

Preparing for the Unpredictable: Future-Proofing Supply Chains Through Simulation

BY OLLE SANDELL FERRADA & EDVIN GADELI (2026)

Imagine trying to predict the ripple effects of moving a major manufacturing supplier from Europe to Asia. In today's global industry, supply chains face unprecedented uncertainties - from shifting markets to sudden logistical bottlenecks.

Traditional, static planning tools, like spreadsheets, heavily struggle to capture the dynamic and interconnected nature of these modern networks. As a result, strategic sourcing decisions often lead to unforeseen operational costs and delayed activities. To stay competitive, companies need the ability to test "what-if" scenarios *before* making real-world changes. This is where computer simulation becomes invaluable.

However, you cannot simply plug a complex logistics network into a simulation software and expect instant answers. Our master thesis, conducted at Scania's Regional Material Control Nordic, investigated what is actually required for a large organization to enable simulation-based decision support. Instead of just building a model, we focused on the foundational question: is the organization technically and organizationally ready?

Through interviews and data analysis, we found that simulation readiness is far more than an IT challenge. It is an organizational capability. We identified key barriers preventing Scania from effectively simulating their network today.

These include fragmented information flows between departments - such as Procurement and Logistics - along with data quality issues and a lack of cross-functional alignment. Often, strategic decisions are made without a clear picture of their downstream operational consequences, leading to hidden costs that are absorbed later in the chain.

To address these gaps, we developed a comprehensive simulation framework tailored for Scania. We mapped out exactly what data is missing - such as precise processing speeds and transport capacities - and created a simplified conceptual model of the network. Furthermore, we designed a five-phase implementation roadmap. This step-by-step guide bridges the gap between current fragmented practices and a future state where simulation is an integrated tool.

By following this roadmap, organizations can break down internal silos and transition from reactive firefighting to proactive planning. In the long run, establishing this simulation foundation will allow companies to accurately predict lead times, reduce CO2 emissions and minimize total logistics costs before a single physical truck hits the road.

This popularized summary is derived from the master thesis: "BUILDING THE FOUNDATION FOR SIMULATION-BASED SUPPLY CHAIN DESIGN AT SCANIA", written by Olle Sandell Ferrada and Edvin Gadelii (2026).