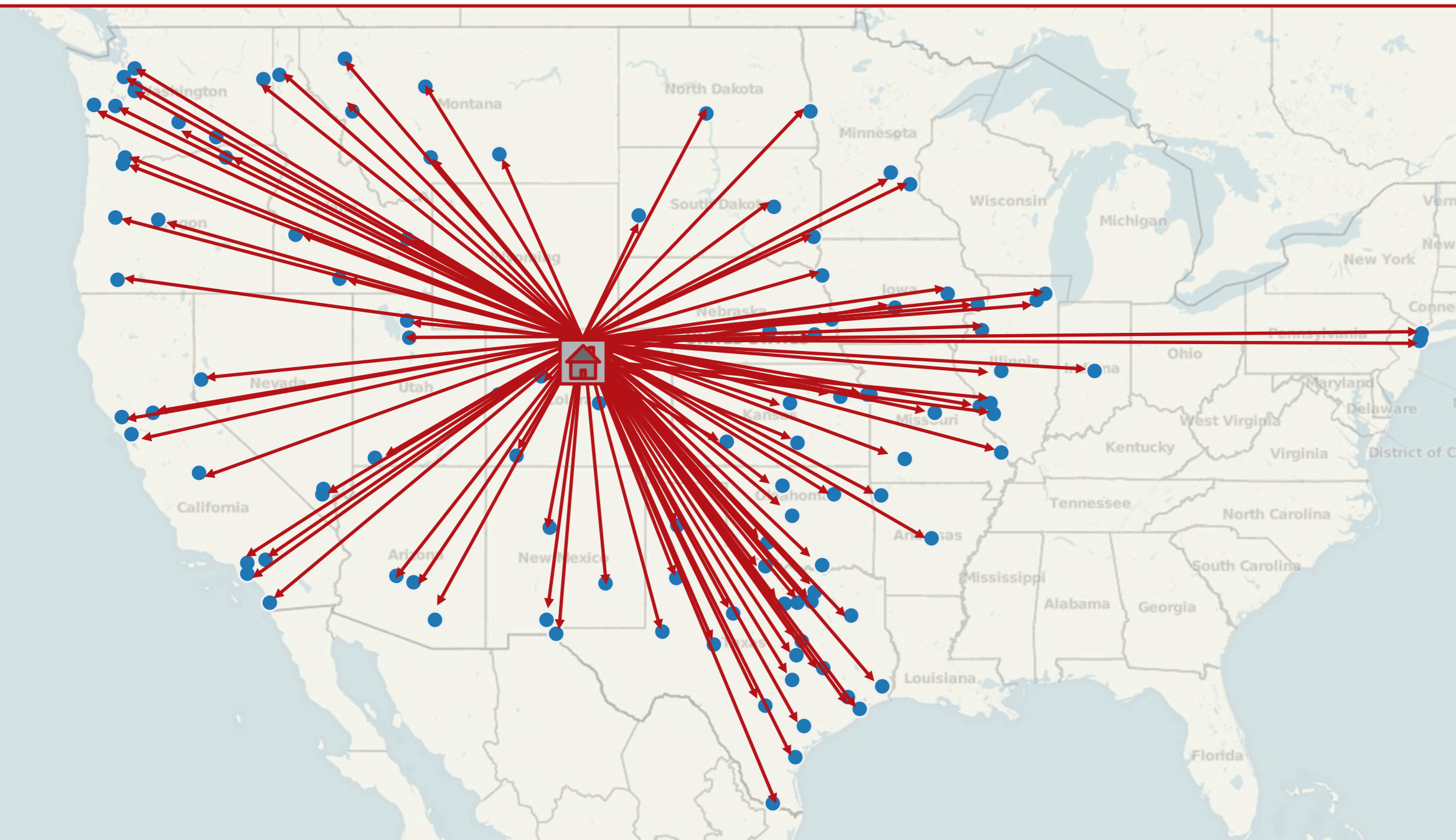


Student: Nate Moison, SCM 2019
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 Sponsor: MillerCoors

Beyond Pareto: Multi-Echelon Inventory Optimization

Motivation / Background

Choosing an optimal inventory policy becomes more difficult as the number of SKUs and tiers in the supply chain increase. Optimizing inventory policies, by more accurately segmenting SKUs, is important to members of all three tiers within the beer industry as they compete for market share amidst rising transportation and commodity costs.



Key Question / Hypothesis

How does incorporating multi-criteria classification of SKUs through data envelopment analysis (DEA) with linear optimization improve the way we determine inventory policy for multi-echelon supply chains?

Relevant Literature

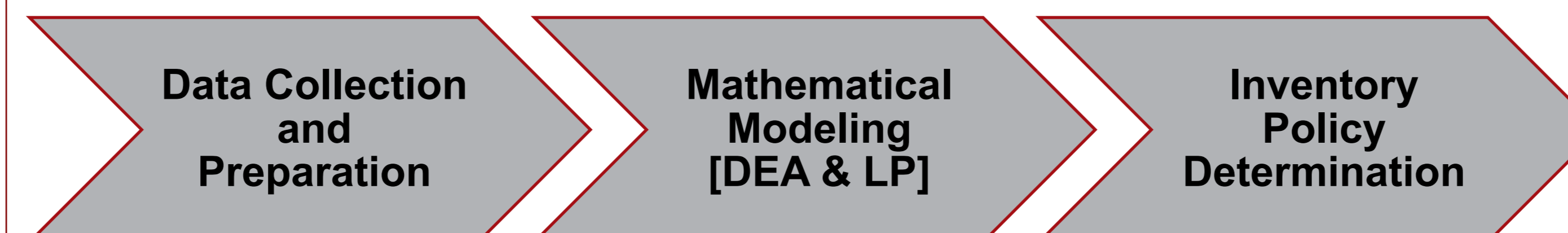
Flores, B. E., Olson, D. L., & Dorai, V. K. (1992). Management of multicriteria inventory classification. *Mathematical and Computer Modelling*, 16(12), 71–82.
[https://doi.org/10.1016/0895-7177\(92\)90021-C](https://doi.org/10.1016/0895-7177(92)90021-C)



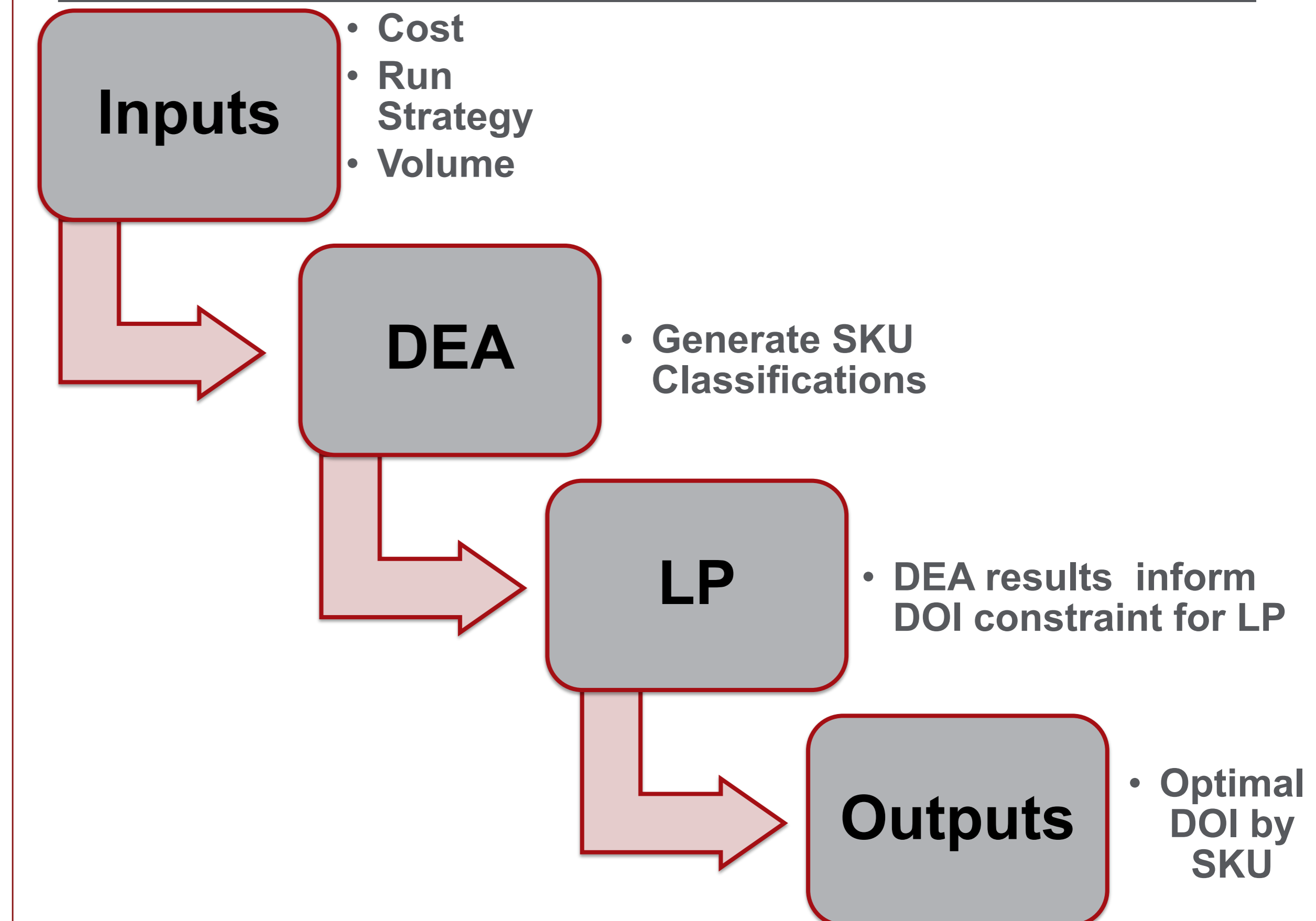
The Problem

- Single criteria segmentation most prominent approach
 - Can create suboptimal classifications and policies
- Key Gaps within current DEA approaches:
 - Difficulty processing large portfolios
 - Incorporating both quantitative and qualitative criteria
 - Lack of field based studies with capacity constraints
 - Prone to subjectivity

Methodology



Initial Results



Expected Contribution

- Academic Contribution
 - Methodology and model which combines DEA and linear optimization to determine inventory policy
 - Field Based Study which includes quantitative and qualitative factors as well as capacity constraints
- Industry Contribution
 - Case Study of MillerCoors Distribution Network
 - Simultaneous Classification of SKUs for each Echelon
 - Recommended Inventory Policy based on Portfolio Approach

