MIT Supply Chain
M A N A G E M E N T

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Sponsor: Niagara Bottling

WHEN IS ENOUGH ENOUGH?
Practical Lot Sizing for the Bottling Industry

MIT GLOBAL SCALE NETWORK
January 2017 Poster Session
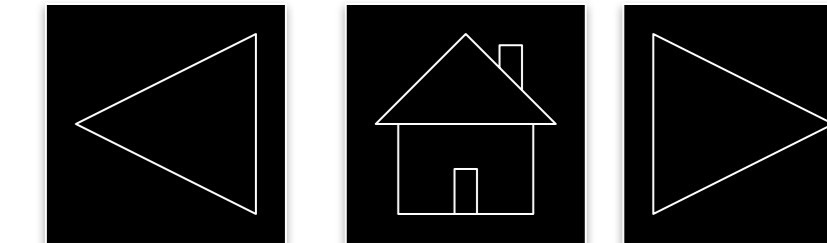
Motivation / Background

Operations Perspective:

➤ Factories seek to maximize efficiency

- Larger lot sizes and inventory

Logistics Perspective:

➤ Logistics group seeks to reduce inventory costs

- Smaller lot sizes and inventory
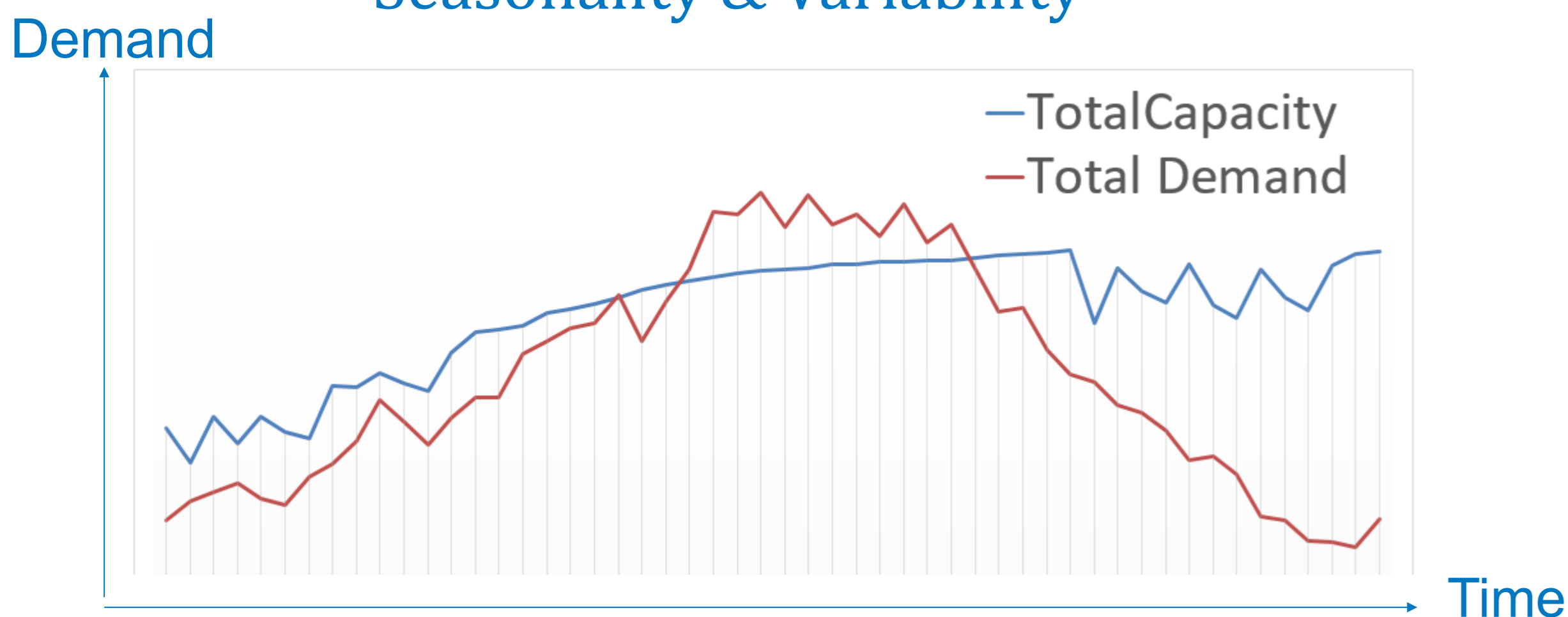
Company Perspective:

➤ Minimize total costs
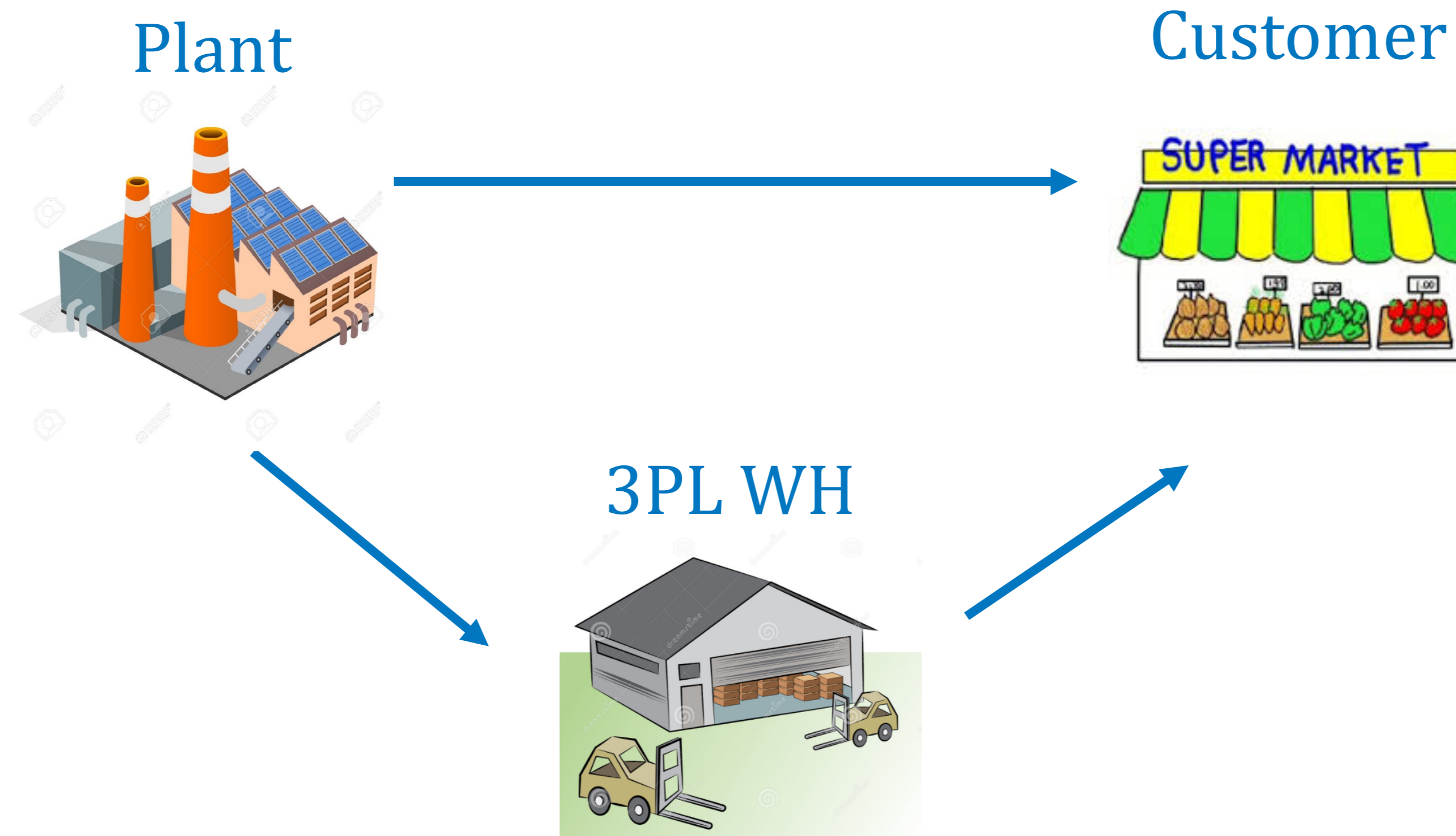➤ Meet demand service levels

Key Question / Hypothesis

➤ What is the optimal lot size to balance production efficiency and inventory holding costs?
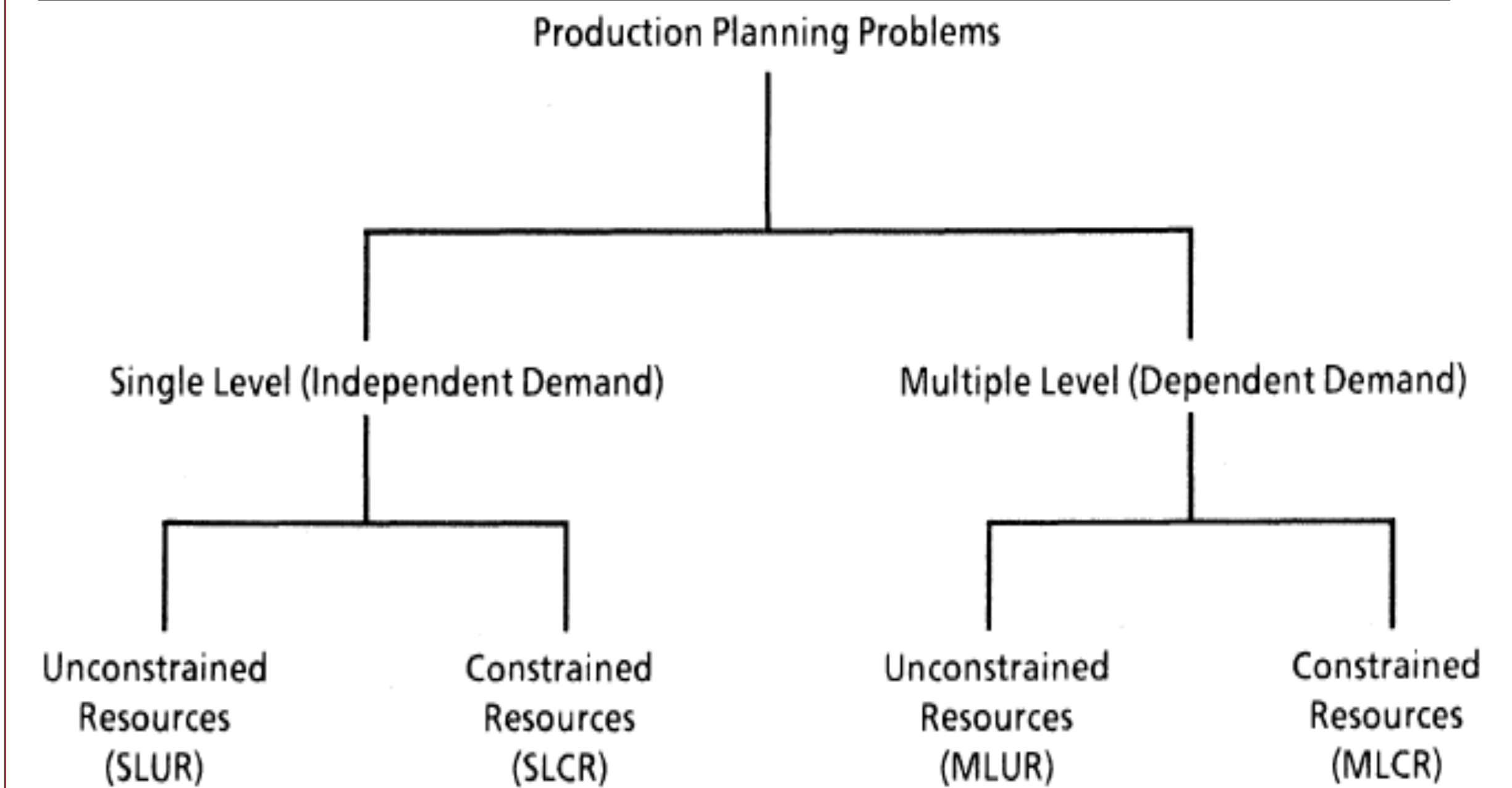
Complications

Seasonality & Variability

— TotalCapacity
— Total Demand

Demand / Time

The Current Setup

Plant

Customer
SUPER MARKET

3PL WH

Potential Formulations

Production Planning Problems

Single Level (Independent Demand)

Multiple Level (Dependent Demand)

Unconstrained Resources (SLUR)

Constrained Resources (SLCR)

Unconstrained Resources (MLUR)

Constrained Resources (MLCR)

Expected Contribution

Data → Model → Methodology → Insights & Policy

✓ Minimize inventory costs

✓ Reduce Changeover costs

✓ Improve communication across planning and operations

✓ Managerial insights: areas to improve

Ian Chua   Thomas Heyward