The Role of Mobile Apps in Supply Chain Analysis and Collaboration

Toby Brzoznowski
Executive Vice President
LLamasoft, Inc.
Who designed and engineered this supply chain?

Planning & execution systems address the “as-is” supply chain

How do you find a true break-through improvement?
Supply Chain Modeling Technology

It is:
- “Auto-CAD” for the supply chain

It enables companies to:
- Optimize their end-to-end supply chain operations
- Identify major cost savings and service improvements
- Perform what-if analysis and reduce corporate risk
Discussion Topics

- Modeling Technology in Today’s Supply Chain
  - Questions and Metrics
  - Example Use Cases

- Limitations of Traditional Modeling Approaches

- Can Mobile Apps Play a Role?
  - Advantages vs. Limitations
  - Peek at one such App
Traditional Supply Chain Modeling Use Cases
Supply Chain Design Questions

- What is my actual cost-to-serve each product to each customer?
- From whom should we source?
- How should we flow each product through the network?
- Where and when should we produce each product?
- Where should we stock product?
- How much inventory is enough to meet my customer service requirements?
- How much should I buy and at what price?
- How should I ship my products?
Balancing Supply Chain Metrics

- **Service**
  - On Time Delivery
  - Fill Rate
  - Coverage

- **Cost**
  - Profit, Total Cost, Total Revenue
  - Fixed and Variable Facility Costs
  - Transportation, Inventory, Taxes

- **Logistics**
  - Facility and Equipment Footprint
  - Inventory & Capacity
  - Complexity, Sourcing

- **Sustainability**
  - Greenhouse Gas Emissions / Energy
  - Hazardous or Banned Content
  - Waste

- **Risk**
  - Supply Disruption
  - Transportation Variability
  - Demand Volatility
  - Supply Volatility
  - Sensitivity to Costs
  - Natural Disasters, Structural/Geographic
  - Geopolitical Change
Demand Throughout the Country
Widely Varying Demand by Location
As-Is Costs and Operations
Optimized As-Is Supply Chain

- Product Flowpath
- Production Footprint
- Cost-to-Serve
Supply Chain Segmentation

Financial | Service | Risk | Supply Chain | Sustainability
--- | --- | --- | --- | ---

Diagram showing cost breakdowns for different segments.
Multi-Echelon Safety Stock Optimization

Key Benefits and Usage

- Multi-Echelon Safety Stock optimization allows the model to achieve savings in working capital while simultaneously maintaining or increasing service level to stores.
- Scientifically quantify cost or benefits of service level, sourcing, and contractual lead time agreement changes.
- Combine with network optimization to set optimal inventory planning policies. ie Reorder point, order quantities by site by product.
- Model can automatically profile historical sales data or use forecast and forecast error as inputs.
- IO Select functionality allows automated filtering of products with non-normally distribution demand.
Optimized As-Is Supply Chain
New Transportation Routes
Service Based Optimization

Service Based Greenfield Formulation

Center of Gravity Greenfield Formulation

Key Benefits and Usage

- Depending on the objective, Greenfield analysis can either be performed using Center of Gravity or Service Based methods.

- Service Based Optimization allows the model to decide “How Many?” and “Where?” given customer locations and service requirements.

- Service Based Optimization can provide a strategic advantage from a service lead time perspective. The objective is to cover the most number of customers using the fewest number of distribution points within a defined set of service goals.

- Center of Gravity Formulation solves the “Where?” question given customer locations, demand volumes, and number of DCs as inputs.

- The Center of Gravity method can often yield the lowest cost solutions from a freight perspective. It is often utilized for completely realigning the current footprint or identifying the next best location to setup a facility.
Huanghua DC shut down increases freight spend by 2% while service distance increases by 7%.
Risk Management
Commodity Pricing Shocks

Baseline Sourcing Pattern

Business Continuity Plan

Key Benefits and Usage

- Pre-plan supply chain responses in response to various risks in supply, demand, weather and geo-political events.

- Identify optimal alternate suppliers, carriers, production sites, distribution paths, etc. prior to supply chain risk events occurring

- Understand the impact to capital expenditures, operating expenses and service to customers

- Combine optimal designs with discrete event simulation to predict and anticipate impact to daily operations

- Model varying lengths of risks for different supply chain responses
Sustainability Optimization

Baseline GHG Network Profile

35% GHG Reduction Network Profile

Key Benefits and Usage

- Quantify financial benefit or costs of achieving sustainability goals
- Built in published emission factors accurately models and outputs emissions from various forms of transportation
- Optionally, carbon offsets are calculated as a part of the profit and loss calculations
- Fees and duties as a result of non-green equipment/facility usage can be incorporated into the overall profit and loss calculations
- Ramp up of sustainability efforts can be modeled as a multi-year green house gas reduction initiative
Key Benefits and Usage

- Optimize network with tax/duties considerations
- Apply tax/duties/tariffs based on transfer pricing across regions
- Calculate tax/duties/tariffs based on revenue
- Calculate tax/duties/tariffs based on import/export arrangements
- Capture region specific product standard cost based on production cost and exchange rate differences
- Determine tax/duties/tariffs based on region to region movements
- Account for tax/duties/tariffs based on invoicing locations
Freshness Considerations

**Key Benefits and Usage**

- Production with freshness – what if’s to optimize production lot size against probability of dumping
- Product flow contingency planning with freshness – flow paths that minimize freight, inventory and spoilage costs
- Inventory planning with freshness – minimize inventory with respect to shelf life, service level agreements and production constraints
- Ability to track to true age of productions
- Minimize obsolescence and cost write downs for high turn-over items (ie fashion, electronics)
Can Mobile Apps Replace Traditional Models?
Challenges of Creating & Leveraging Models

- Data Access
- Data Quality

- Expertise
- Answer Speed

Supply Chain Designers

Supply Chain Guru®

Corporate Data

ERP, MRP, TMS, BI, SCM, Excel, etc.

- Same Language?
- Proprietary Info

Business Partners

Customers, Suppliers, 3PLs

Business Leaders

Sales, Operations, Procurement, Finance, etc.

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The Near-term Opportunity for Mobile Apps

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The first true office equipment simulator, SimStapler© brings all of the thrill and excitement of a “real” stapler right to the palm of your hand.

What's New in Version 1.3

Added "Visit us" information so you can check out more great games and apps from Freeverse. Might we recommend Flick Fishing and Flick Bowling? Beautiful 3D graphics and captivating gameplay.
Tablets are becoming the next generation of business communication:

- Excel at visual display of information
- Require zero training
- Allow for rapidly deployed solutions
- Offer fast and intuitive modeling
- Widely adopted by executives

Source: Gartner
Concept: A Smart Cocktail Napkin
Concept: A Smart Whiteboard
Create a Platform to:

- Visualize and interact with the supply chain
- Rapidly experiment with new ideas
- Represent the cost and impact of decisions
- Share designs with the other decision makers
- Graduate designs to traditional modeling software
What would this app look like?

- Radical ease-of-use
- 100% visual design environment
- Import traditional models or start from scratch
- Built in reference cost and benchmark data
- Ability to share with anyone
- Export and upsize designs to engineering grade software apps
Supply Chain Sherpa Mobile App
This is a message from Sherpa. Please find attached a Sherpa Portfolio that can be opened in LLamasoft Sherpa for iPad.
Summary
Summary

- Planning and execution applications are great for automating the **as-is** supply chain, but cannot address the **to-be** or answer **what-if**

- Traditional modeling technology has been the approach used to address the what-if, but there are challenges:
  - Requires skilled and well-trained data analysts
  - Time consuming and data intensive

- Mobile applications are accessible to a wider corporate user base, and can be used to shape supply chain decisions and facilitate collaboration
  - Detail and precision is the trade-off
See How Supply Chain Sherpa Works

…and enter to win a **free download** of Supply Chain Sherpa Premium (an $899 value) at www.llamasoft.com/GMA-FMI
Questions