

Profit
Point, Inc

Supply Chain Network Analysis
and Design

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Overview

- Process Overview
 - Objectives
 - Benefits
- Keys to success
- Examples
- Technology challenges
 - Modeling decisions
 - Data presentation

Network Analysis and Design Objectives

- Provide businesses with the capability to analyze their supply chain production and distribution network.
- Make the tradeoffs of inventory vs. service vs. freight vs. operating costs.
- Align operations with strategic business objectives.

Benefits

- Less Inventory.
- Reduced transportation costs.
- Lower operating costs (manufacturing, warehouse).
- Lower duties and international taxes (including duty drawbacks).
- Better service to customers.

Typical Decisions to be made

- Which plants make which products?
- Which warehouses service which plants/customers? How many warehouses?
- Where should inventory be stored, and how much?
- What modes of transportation should be used to balance cost vs. time (service) objectives?

Different Businesses, Different Cost Drivers

- Polymers: Transportation, Manufacturing.
- Agricultural Chemicals: Inventory.
- Plastics: Customer Service.
- Pacific Region: Raw materials and Duties.

Real Savings

- Pacific Region: Expand capacity. Projected savings \$1.2MM/yr.
- Polymers: Re-allocated manufacturing in NAR plants. Savings \$2+ MM/yr.
- Agricultural Chemicals: Re-allocated business to Toll packagers: Savings \$700K/yr

Keys to Success

- The right process
- The right people
- The right technology

Supply Chain Analysis and Design Process

- Problem definition by business
- Business strategic objectives and requirements
- Collect Data
- Model Supply Chain in tool
- Business refinement cycle

Keys to Success: People

- Commitment from the top, the very top.
- Central responsibility for the entire supply chain process:
 - Manufacturing
 - Logistics
 - Customer Service
- Project definition team
- Supply chain analyst (technical expertise)

Keys to Success: Technology

- Easy to use for business manager
- Flexible to solve supply chain requirements of different businesses
- Easy to integrate with existing material management systems

Pacific Region Expansion

- Definition: Where in Pacific Region should I expand to meet increased demand over next 10-20 years?
- Requirements:
 - Existing capacity
 - Duty, tariffs and restrictions by country
 - Transportation rates (including raw materials)
 - Manufacturing capability and cost by country
- Results:
 - Thailand
 - \$1.2 MM/yr over previous plan
 - Raw Materials and Duties

Polymers North America

- Definition: Which plants to make which products?
- Requirements:
 - Existing capacity (mfg and storage) at 11 plants
 - Sales in bulk and in containers (eg. Drums)
 - Lead time expectations
 - Manufacturing capability
- Results:
 - \$2+ MM/yr
 - Re-alignment of manufacturing operations

Ag-Chem Distribution

- Definition: How to use tollers for dilution and/or packaging
- Requirements:
 - Mutli-tiered network
 - Long lead times
 - Seasonal demand
 - Many toll options
- Results:
 - \$700/K/yr
 - New tollers for packaging

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Modeling Decisions

- What is the Cost Model?
- Level of aggregation of Customer Ship-tos
- Manufacturing Important?
- Manufacturing Type? (Packout, etc)
- Raw Materials important? Which ones?
- Product definition? (Bulk or SKU?)
- Warehouse on/off testing important?
- Units of the Model

Data Presentation

- LP-based results often un-intuitive
- Black box solutions are rarely used
- Challenge
 - Make the results easy to interpret

Data Presentation

■ Some Ideas

- Include a good OLAP tool
- Provide source to destination product tracking
- Visualization aids (maps, charts, ...)
- Add model structure to help reporting

The Bottom Line

- Supply chain design and analysis process consistently realizes 5-15% reduction in supply chain cost.
- Assurance savings consider all supply chain costs.
- Permanently embedded into corporate culture.
- Quick return on investment
- Excellent use of optimization technology to get real savings for business
- Fun