Inventory Optimization using SmartOps – Case study from Teknokret

Ketul Patel, Teknokret
Visit and contact us at http://www.teknokret.com for more assistance with this.
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<td><strong>LA Dodgers</strong></td>
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Inventory Planning is a lot like Baseball

<table>
<thead>
<tr>
<th>Baseball</th>
<th>Inventory Planning</th>
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<tbody>
<tr>
<td>What’s the score?</td>
<td>How much do I need?</td>
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<td>Quantity over time, Periods of Cover</td>
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SAP Benchmarking Confirms Inventory Reduction Opportunity

Inventory Levels vs. Maturity of Safety Stock Processes

Overall Best Practice Adoption

Low: Process Not Defined
Med: Process Defined within Inv Planning
High: Formal, global process with clear accountability

~20% less inventory

Best Practice:
“Formal, globally applicable process to manage safety stock levels with clear accountability”

Source: SAP Benchmarking
SmartOps is the SAP Solution Extension for EIO

**Key Takeaways**

- SAP realized it had a gap in its supply chain planning solution when it came to inventory optimization.
- After doing an extensive evaluation of the inventory optimization space, SAP decided that it made sense to partner with SmartOps, the market leader in inventory optimization.

**Highly-selective (<15 companies) invitation-only business and technology partnership**

- Solution Extension Partner
  - (May 2009)
- Endorsed Business Solution Partner
  - (2006)
- Industry Value Network Partner
  - (2006)
- SAP NetWeaver, xApp Certification
  - (2005)

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What are some example Customer benefits of a SAP Solution Extension?

**SAP-SmartOps Joint Development**
- Sharing of current and future solution map – collaboration on ongoing development
- SAP testing and solution qualification of SmartOps solution
- Interfaces are supported by SAP and SmartOps as the products are updated, reducing cost and risk

**SAP-SmartOps Joint Delivery**
- Coordinated pre-sales, sales, and value engineering builds a clear value proposition and reduces sales/purchasing process complexity and risk
- SAP EIO by SmartOps can be purchased on SAP paper, leveraging existing SAP license agreements

**SAP-SmartOps Joint Support**
- SAP provides Level 1&2 support and customers may use SAP OSS to manage the customer service process
<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>SmartOps®</th>
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</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>Single stage, single time period</td>
<td>Multi-stage, time phased</td>
</tr>
<tr>
<td><strong>Data</strong></td>
<td>Poor data quality and limited insight into inventory drivers</td>
<td>Data Confidence and analysis into what drives inventory</td>
</tr>
<tr>
<td><strong>Technology</strong></td>
<td>“Rule of thumb” or Deterministic</td>
<td>Stochastic – understands impact of variability</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Infrequent changes to inventory policy</td>
<td>Adapts inventory strategy as supply chain changes</td>
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</table>
How Inventory Optimization Complements SAP

Supply Chain Challenges

... more layered, multi-tier supply chains

... more frequent product launches

... increasing customer service expectations

Multi-echelon Safety Stock

VMI Customer
DC
Central DC
MFG
Suppliers

Inventory Segmentation

Inventory Forms

Inventory Purposes

Service Level Optimization

Basic A,B,C Segmentation

Optimal Service Level for Every Product, Location Combination

Enterprise Inventory Optimization

- Advanced demand, supply & production variability analysis
- Optimal, time-phased inventory policies for multi-tier network
- Inventory segmentation

SAP SCM & SAP ERP

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SmartOps’ data model considers supply chain complexities

**Master Data**
- Item- Locations
- Inventory unit cost
- Units of measure
- Holding cost percent

**Uncertainty Data**
- Forecast Error/Std Deviation
- Total Lead Time Std Deviation
- Attainment loss % and Std Dev
- Source Reliability
- Risk pooling factor

**Replenishment Planning Data**
- Forecast
- Review frequency
- Total mean lead time
- Target service level
- Minimum/incremental batch size
  - Sourcing fractions/quotas
- Frozen window/Planning fence
- Service time
  - Minimum stocking requirement

**Scenario Analysis and Alerting**
- Inputs
  - Initial on hand inventory
  - Planned receipts
  - Max ship life
  - Costs: processing, transportation, order administration, handling, unit purchase, unit transfer price, other

**Manufacturing / Process Data**
- BOM relationships / qty
- Yield
- Max process capacity
- Min process quantity

**Comprehensive data model**

\[C \rightarrow S\]

\[S \rightarrow \text{Uncertainty Data}\]

\[\text{Uncertainty Data} \rightarrow \text{Replenishment Planning Data}\]

\[\text{Replenishment Planning Data} \rightarrow \text{Scenario Analysis and Alerting}\]

**Bold** = Basic input
**Italics** = Additional input
Optimal inventory targets calculated by SmartOps sent to SAP Supply Network Planning (SNP)
Dynamically position and optimize inventory in multi-tier manufacturing & distribution supply chains with SAP Enterprise Inventory Optimization

Key Capabilities Offered

- Multi-echelon inventory optimization
- What if scenario analysis
- Supply chain visibility and operational synchronization
- Efficient alerting and management by exception
- Robust industry data model and data validation process
- Advanced demand, production, and supply analytics
- Preconfigured Standard Data Interfaces with SAP
What is the Opportunity to Move the Needle at CPG Organization?

**Definitions and 5 Year Trend Observations**

- Days in Inventory is a financial measure of a company's performance defining how long it takes a company to turn its inventory into sales. \( DII = \frac{\text{Inventory}}{\text{COGS}} \times 365 \)
- CPG Organization has made improvement in DII from FY 05 to FY 09.
- However, CPG Organization is lagging behind Consumer Goods peer set identifying an opportunity to achieve incremental benefits enabled by Enterprise Inventory Optimization.

In addition, we compared CPG Organization’s Days in Inventory (DII) performance to SAP’s Consumer Goods Benchmarking database consisting of 97 peer companies. CPG Organization is currently holding 69 DII and performing slightly better than average benchmark. However, each day improvement represents $18M in free cash flow.

What Moving the Needle Could Mean to Heinz:

* Every one day improvement in Days in Inventory = $17.98M in free cash flow

Source: SEC Filings; SAP ASUG Benchmarking, SAP Analysis
SAP, SmartOps and Teknokret help ConAgra Streamline Its Supply Chain

QUICK FACTS

ConAgra Foods Inc.
- Headquarters: Omaha, Nebraska
- Industry: Consumer products
- Revenue: US$11.6 billion
- Employees: 25,000
- Web site: www.conagrafoods.com
- SAP® solutions and services: SAP Supply Chain Management application, SAP Advanced Planning & Optimization component of the SAP Business Suite family of business application
- Partner: SmartOps Corporation

Key Challenge
Optimize inventory decisions while paring down 11+ supply chain planning applications

Ecosystem Engagement Highlight
Took advantage of SmartOps Corporation’s participation in the Industry Value Network group for consumer products

Ecosystem Component Engaged
SmartOps Multistage Inventory Planning & Optimization, an SAP-endorsed business solution provided by SmartOps, an SAP® software solution partner and member of 4 groups within the Industry Value Network program

Benefits
- Improved days in inventory (-7%), store in-stock rate (+0.7%), forecast accuracy (+30%), and case-fill on-time rate (+0.2%)
- Maximized value of investment in SAP software

Lesson Learned
Connect with other SAP customers to learn how they are addressing similar issues

Next Steps
- Access communities and forums to find out how others are using the solutions in their business processes
- Reach out to other SmartOps customers to leverage insights before upgrading

“The synergies between the SAP software and SmartOps solution help us extract the most value from our existing SAP software investments and achieve our goals of optimizing inventory.”

Steve Vielmetti
VP, Demand Planning and Supply Chain Optimization
ConAgra Foods Inc.
## SAP’s Enterprise Inventory Optimization Driving Kellogg’s Supply Chain

### QUICK FACTS

**Kellogg’s**
- Industry: Consumer Products
- Revenue: US$12.8 billion
- Employees: 32,000
- Headquarters: Battle Creek, Michigan
- Web site: www.kelloggs.com
- SAP partner solution: SAP’s Enterprise Inventory Optimization by SmartOps Corporation
- Implementation partner: SmartOps

### Key Challenges
- Large number of Finished Goods with frequent product substitutions
- Complex multi-echelon supply chain
- Challenged with managing and accurately forecasting seasonal demand
- Struggled with maintaining customer service levels

### Implementation Best Practices
- Implementation focused on North America
- "Attended" mode completed. Using manual data feeds

### Why SAP Partner Was Selected
- Multi-echelon, time-phased inventory planning and optimization
- Integration to SAP & Manugistics

### Low Total Cost of Ownership
- Extremely reliable solution
- Integrated into Kellogg’s planning environment

### Operational Benefits
- 15% First year inventory reduction
- Payback in less than 12 months

### Financial and Strategic Benefits
- Better customer service
- Reduced inventory
- Raw material and BOM optimization
- Scenario analysis
- Optimized multi-echelon SKU inventory location policies
- Better understanding of the individual components of inventory

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Kellogg's is a well known brand delivering some of the world’s best loved foods. Included in the Kellogg’s family is Keebler, Famous Amos, Carr’s, Cheez-It, Eggo and many others.
Wyeth Transforms Inventory Management with SAP’s Enterprise Inventory Optimization

Key Challenges
- Increasing Inventory Levels
- Challenged to maintain Customer Service Levels
- Manage multi-echelon supply chains
- Determine optimal inventory policies

Implementation Best Practices
- Implementation in 2 phases
  - Phase 1 "Attended" mode completed. Using manual data feeds
  - Phase 1 "Unattended" mode underway. Using automated interfaces to ERP & APO.

Financial and Strategic Benefits
- Better customer service
- Reduced inventory
- Consistent planning process
- Alignment of planning and execution at sites
- Deeper understanding of inventory drivers
- Optimized multi-echelon SKU inventory location policies
- Reduced operating cost with lowest risk inventory deployment plans

Why SAP Partner Was Selected
- Visibility into drivers of inventory and supply chain performance
- Easy-to-use solution that streamlines information gathering and validation

Low Total Cost of Ownership
- Extremely reliable solution
- Integrated into the S & OP process

Operational Benefits
- Exceeded first years inventory reduction goal by 50%
- Improved customer service levels from 93.8% to 97.5% in less than 12 months
- Improved visibility into inventory and supply chain performance drivers
- Increased throughput due to improved planning & scheduling

Wyeth is wise in the ways of health care. Its Consumer Healthcare unit produces such familiar over-the-counter brands as Advil, Centrum, Robitussin, and ChapStick. The Wyeth Consumer division is $2.7B in revenue and employs 3,100 globally.

Wyeth Consumer
- Industry: Consumer Products
- Revenue: US$2.7 billion
- Employees: 3,100
- Headquarters: Madison, New Jersey
- Web site: www.wyeth.com
- SAP partner solution: SAP’s Enterprise Inventory Optimization by SmartOps Corporation
- Implementation partner: SmartOps

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SmartOps EIO: Integral Part of HBM 3.0 Process

1. **Portfolio Planning Meeting**
   - New Items
   - SKU Rationalization
   - Lifecycle Mgmt

2. **Demand Review**
   - Item Forecast
   - Wk, Mth, Qtr, Yr
   - Total, Top 15 Customers, DC

3. **Supply Review**
   - Prod/Inv/Deploy Exceptions
   - Capacity Constraints

4. **Financial Review**
   - Financial Upsides/Risks

5. **Executive Review (BU Mtg)**
   - Strategic Direction
   - Decisions on major exceptions

SmartOps EIO Suite

Integration
Great companies leverage SAP-SmartOps to coordinate supply chain performance.
Process: Ease of Integration with SAP

- Full integrated and automated workflow
- Utilizes standard and custom SAP RFC’s, BAPI’s, BADI’s to integrate directly with SAP solutions
- Proven by SAP Developers during EBS Partnership to provide integration with SAP Solutions
- Bi-directional connector to SAP R/3, Business Warehouse and APO applications
- Loads MIPO data from the SAP instance, transaction, table and field
- Reads data from MIPO tables and updates SAP systems
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SmartOps EIO Suite
Advanced Demand Analytics
1. Comparing Historical Forecasts to Actuals

Demand Variability CV = 1.05
Forecast Error CV = 0.32

2. Outlier Detection and Exclusion

Forecast Error CV without outlier detection = 0.63
Forecast Error CV with outlier detection = 0.56

3. Bias Detection and Adjustment

Positive bias is detected and estimated at 0.63. It is often appropriate to exclude this bias from the error when determining safety stock.

4. Intermittency Detection and Adjustment

Common for SKUs in Food Service business
Identifying intermittency and accounting for timing uncertainty is essential for maintaining desired service at efficient inventory levels.
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SmartOps EIO Suite
Supply Uncertainty

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EIO accounts for supply variability in many forms. Sources of variability are modeled distinctly and not force fit into a lead time standard deviation.

- **Lead Time Standard Deviation**
  - Timing variability around a mean lead time.
  - Typically used to model replenishment times from suppliers or transit times between facilities.

- **Schedule Attainment Loss**
  - Backlog quantity created when a process does not produce to plan
  - Characterized by a mean percentage and a CV

- **Reliability**
  - Delay in delivering an order created by the periodic failure of a process requiring the process to start over again
  - Often use to model quality failure rates for the production of pharmaceutical APIs

- **Internal Service Level**
  - Backlog created when the optimization determines that internal nodes will deliver less-than-perfect service to benefit overall inventory costs
Conceptual comparison of variability handling:
Stationary demand, single stage model

$$SS = z\sqrt{\left(\sigma_D^2 LT + \mu_D^2 \sigma_{LT}^2\right)}$$

$$SS = z'\sqrt{\left(\sigma_D^2 LT + \mu_D^2 \sigma_{LT}^2\right)}$$

$$SS = z'\sqrt{\left(\sigma_{FE}^2 LT + \mu_D^2 \sigma_{LT}^2\right)}$$

$$SS = z'\sqrt{\left(\sigma_{FE}^2 \left(LT + PBR\right) + \mu_D^2 \sigma_{LT}^2\right)}$$

$$SS = z'\sqrt{\left(\sigma_{FE}^2 \left(LT' + PBR\right) + \mu_D^2 \sigma_{LT}^2\right)}$$

$$SS = \mu_S \cdot z'\sqrt{\left(\sigma_{FE}^2 \left(LT' + PBR\right) + \sigma_{DLTV}^2 + \sigma_S^2\right)}$$

$$SS = \mu_S' \cdot z'\sqrt{\left(\sigma_{FE}^2 \left(LT' + PBR\right) + \sigma_{DLTV}^2 + \sigma_S^2\right)}$$

Typical spreadsheet/textbook calculation method

$$z'$$ accounts for integration of Gamma distribution (i.e. not Normal)

$$\sigma_{FE}$$ is bias adjusted forecast error vs. demand variability

Review frequency properly included in exposure

$$LT' = f(LT, Reliability)$$

Timing Variability: $$\sigma_{DLTV} = f(LT, Reliability, \sigma_{LT}, \mu_D)$$

Quantity shortage: $$\mu_S + \sigma_S = f(Internal \ service \ level)$$

$$\mu_S' + \sigma_S' = f(Schedule \ attainment \ loss, \ Internal \ service \ level)$$

Now add time varying, multistage, batch size, etc...
Rightsizing inventory requirements requires ability to model variability pooling

Safety Stock Requirements

Traditional Methods

EIO

- Savings
- Stochastic
- Service
- Supply
- Demand
SmartOps EIO: Integral Part of HBM 3.0 Process

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SmartOps EIO Suite
Production Patterns Leveraging Batch Sizes
Production sequencing is a common planning challenge in CPG food industry.

CPG and other manufacturing companies typically have significant levels of cycle stock due to:

- large manufacturing batches
- infrequent production cycles

- Millions of dollars of working capital trapped in inventory
- Inefficient use of capacity-constrained resources

Benefits of Production Planning with Patterns Optimization

Compared to EOQ or other rule-of-thumb methods, PPPO provides:

- 10%-20% reduction in cycle inventory
- Cost-effective utilization of shared production resources with limited capacity
Determine the production frequency, sequence and quantity for a number of products across manufacturing lines while:

- Satisfying
  - Customer demand
  - Production capacity
  - Valid production pattern requirements

- Minimizing total cost
  - Setup/changeover costs
  - Inventory holding costs
  - Overtime costs
  - Fixed costs

- Typically run on a monthly or quarterly basis to:
  - Provide optimal patterns for PPDS block planning
  - Provide frequency and batch sizes to MIPO
When large batch size are present, EIO leverages them to reduce safety stock.

EIO enables items with large batch or lot sizes to reduce the need for safety stock while maintaining service objectives.

SmartOps approach:
Identify item where the cycle stock is high due to batch sizes that exceed the forecasted demand and reduce the associated SS

Benefit:
Reduced total OH inventory required to meet the desired service level
SmartOps EIO: Integral Part of HBM 3.0 Process

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SmartOps EIO Suite
Multistage Optimization
Service Level Optimization

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Single stage calculations result in planning “silos” and a supply chain with excess inventory. Multistage optimization eliminates the silo effect and plans all stages simultaneously.

Traditional Methods

Stage
3
2
1

Single Stage Calculations: Isolated planning results in over-buffering of inventory throughout the supply chain

SmartOps

Multistage Optimization: Coordinated planning eliminates over-buffering of inventory and builds confidence in internal service level
EIO Optimization of Internal Service Levels

- Multi-stage logic evaluates the inventory cost of different internal level service combinations
- Proprietary algorithms to search through the possible internal service levels for the combination resulting in lowest inventory cost

![Graph showing total SS holding cost vs. safety stock cost for different internal service level combinations]
SmartOps’ Service Level Optimization module (SLO) is designed:
- to determine the right *item-location-specific* service targets
- to minimize inventory investment and lost margin
- while meeting a global service objective

SLO evaluates the true cost drivers with its EIO backbone:
- Product volume
- Product cost
- Demand and supply variability
- Batch and lot sizes
- Coordinated multistage inventory planning
- Trades off lost margin versus holding cost

**Service Level Optimization has provided:**

- an additional 5-10% on hand inventory reduction on top of EIO
- better understanding and decision-making capability around the trade off between service and inventory
Model Scope:
• 31 Finished Goods
• 3 Distribution Centers
• Global Service Objective of 98% Unit Fill Rate

Results:
• Additional 12% safety stock reduction (6.4% on hand reduction) on top of EIO

Recommended Service Level Target Changes by Stocking Point
SmartOps EIO: Integral Part of HBM 3.0 Process

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SmartOps EIO Suite
Exception Management
Root Cause Understanding
What-if Analysis

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Typical Supply Planner Workflow

Setting the stage:
Monthly S&OP process

Behind the scenes:
Forecast updated
Inventory model data refreshed
Transaction data refreshed for supply and demand uncertainty

Planner’s workflow:
Review alerts
View exception reports
Validate results
Collaborate with peers
Make updates, if necessary
Release targets for use
Typical Supply Chain Analyst Workflow

Setting the stage:
S&OP Supply Variability What-if

Behind the scenes:
New process may increase the attainment loss on the production of bulk and a new packaging supplier increases the risk of lead time deviations.

Analyst’s process:
Create scenarios
Optimize scenarios
Review results
Issue recommendation
### What makes EIO Different?

#### Competitive Comparison

<table>
<thead>
<tr>
<th>Inventory Planning Elements</th>
<th>Manu IPO</th>
<th>IBM ILOG</th>
<th>SmartOps EIO</th>
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<tbody>
<tr>
<td>Proven SAP data integration</td>
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<tr>
<td>Inventory policy at S&amp;OP cadence</td>
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<td>Demand variability</td>
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<td>Supply variability</td>
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<tr>
<td>Production attainment/reliability</td>
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<td>Variability pooling (stochastic)</td>
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<td>Batch size vs. demand</td>
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<td>Multi-stage optimization</td>
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<td>Service levels</td>
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<tr>
<td>Exception Management/Root Cause</td>
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<tr>
<td>Scenario analysis</td>
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</table>
SmartOps people, implementation process and integration technology provides **highest value, lowest risk, and lowest total cost** to CPG Organization

**Keys to successful implementation of EIO**

1. Experienced Professional Services Organization (PSO)
2. Robust Implementation Methodology
3. Proven Integration Technology
4. Ongoing Value Management
5. Consumer Products Industry Knowledge
CPG Organization Supply Chain & Implementation Options
SmartOps Implementation Process

Early in the SmartStep process, the team will analyze the business needs to determine the best rollout schedule to provide tangible value early in the implementation.

SmartSteps’ Rollout Priority Matrix

Examples of Potential Rollouts

<table>
<thead>
<tr>
<th>Wave 1</th>
<th>Wave 2</th>
<th>Wave 3</th>
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<tbody>
<tr>
<td>Division #1</td>
<td>Division #2</td>
<td>Division #3</td>
</tr>
<tr>
<td>Attended – SC1</td>
<td>Attended – SC 2-4</td>
<td>Unattended - All</td>
</tr>
<tr>
<td>Planner Group A</td>
<td>Planner Group B</td>
<td>All</td>
</tr>
</tbody>
</table>

Value

Current Inventory Levels
Current Stockout Levels

Implementation Difficulty

Data Quality
Base Product Fit
Resource Availability
$12B Consumer Packaged Goods company

Business Challenges

- Supply chain complexity driven by multiple inventory stocking locations
- Various production processes with unique constraints
- Considerable supply and demand uncertainty
- High, differentiated customer service requirements
- Integrated SAP SCM suite with SAP R/3, BW, APO & SmartOps MIPO

Benefits Realized

- 20% total inventory reduction across the four business units with stable customer service levels
- Less than six months from contract signature to ‘Go Live’ and achieving value while also performing APO rollout

“The SmartOps inventory optimization solution fits well in our SAP environment and supports our strategy to drive supply chain efficiencies during the next three years. This will allow us to continue to enhance our supply chain planning and improve our ability to meet customer needs.”

Bob Masching,
VP, Sales and Operations Planning
Integration with SAP
Possible EIO Integration Workflows

- SAP Environment R/3, APO
- Other Systems
- ETL Tools
- SmartOps Data Loading Tools
- Web User Interface
- Data Gateway
  - Demand Intelligence Module
  - Supply Intelligence Module
  - Production Intelligence Module
  - Service Level Optimization
- Data Store
  - Business Intelligence Applications
- Multistage Inventory Planning & Optimization
## SmartOps Common Data Inputs

<table>
<thead>
<tr>
<th>Entity</th>
<th>Common Source</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>ERP</td>
<td>Master data</td>
</tr>
<tr>
<td>Location</td>
<td>ERP</td>
<td>Master data</td>
</tr>
<tr>
<td>Bill of Materials</td>
<td>ERP</td>
<td>Applicable in manufacturing/packaging</td>
</tr>
<tr>
<td>Sourcing</td>
<td>Supply Planning</td>
<td>Source-Destination relationships for stock transfers and purchase</td>
</tr>
<tr>
<td>Forecast</td>
<td>Demand Planning</td>
<td>Both historical and future for both analysis and planning</td>
</tr>
<tr>
<td>Sales</td>
<td>Demand Planning/Data Warehouse</td>
<td>Used to determine forecast error metrics</td>
</tr>
<tr>
<td>Item/Location Data</td>
<td>ERP</td>
<td>SKU level inputs such as order multiples and attributes</td>
</tr>
<tr>
<td>PO/Receipt Data</td>
<td>ERP</td>
<td>Used to determine lead time variability</td>
</tr>
<tr>
<td>Data Set Definition</td>
<td>Static Data</td>
<td>SmartOps specific parameters</td>
</tr>
<tr>
<td>Module Setting</td>
<td>Static Data</td>
<td>Define key parameters for SmartOps processor modules</td>
</tr>
</tbody>
</table>
# SmartOps Project Roles

<table>
<thead>
<tr>
<th>ROLE</th>
<th>DUTIES</th>
<th>PROJECT DELIVERABLES</th>
<th>BACKGROUND</th>
</tr>
</thead>
</table>
| **Project Manager – SmartOps** | ● Coordination of SmartOps resources, tasks, and deliverables  
● Financial responsibilities for commercials including budget development and tracking, and resource utilization and billing management  
● Manages risks, issues and overall project deliverables  
● Facilitates discovery sessions for requirements gathering  
● Actively participates in generation of overall deliverables | ● Project Charter (Owner)  
● Solution Definition Document (Contributor)  
● Batch Process Design Document (Contributor)  
● User Acceptance Test (Owner)  
● Core Team Training (Owner) | ● 5-plus years of software / process consulting/implementation experience  
● Minimum Bachelors degree in Business or Computer Science, or related field  
● Strong ability to lead and motivate a cross-functional team in a matrix environment  
● Ability to successfully deliver ‘custom solutions’ while using a standard implementation methodology  
● Practical knowledge of supply chain operations and processes |
| **Supply Chain Consultant – SmartOps** | ● Partners with customer to build the models within the SmartOps solution to defined customer business requirements  
● Supports data input and integration process  
● Responsible for documenting client technical requirements  
● Provides coaching on best practices for modeling, change management, and integration  
● Responsible for capturing and documenting business user requirements | ● Project Charter (Contributor)  
● Solution Definition Document (Owner)  
● Batch Process Design Document (Owner)  
● User Acceptance Test (Contributor)  
● Core Team Training (Contributor) | ● 5-plus years experience implementing supply chain, ERP, or related enterprise solution of software / process consulting/implementation experience  
● Bachelors degree or higher in Computer Science or related IT field  
● Strong ability to manipulate and transform large volumes of data  
● Practical knowledge of supply chain operations and processes |
| **Support Services Engineer – SmartOps** | ● Collaboration with customer resources for the technical installation and support of understanding hardware and software elements – sizing and scalability definition  
● Provides customer requested technical services – DBA and system administration support  
● Prepares customer specific documents and training when required  
● Post implementation support (upgrades, expansion, etc.) | ● Application Parameters Document (Contributor)  
● Software Environment Sizing and Setup (Owner) | ● 5-plus years experience in specific area of responsibility  
● Bachelors degree or higher in computer science or related field  
● Strong technical understanding and practical functional understanding of SmartOps application |
<table>
<thead>
<tr>
<th>ROLE</th>
<th>DUTIES</th>
<th>PROJECT DELIVERABLES</th>
<th>BACKGROUND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algorithm Engineer – SmartOps</td>
<td>• Modeling review and quality assurance</td>
<td>• Solution Definition Document (Contributor)</td>
<td>• PhD in Operations Research or related field</td>
</tr>
<tr>
<td></td>
<td>• Trains customer team on SmartOps algorithms</td>
<td>• User Acceptance Test (Contributor)</td>
<td>• Deep knowledge of SmartOps algorithms</td>
</tr>
<tr>
<td></td>
<td>• Assists with modeling approach for any unique situations</td>
<td>• Core Team Training (Contributor)</td>
<td>• Practical knowledge of supply chain operations and processes</td>
</tr>
<tr>
<td>Steering Team Members - SmartOps</td>
<td>• Participates in SmartOps deliverable review sessions</td>
<td></td>
<td>• 10-plus years experience implementing supply chain, ERP, or related enterprise solution of software / process consulting/implementation experience</td>
</tr>
<tr>
<td></td>
<td>• Members of SmartOps management teams</td>
<td></td>
<td>• Extensive knowledge of supply chain operations and processes</td>
</tr>
<tr>
<td></td>
<td>• Maintains relationship with customer senior leadership</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Role</td>
<td>General Responsibilities</td>
<td></td>
<td></td>
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</tbody>
</table>
| **Steering Team Members**            | Executives and business unit managers assigned to represent the project throughout the corporation  
Provide oversight and direction to the project team  
Path of escalation for issues                                                                 |
| **Project Lead**                     | Leads the project and acts as the prime contact for SmartOps  
Coordination of customer project resources  
Actively participates in project planning and deliverables development  
Manages budget and timeline, issues and risks                                                                 |
| **Planning and Operations Subject Matter Experts** | Primary users of the processes and reports enabled by the SmartOps software  
Operations resources who are responsible for the daily execution of the Customer supply chain  
Provides input on Customer business practices and supply chain policies  
Assist in the translation of Customer operational and business requirements into SmartOps specific supply chain model and data input requirements/settings  
Assist in the analysis and validation of SmartOps modeling input/output data |
| **Master Data Specialists**          | Customer and product master data expertise and support  
Planning and/or IT resources who have access and knowledge of the required supply chain master and transaction data within the customer information systems and repositories. |
| **IT Staff**                         | SAP System expertise and support  
Hardware procurement and configuration  
Database administration  
Interface Development  
Security |
To summarize our understanding of the implementation at CPG Organization:

• **Approach:**
  – Align with Keystone project timeline and scope
  – Managed globally from Pittsburgh, PA
  – Automated interfaces to SAP (single, global instance)
  – Tight collaboration between organizations – leverage our proximity
  – Develop capability to allow CPG Organization to own the process after initial implementation

• **Estimates:**
  – Duration: 5-6 Months, but contingent on Keystone
  – SmartOps Effort: 140-170 days or approx. $250-$300K
Value of Enterprise Inventory Optimization at CPG Organization

**Key Functional Differentiators**

- Enterprise Inventory Optimization (EIO) provides a full end-to-end, multistage inventory optimization from raw to finished goods.
- EIO was designed to be an enterprise class solution that is integrated with best practice planning processes.
- EIO was designed with the CPG industry in mind and handles many unique challenges in CPG such as seasonality, forecast bias and intermittent demand.
- Service Level Optimization enables proper deployment of inventory to maximize the benefits of profitable service.

**Reduce Risk**

- EIO is the leader in inventory optimization and has co-innovated best practices with leading CPG companies such as ConAgra, Kellogg’s and Sysco.
- EIO has been certified and is fully supported to enhance APO. No other technology has the level of testing and support when used in an SAP environment in this space.
- The integration of EIO into the SAP ERP and SCM environment has been proven time and again.
- Single point of contact for Support

**Partner for Supply Chain Leadership**

- Access to consistent product innovation driven by SmartOps User Group and staff of supply chain researchers and professionals.
- Comprehensive training programs available during implementation and for ongoing education.
- Local presence

**Realize Value**

- Maximize value of SAP ECC and SCM investment.
- Proven track record of value realization and innovation.
- Significant Tangible Benefits:
  - Improved Customer Service (On time Delivery)
  - Reduced Inventory (Finished Goods, WIP and Raw Material)
  - Reduced Supply Chain Costs (Carrying Cost, Obsolescence, Transportation, and Planner Productivity)