examples of sources to provide data to support efficient decision analytics. Big data issues are well recognized to offer long-awaited opportunities, but also challenging data handling and decision analytics. This year’s contributions span various 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 order of the scheduled presentations at the HICSS-56 conference.

### 1. Supporting Your Basic Needs - A Base Support Approach for Static Stability Assessments in Air Cargo.

Diego Enrico Longhitano, Philipp Gabriel Mazur, Simon Maximilian Wolf, and Detlef Schoder investigate base-related stability approaches to irregular and heterogenous air cargo pallets within static stability assessments. The authors follow a design science research approach to develop and

conduct their analysis. Requirements regarding artifacts are defined containing complex, multi-level shapes.

### 2. Online Collective Demand Forecasting for Bike Sharing Service

The paper of Charles Dickens, Alexander Miller, Lise Getoor deals with time-series forecasting extending classical seasonal autoregressive models to include exogenous and relational information in an online-setting used on bike sharing systems. The authors use probabilistic soft logic as a programming language. They further propose new modelling patterns to capture dependencies between time series.

### 3. Digital Twins for Internal Transport Systems: Use Cases, Functions, and System Architecture

Minja Marinkovic, Stefan Galka, Sebastian Meißner propose a reference architecture for a digital twin for internal transport systems in manufacturing. The authors define use cases and standards for a digital twin for in-plant transportation systems and define standard functions required for resource planning and process control of these systems.

### 4. Towards Just-In-Time Arrival for Container Ships by the Integration of Prediction Models

Finally, Jingjing Yu, Stefan Voß propose a two-stage integrating prediction of ship arrival times together with the berth allocation and quay crane assignment problem further considering vessel speed optimization. They show that random forest performs best for the first stage of the model which is input to the second stage resulting into a reduction of service delays, fuel consumption, and vessel emissions.