JDA Supply Chain Strategist

Hugh Hendry – JDA
Greg Lawless - Enzyme
Agenda

Supply Chain Strategist – Business Challenges

- Supply Chain Strategist Solution Overview

Success Stories

Summary Benefits

Q&A/Next Steps
What is Supply Chain Network Optimization?

• Objective: Design supply chain for maximum profitability and service

• Challenges:
  – Facility location and capital investment timing
  – Selection of transportation modes
  – Where should we place our merchandise

• Capability: Optimization, “what-if?” analysis

• Benefit: Long-term profitability and sustained competitive advantage
Business Growth Challenges:
- Continuous SC Network Optimization

- Rapid growth is (or soon will be) exceeding current capacity
- Recent or future merger or acquisition
- Considering capital investment in systems, production, or global facilities
- Expanding into new global markets or new products
- Need to reduce redundancy and risk in the supply chain
- Evaluating changes between direct models and traditional channel strategies
Business Competitive Challenges:
- Continuous SC Network Optimization

• Need to create optimal 1 or multi-year strategic plan
• Inefficient or inflexible supply chain configuration to meet shifting demands
• No systematic, repeatable process for planning for demand growth (capacity planning)
• Cannot conduct strategic war gaming “what if” scenarios when dynamic external factors or requirements change
Opportunities for SCS –
Network Strategy Decisions

• General
  – Where should manufacturing or distribution centers be opened, or closed? When?
  – How should merged companies realign their assets?

• Suppliers
  – How can the number of suppliers be reduced while improving financial performance?
  – How to optimize onshore vs. offshore suppliers?

• Manufacturing
  – When will manufacturing capacity be exceeded and what investments should be made?
  – Which products should be made in each manufacturing facility and/or production line?
  – What are the cost trade-offs of outsourcing or foreign manufacturing strategies?
Opportunities for SCS –
Network Strategy Decisions (continued)

• Distribution
  – What types of logistics facilities are required to support finished goods distribution? Distribution centers? Cross-docks?
  – Where should current and new facilities be located? How large should they be?
  – Which customers and products should be served from each facility?
  – Which ports should be used to bring product into and out of a country?

• Transportation
  – What transport modes and lanes should be used to move products throughout the network?
  – Which products, if any, should move directly from manufacturing centers to consumers?
Opportunities for SCS – Strategic Master Planning

- **Strategic Master Planning**
  - Making many of the same kind of decisions with a shorter timeframe of months or quarters
  - How much should I produce, store, and ship each month given the expected seasonal demand so that I minimize total cost but still meet my service levels?
  - How should I realign manufacturing and distribution to support new product introductions?
  - How much inventory should I build ahead in anticipation of a seasonal demand increase?
  - When should I change suppliers or sourcing for my raw materials?
  - When should I plan to invest in additional capacity?
Emerging Use –
Carbon Footprint Modeling

- Carbon footprint is becoming critical consideration for all types of enterprises
- Given that SCS helps determine a company’s strategic direction, carbon footprint is a natural part of this strategy
- Traditional SCS models can also include CO2 concerns
  - Carbon footprint estimate for baseline network
  - Carbon footprint estimate for “what if” scenarios
  - Constraints on carbon emissions, full model or by time period
  - Carbon tax – cost of CO2 per kg produced
  - Cap & Trade market dynamics
Emerging Use –
Carbon Footprint Modeling (continued)

• Flexible paradigm will accommodate other sustainability concerns
  – Water utilization
  – Waste production
  – Other pollutants

• Strategic plans should include:
  – Understanding the company’s carbon footprint – before and after network changes
  – Meeting targets set by government agencies for carbon emissions
  – Reduction of carbon emissions through capital investment and/or operational changes
Many Network Design Exercises Still Use Spreadsheets

- Lack of Optimization
  - Yielding non-optimal or only locally optimal results
  - Unrealistic/infeasible plans
- Lack of Flexibility
  - No power to solve overall network strategy
- Lack of “what-if” capabilities
  - No strategic war-gaming capability

- Unrepeatable process
  - Lacks speed
  - Lacks formality
- Lack of scalability
  - Network evolves in an unplanned, sub-optimal manner
Agenda

Introductions and JDA Corporate Overview

Supply Chain Strategist – Business Challenges

Supply Chain Strategist Solution Overview

Success Stories

Summary Benefits

Q&A/Next Steps
What is Supply Chain Strategist?

Supply Chain Strategist is a strategic and tactical modeling tool that allows us to optimize a supply chain while considering all necessary trade-offs between costs, constraints, service levels and business objectives.
What is Supply Chain Strategist?

Supply Chain Strategist…

• Provides a structured way to quickly represent complexities and interdependencies of the entire supply chain – suppliers to customers and everything in between

• Allows flexibility to model any supply chain
  – Commodities to Consumer Goods
  – Manufacturing to Retail
  – Distribution & Transportation

• Supports both single- and multi-period planning in the same application with the same capabilities

• Constructs and manipulates many “what-if” scenarios

• Uses mathematical (LP/MIP) optimization – results are truly optimal

• Supports rapid strategic planning with an intuitive graphical user interface

• Provides easy, yet powerful reporting capabilities to maximize analytical and presentation opportunities
Features of SCS - Flexible and Intuitive Modelling Paradigm

Build a flexible **model** of your business rather than force-fitting into a rigid model

- Facilities are the network of suppliers, plants, DCs, ports, cross-docks, etc.
- Processes can represent simple transformations to multi-stage production processes
- Products are defined at very detailed to very aggregated levels
- Transportation modes define the physical methods and transportation carriers as applicable
- Time Periods
  - Single and multiple-period models in one solution
  - Simple method to change time period structure
Features of SCS - Flexible and Intuitive Modelling Paradigm (con’d)

- Demand and its geographic locations drive the optimization
  - Service levels are respected
  - Single-sourcing constraints can be enforced through “bundling”
  - Demand can be discretionary or non-discretionary

- Costs are captured at any level of the supply chain
  - Processing and handling
  - Transportation, including distance-based, parcel and LTL*
  - Fixed, closing and opening costs for facilities, processes and products - by time-period
  - Inventory (holding and in-transit)

* LTL rating is available with purchase of 3rd party rating engine
Features of SCS - Flexible and Intuitive Modelling Paradigm (con’d)

- Designed for use at the operations/logistics/engineering level, not IT
- Outstanding analytic and reporting capabilities
  - Maps
  - Charts
  - Summary views
  - Analysis and reporting database
- Solving capabilities
  - Scalable, realistic
  - Minimize cost, maximize profit
  - Data validation and error checking
- Simple constraint modeling
- Scenario creation and comparison
Features of SCS –
Easy import and export of data

- All data and graphical objects in the model can be imported, exported, or copied/pasted
  - Automated Import/Export “Wizard” guides user through the process
  - Batch Import/Export functionality supports mass updates
  - Smooth integration with Microsoft Access and Excel as well as enterprise databases such as SQLServer and Oracle
  - Maps, charts, data views can be copied/pasted for presentation of results in any format (e.g., PowerPoint, web)
Features of SCS – Powerful, intuitive Graphical User Interface

• Drag-and-drop items on the world-wide interactive map
• Instant custom graphs, tables, and charts from the memory-resident database
• Control center enables easy access to all data
• Add, modify, delete data on the fly
• “Save” and “Save-as” for intuitive scenario management
• User-defined scenario summary reports
• Dynamic update of tables, maps, charts based on optimization
Features of SCS – Linear and Mixed Integer Optimization

• Scalability and speed
  – SCS can handle large, complex supply chains
  – Automated server can optimize multiple scenarios in batch mode

• Accuracy and realism
  – Optimization yields a true optimum – no heuristics are used
  – Makes on/off decisions with fixed, opening, and closing costs on facilities and individual activities within the facilities
  – Step cost functions allow the representation of realistic capacity sizing and economies of scale
Multiple objectives
- Minimize cost while serving all demand
- Maximize profit by serving profitable demand
- Both objective functions are subject to constraints such as capacity and service levels

Infeasibility avoidance
- In-line validation identifies potential problems before the cause infeasibility
- Automatic report identifies likely causes when model is infeasible
A Sample SCS Scenario

Given Demand, Manufacturing & Distribution Facilities, Costs
Baseline Network –
Before Optimization

Demand Regions are colored based on serving DC

10 DCs in the baseline network

Average Landed Cost of $12.00 per unit across the network

Average Landed Cost of $12.00 per unit across the network
Baseline Network –
Charts

Distribution Center
Handling

Average Landed Cost by Demand Region
Optimal Network – After Optimization

Demand Regions are colored based on serving DC – Candidate DCs are now used

12 DCs, including 3 new ones in the revised network

Average Landed Cost of $11.04 per unit across the network
Optimal Network –
Charts

Distribution Center Handling
• New DCs in Dallas and Los Angeles
• Las Vegas DC eliminated

Average Landed Cost by Demand Region
Agenda

Supply Chain Strategist – Business Challenges
Supply Chain Strategist Solution Overview

Success Stories

- Summary Benefits

Q&A/Next Steps
## Supply Chain Strategist Customers

### Sample Customers by Industry Vertical

<table>
<thead>
<tr>
<th>Consumer Industries</th>
<th>Retail</th>
<th>Transportation</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>PepsiCo/Frito-Lay</td>
<td>Best Buy</td>
<td>UPS Logistics</td>
<td>Cooper Tire</td>
</tr>
<tr>
<td>Tropicana</td>
<td>Sears</td>
<td>BNSF Logistics</td>
<td>Delphi</td>
</tr>
<tr>
<td>Quaker Oats</td>
<td>Radio Shack</td>
<td>YRC Logistics</td>
<td>Caterpillar</td>
</tr>
<tr>
<td>Hanes Brands</td>
<td>Petco</td>
<td>Ryder Logistics</td>
<td>PSS World</td>
</tr>
<tr>
<td>Grupo-Modelo</td>
<td>Michaels Stores</td>
<td>DHL Express</td>
<td>Medical</td>
</tr>
<tr>
<td>Avery Dennison</td>
<td>Shaws</td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>Andersen</td>
<td>Supermarkets</td>
<td></td>
<td>Chemical</td>
</tr>
<tr>
<td>Windows</td>
<td></td>
<td></td>
<td>Covidien</td>
</tr>
<tr>
<td>Schreiber Foods</td>
<td></td>
<td></td>
<td>Delphi</td>
</tr>
<tr>
<td>Dell</td>
<td></td>
<td></td>
<td>Caterpillar</td>
</tr>
<tr>
<td>LG Electronics</td>
<td></td>
<td></td>
<td>PSS World</td>
</tr>
<tr>
<td>Nokia</td>
<td></td>
<td></td>
<td>Medical</td>
</tr>
<tr>
<td>Coca-Cola</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
<td></td>
<td>Chemical</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Medical</td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Chemical</td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Medical</td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Chemical</td>
</tr>
<tr>
<td>Enterprise</td>
<td></td>
<td></td>
<td>Occidental</td>
</tr>
<tr>
<td>ConAgra</td>
<td></td>
<td></td>
<td>Medical</td>
</tr>
</tbody>
</table>
Business Overview

- Headquartered in Austin, Texas, Dell is a top world computer systems company
- Annual revenue of $57 billion
- Over 88,000 employees worldwide
- Global company with production in Austin, TX; Nashville, TN; Winston-Salem, NC; Penang, Malaysia; Xiamen, China; Limerick, Ireland; Eldorado do Sul and Hortolandia, Brazil

Business Objectives

- Grow Dell’s advantage in a competitive marketplace
- Minimize supply chain costs from suppliers to factories to customers
- Reduce inventory, increase throughput, improve velocity

SCS Approach and Benefits

- Pinpoints sourcing, manufacturing, and warehousing locations
- Optimally allocates manufacturing and warehousing resources
- Contributes to Dell’s ability to implement strategic solutions through a fast, flexible, maintainable analysis process

Dell has identified value in excess of $1 billion over the 4 year planning horizon with SCS
Shaw’s Supermarkets
Case study

Business Overview

- More than $4.5 billion in sales
- Approx. 170 stores in New England (MA, CT, VT, ME, RI, NH)
- Number 1 or 2 in all markets
- Two distribution centers

Business Objectives

- Realignment of distribution after acquisitions
- Re-evaluate third-party distributor locations
- Re-evaluate item positioning (grocery items)
- Evaluate transportation alternatives

Results of Study

- Closure of East Bridgewater, Lakeville Distribution Centers
- Change in third-party distribution locations
- Opportunity to re-evaluate item positioning (grocery items)
- Re-visit store/distribution center alignments
- Optimized volume between suppliers of fast moving items
- More than $2 million savings opportunity
- Distribution costs
- Transportation savings
Cooper Tire & Rubber Company
Case study

Business Overview
• Tire Group
• 2006 revenue of $2.6 billion
• 4th largest tire manufacturer in NA and 9th largest worldwide
• 10 tire manufacturing locations worldwide
• Maintains 63 manufacturing, distribution, retail stores and office facilities worldwide
• Focus on the manufacture and sale of

Business Objectives
• Aggressive acquisition strategy has led to redundant and overlapping networks. Rationalize network to eliminate redundancies.
• Determine whether stocking and producing locations are properly aligned with current and emerging demand regions. If not, determine optimal alignment
• Promote operational synergy and economies of scale

Results of Study
• 8 facility closures
• 2 regional DC additions
• 2 DC consolidations
• Direct ship lanes identified
• Central US service improved
• Freight spend reduced
• Cycle time reduced
PolyOne

Case study

Business Overview

• 2006 revenue of $2.6 billion
• Leading global supplier of specialized polymer materials, services & solutions
• Aggressive owner of a network of businesses, providing value added products and services that link fabricators and consumers

Business Objectives

• Create a responsive, flexible supply chain that delivers superior service at the lowest total supply chain cost
• Enhance asset utilization across the network

Results of Study

• Cost avoidance (fixed assets)
  • Before SCS: Supply Chain assets
  • With SCS: 7.7 million
• Fixed costs: Reduced $5.3 million
• Variable costs: Reduced $20.7 million

• Logistics costs:
  • Before SCS: Inefficient supply chain network
  • With SCS: Reduced $1 million
• Indirect material costs: Reduced $0.7 million

PolyOne unleashed value in excess of $30 million with SCS
Agenda

Supply Chain Strategist – Business Challenges
Supply Chain Strategist Solution Overview
Success Stories

Summary Benefits

Q&A/Next Steps
• Typical impacts of various planning efforts:
  – Strategic planning: 10 % to 20 % improvement
  – Tactical planning: 5 % to 10 % improvement
  – Operational/transactional: < 5 %
Typical Quantifiable Benefits of Continuous SC Network Optimization

- Increase customer service levels 1% to 5%
- Maximize service of profitable customers >95%
- Reduce operating costs (freight, handling, manufacturing, procurement) 5% to 10%
- Reduce facility and in-transit inventory (raw materials, WIP, FG) 20% to 30%
- Reduce fixed assets (consolidate warehouses, plants, production)

How SCS Helps Deliver Value

VALUE/ROA
Sales
COGS & SG&A
Asset
Summary – Why Supply Chain Strategist?

- Proven Track Record (10+ years)
- Strategic Planning Weapon
- Supply Chain Agility
- Higher Service Levels
- Improve Inventory Turns
- Total Profit Optimization
- Improved Decision-Making
- Reduce Overall Supply Chain Costs
- Risk Mitigation
- Ease of Use
- JDA Domain Experience
SCS Solution Delivery Model

- Two alternative paths to rapid value with minimum risk

**Strategic Engagement**
- Establish strategic objectives
- Build initial models
- Identify/build scenarios
- 10-12 weeks

**Update Service**
- Off-site model build
- Updates of strategic models as required

**License Model**

**Product Deployment**
- On-site model build
- Client training

**Continuous Learning Process Improvement**
Agenda

Supply Chain Strategist – Business Challenges
Supply Chain Strategist Solution Overview
Success Stories
Summary Benefits
Q&A/Next Steps