Inventory Rebalancing through Lateral Transshipments

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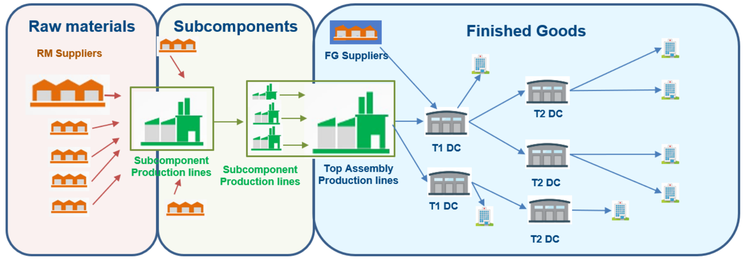
Sponsor: Boston Scientific

Background & Motivation

- **Boston Scientific(BSC) is a global leader in the Medical Devices industry**
  - **Revenue over $10B.**
  - **Treating 30M patients annually across 35000 hospitals globally.**
  - **Global distribution network supported by 50+ DCs, 140+ transportation routes and $1B in inventory.**
- **Motivation**
  - **Post-COVID supply & demand variability created inventory imbalance at a SKU-DC level.**
  - **Product availability is of utmost importance in Healthcare.**



Key Question

Can lateral transshipments optimize service levels and save supply chain costs through inventory rebalancing across a global distribution network?

Relevant Literature

Paterson, C., Kiesmüller, G., Teunter, R., & Glazebrook, K. (2011). Inventory models with lateral transshipments: A review. European Journal of Operational Research, 210(2), 125–136

Lee, Y. H., Jung, J. W., & Jeon, Y. S. (2007). An effective lateral transshipment policy to improve service level in the supply chain. International Journal of Production Economics, 106(1), 115

Banerjee, A., Burton, J., & Banerjee, S. (2003). A simulation study of lateral shipments in single supplier, multiple buyers supply chain networks. International Journal of Production Economics, 81–82, 103–114.

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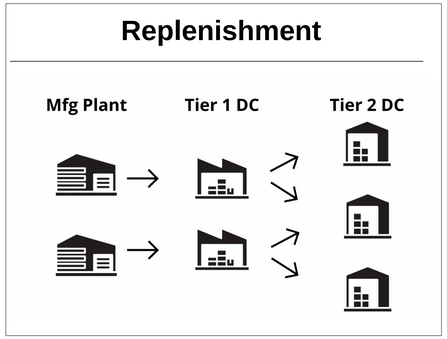
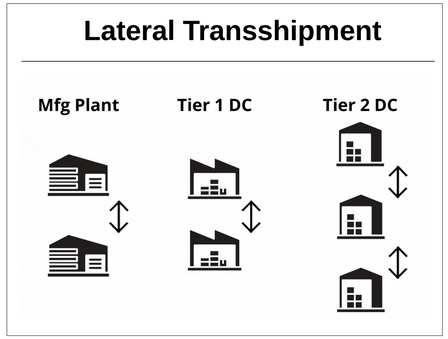
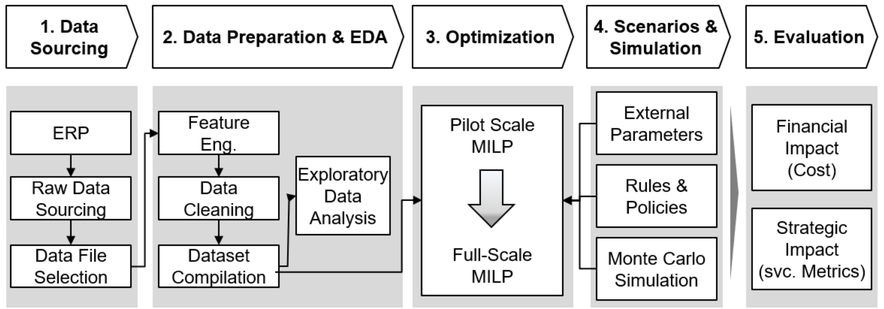




Methodology

- **Primary method is Mixed Integer Linear Programming (MILP) Optimization**
- **Post Optimization scenario analysis and studies to get business insights**

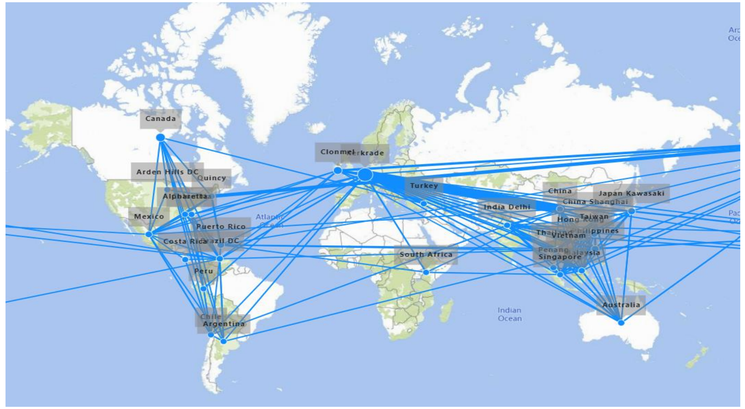


Results

Full scale : 1000 SKUs, 36 DCs (~11K decision variables)

Results

- **Transshipments Executed: 3681**
- **Total Cost Improved from $87M to $65M (25% Reduction)**
- **Europe – Asia and North America – Latin America represent 36% and 32% of total transshipment volume**



Contribution

<u>For the field of inventory balancing</u>, the capstone contributes by providing application-oriented study in a larger scale, higher complexity and incorporation of realistic cost and lead time assumptions.

<u>For BSC</u>, methodologies and models of the Capstone will be considered for implementation to improve product availability and reduce backorders/scrap.

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