Strategic Supply Chain Simulation
Increasing complexity in product portfolio, components and raw materials, manufacturing technologies and supply chain networks challenge companies to quantify the financial effects of supply chain decisions...

Simulation models can describe highly complex systems, allowing decision makers to experiment non-existing systems as well as policy changes in existing ones, thus creating value in such a complex environment...

Supply chains are getting in backbone position within the companies regardless the industry they are operating. Thus, strategical alignment of company vision and supply chain vision becomes vital in agile environments.

The strategical focus of supply chains can be categorised as operations, outsourcing, channel management, asset network, and customer service.

In all aspects of strategic areas in a supply chain, companies are challenged while making their decisions such as;

- Make-to-order, make-to-stock, make-to-assembly, engineer-to-order, configure-to-order?
- Which items to outsource?
- Where to store items to fulfill channel demand?
- How to optimise asset network?
- How to differentiate service levels?
- How to segment their portfolio?
And many others...

The greatest challenge lies on foreseeing the financial outcomes of management decisions in supply chains.

From growth targets to procurement strategies, forecast accuracy to inventory policies, manufacturing cycle times to order fill rates, each policy and parameter change will bring an impact which is extremely hard to guess and quantify.

Considering the complex network structures and rapidly changing conditions, the unpredictability of policies becomes higher where even classical analytical tools lack functionality. The higher the complexity, the harder to optimise...

We at EY, offer a hybrid modelling of the supply chains where we combine the best practices of planning, inventory theory and system dynamics in order to obtain possibility of an optimum solution with realistic system description.

‘The continuous time approach allows us to calibrate the propagation of the Bullwhip Effect in supply chains.’
(Warburton and Disney, 2007)

‘Quantitative system dynamics models have been used extensively in the area of analysing the bullwhip effect, and have been invaluable for providing answers to set assumptions in given operating conditions’
(Klug, 2012)
Taking into account the holistic approach, it is possible to map the supply chain network with a system dynamics simulation model and observe the behaviour of the system with alternative scenarios related to strategies, policies, and parameters.

The simulation models can include many dimensions of supply chains, where any change in each can be included in the models:

- Long-term plans and horizons of the firm
- Demand seasonality
- Push and pull strategies
- Time-based and quantity-based safety stocks
- Manufacturing cycle times
- Minimum order quantities
- Multi-echelon structures
- Bulk procurement and manufacturing
- Co-flow of side materials
- Warehousing capacities and costs
- Differentiated decoupling points with the supply chain and within the production itself

We believe EY’s capability of simulation modelling will add value to all strategic and tactical decisions related to supply chains with its ability to visualise the key performance indicators and financial impacts.

System Dynamics is being used to model supply chains for various decisions for new product launches, market entry and growth targets as well.

Simulation enables executives to have insights and actionable findings, can be continually updated, and to test policies even for non-existing structures.
About EY

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