

PLM INDUSTRY TALK



INVITATION

E2E Supply Chain Optimization at Amazon **Sami ÖZARIK**

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Abstract: The objective of the Supply Chain Plan optimization project is to define an end-to-end (E2E) speed- and cost-optimal Sales and Operations Plan (S&OP) under the network constraints. We take forward-looking planning and design decisions, working backwards from ZIP2 level customer demand forecast, using forward looking transportation connectivity. We optimize for speed and cost, rather than basing planning decisions on past executions, plans and settings. The optimization model is a modular algorithm which combines Operations Research (OR) and Machine Learning (ML) techniques. Overall, the model iteratively solves two optimization problems for inbound (IB) and outbound (OB) decisions in order to converge to an E2E optimal S&OP. The model optimizes IB decisions to achieve an ideal inventory picture (in terms of both selection and depth) that aims to reduce the distance to the forecasted customer demand and increase local in stock. Based on the new predicted inventory picture and demand, the model re-optimizes the OB solutions in order to simulate the fulfilment network with the new inventory picture. To this end, the model maximizes speed and minimizes total cost while respecting laws of physics constraints such as maximum machine capacity of each node or network connectivity.

About the speaker: Sami Serkan Özarık holds an MSc in Industrial Engineering from Middle East Technical University (METU) and a PhD from TU Eindhoven. He studied abroad at TU Delft, worked part-time at Henkel as a Supply Chain Engineer and at ASELSAN Research Center as a Project Evaluation and Analysis Engineer. During his PhD, Sami focused on data-driven logistics and vehicle routing problems in e-commerce, under the guidance of Dr. Virginie Lurkin, Dr. Luuk Veelenturf, and Prof. Dr. Tom van Woensel. He also collaborated closely with Prof. Dr. Gilbert Laporte from HEC Montréal. In 2021, Sami joined Amazon in Luxembourg as an Operations Research Scientist and currently leads the EU Supply Chain Flow Planning Optimization team.

