

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.

Thursday April 8, 2010
Pirates vs. Dodgers



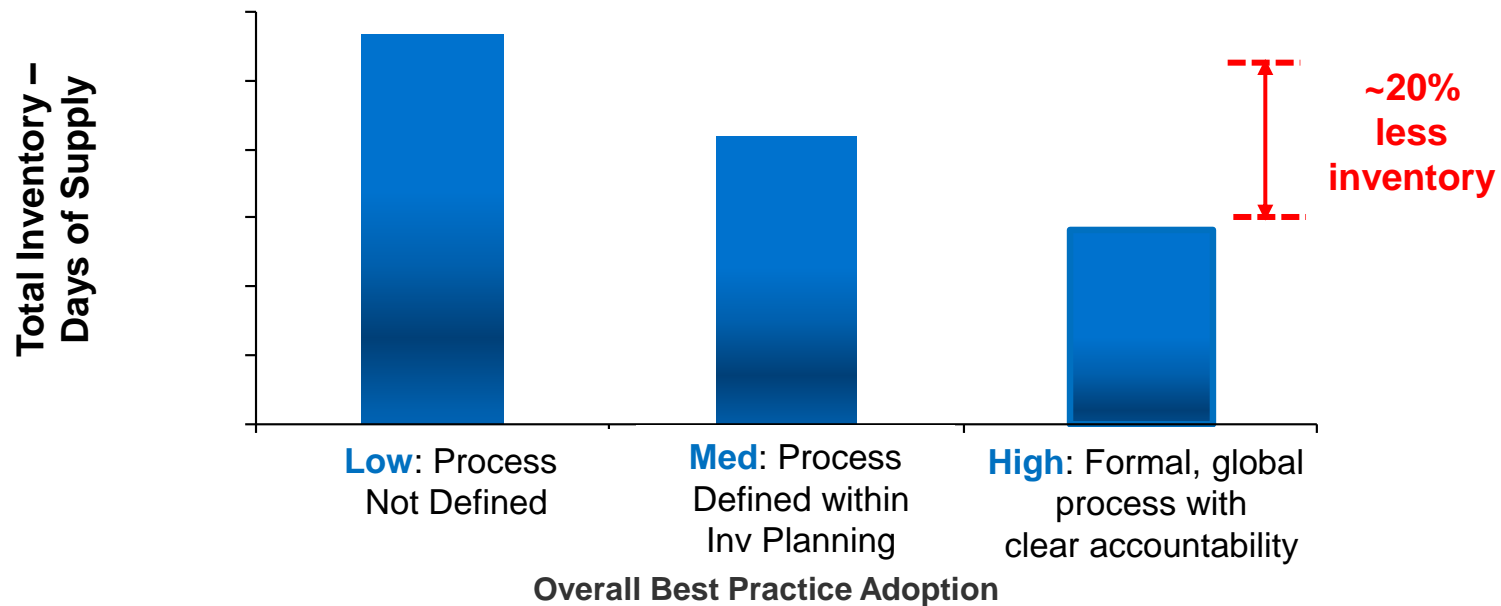
	1	2	3	4	5	6	7	8	9		R
LA Dodgers											
Pittsburgh											

Inventory Planning is a lot like Baseball

Baseball	Inventory Planning	
What's the score?	How much do I need?	Quantity over time, Periods of Cover

SAP Benchmarking Confirms Inventory Reduction Opportunity

Inventory Levels vs. Maturity of Safety Stock Processes



Best Practice:

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

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**

SmartOps®

Solution Extension
Partner

(May 2009)

Endorsed Business
Solution Partner

(2006)

Industry Value
Network Partner

(2006)



SAP NetWeaver,
xApp Certification

(2005)

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

	Traditional	SmartOps®
Scope	Single stage, single time period	Multi-stage, time phased
Data	Poor data quality and limited insight into inventory drivers	Data Confidence and analysis into what drives inventory
Technology	“Rule of thumb” or Deterministic	Stochastic – understands impact of variability
Process	Infrequent changes to inventory policy	Adapts inventory strategy as supply chain changes

How Inventory Optimization Complements SAP

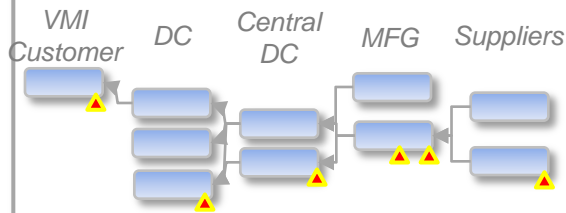
Supply Chain Challenges

... more layered, multi-tier supply chains

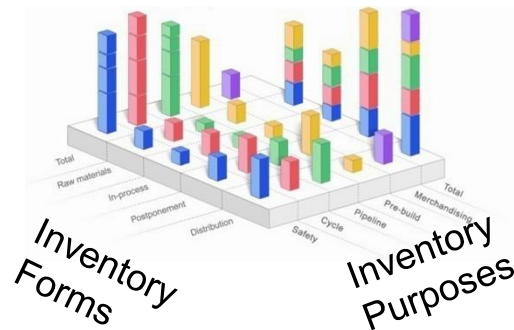
... more frequent product launches

... increasing customer service expectations

Multi-echelon Safety Stock



Inventory Segmentation



Service Level Optimization

Basic
A,B,C
Segmentation



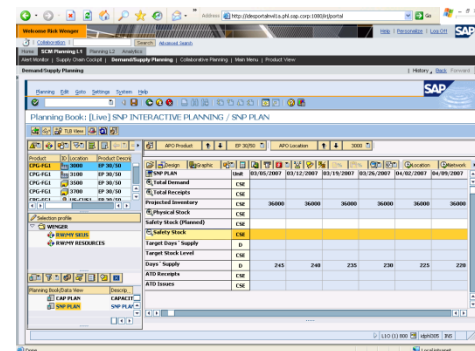
Optimal
Service
Level for
Every
Product,
Location
Combination

Enterprise Inventory Optimization

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

Inventory
Policies

SAP SCM & SAP ERP



SmartOps' data model considers supply chain complexities

Master Data

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

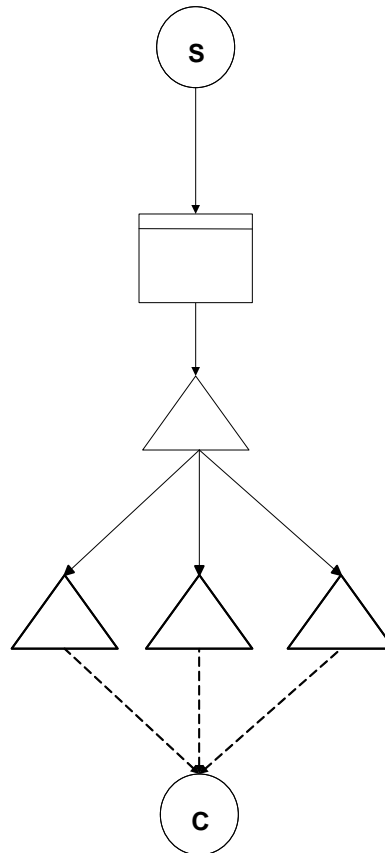
Replenishment Planning Data

- **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*

Manufacturing / Process Data

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

Comprehensive data model



Uncertainty Data

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

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*

Bold = Basic input

Italics = Additional input

Optimal inventory targets calculated by SmartOps sent to
SAP Supply Network Planning (SNP)

Planning Edit Goto Settings System Help

Planning Book: [Live] MNPE SUPPLY PLANNING / SNP PLAN

TLB View

Selected Objects

Product	Type	Location	Product Description
HT-Note1		ML-PL1	HT-Notebook1
HT-Note1		ML-PL2	HT-Notebook1
HT-Note1		ML-DC1	HT-Notebook1
HT-Note2		ML-DC1	HT-Notebook2

Selection profile

SIMONSON

MNPE-PROD

Planning Book/Data View Description

MNPE-SNP

SUPPLY PLANNI SNP PLAN

APO Product HT-Note1 APO - Location ML-DC1

	Unit	4/17/201..	4/18/201..	4/19/201..	4/20/201..	4/21/201..	4/22/201..
SNP PLAN							
Forecast	CSE	35	35	35	35	30	30
Sales Order	CSE	10	40	30	50	10	5
Distribution Demand (Planned)	CSE						
Dependent Demand	CSE						
Total Demand	CSE	10	40	30	50	10	5
Distribution Receipt (Planned)	CSE			150			
Production (Planned)	CSE						
Total Receipts	CSE			150			
Projected Inventory	CSE	310	270	390	340	330	335
Physical Stock	CSE						
Reorder Point	CSE	250	250	250	250	250	250
Safety Stock	CSE	100	100	100	100	100	100
Days' Supply	D						

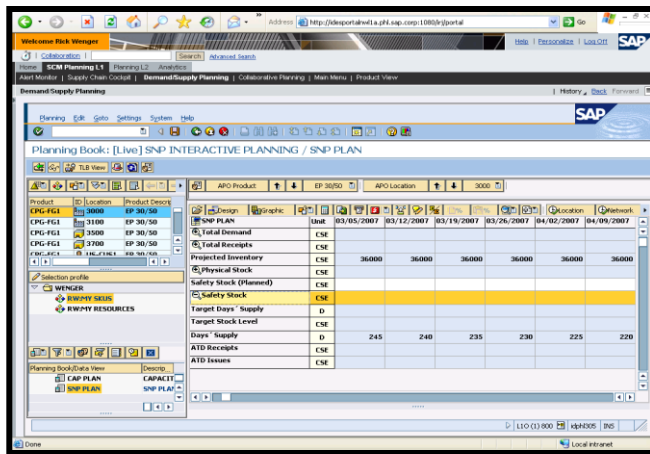
Optimal inventory targets calculated by SmartOps sent to SAP Supply Network Planning (SNP)

DHO (1) 800 dhotdc00 OVR

Dynamically position and optimize inventory in multi-tier manufacturing & distribution supply chains with SAP Enterprise Inventory Optimization

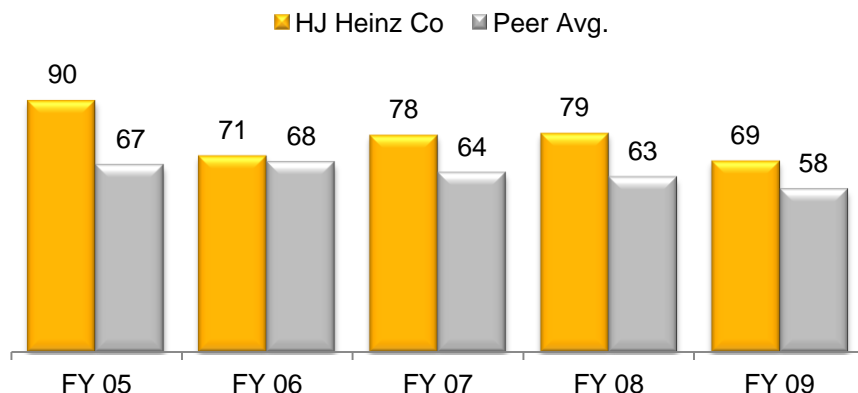
Key Capabilities Offered

- 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?

Days in Inventory (DII)



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. $DII = (Inventory/COGS) * 365$
- 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
- Peer Group includes: HJ CPG Organization, General Mills, Hershey, Kraft Foods, Smithfield Foods, Campbell Soup.

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

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

“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.

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



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

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.

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

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

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



Wyeth Transforms Inventory Management with SAP's Enterprise Inventory Optimization

QUICK FACTS

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

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

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

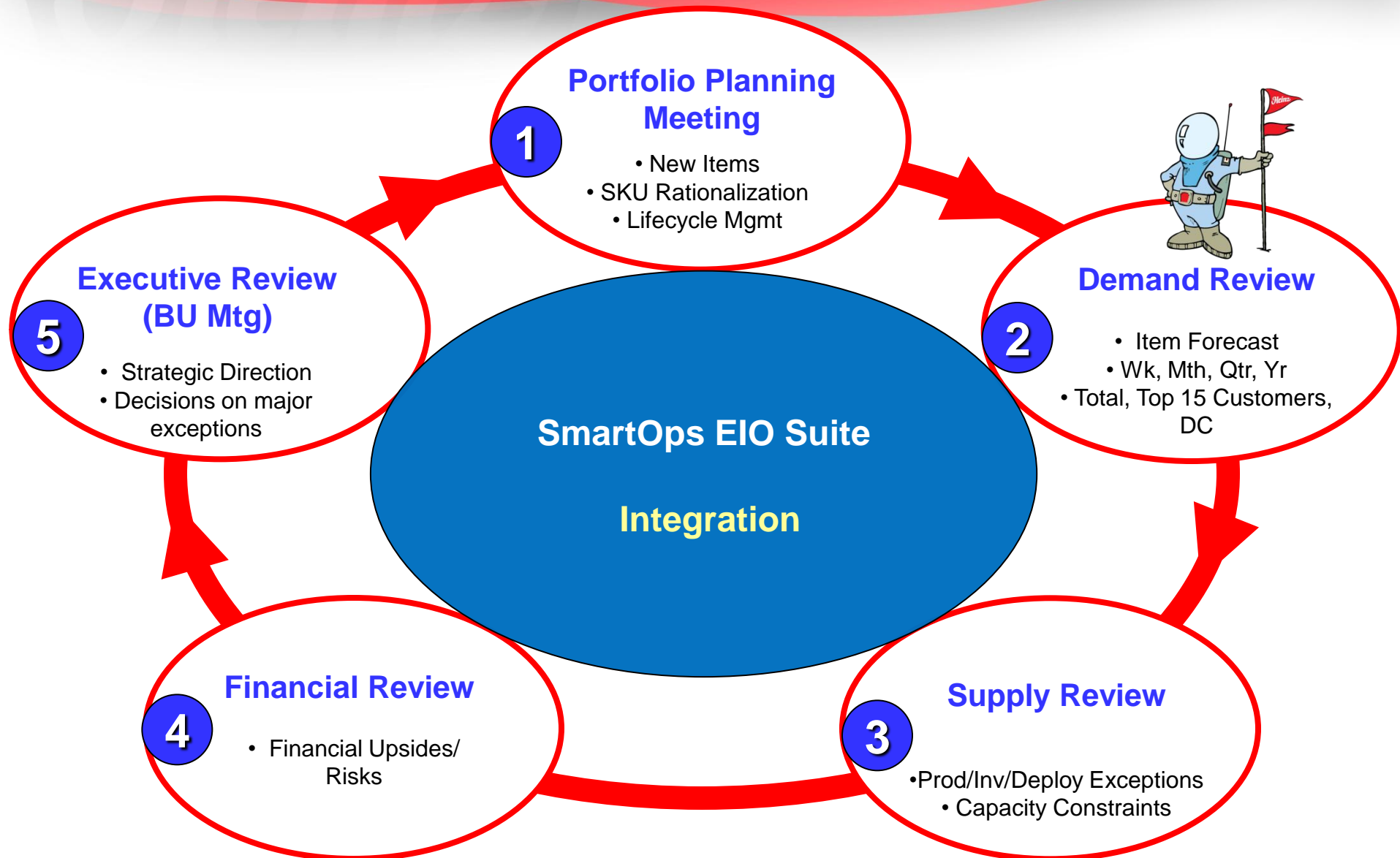
Low Total Cost of Ownership

- 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

SmartOps EIO: Integral Part of HBM 3.0 Process



Great companies leverage SAP-SmartOps
to coordinate supply chain performance

Chemicals

EASTMAN



High Tech

LEXMARK



CPG



ESTÉE
LAUDER
COMPANIES



DIAGEO



Life Sciences

Johnson & Johnson

Wyeth
Consumer Healthcare

Wyeth
Pharmaceuticals

Manufacturing



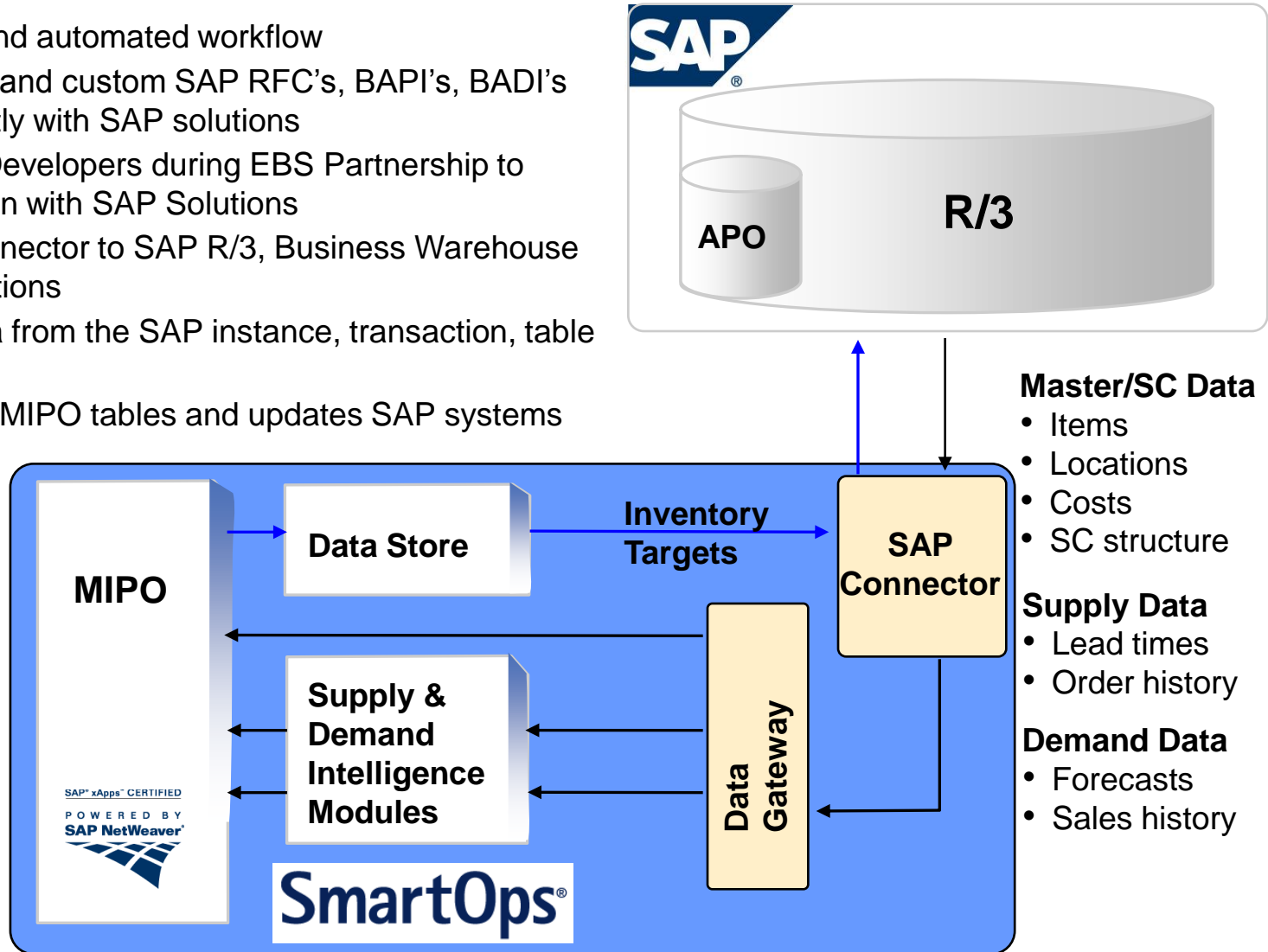
KOHLER.

Distribution / Retail

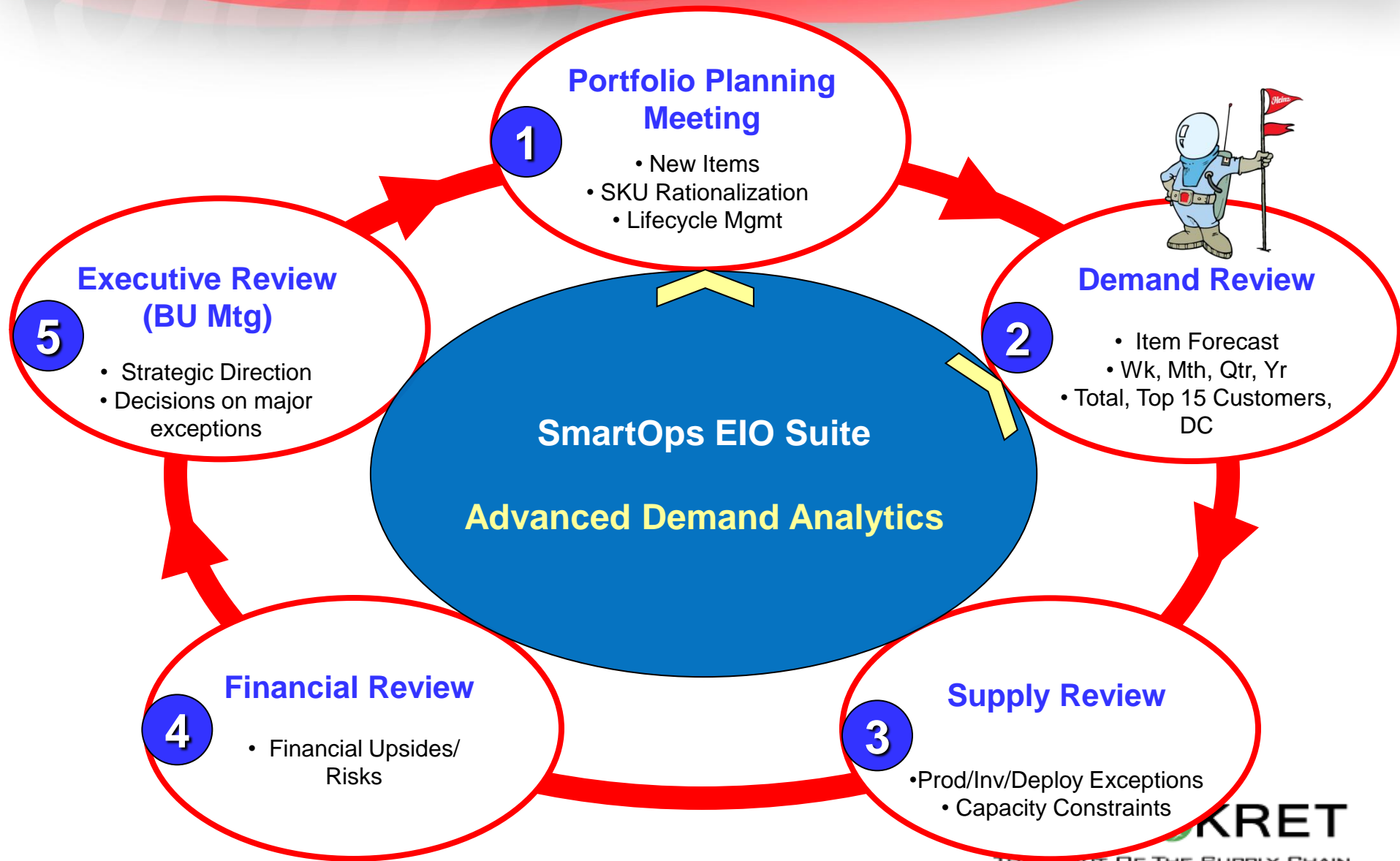


Process: Ease of Integration with SAP

- 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

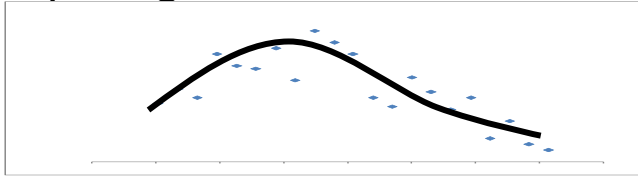


SmartOps EIO: Integral Part of HBM 3.0 Process



Best practice demand analytics: Uncertainty that is relevant to inventory planners

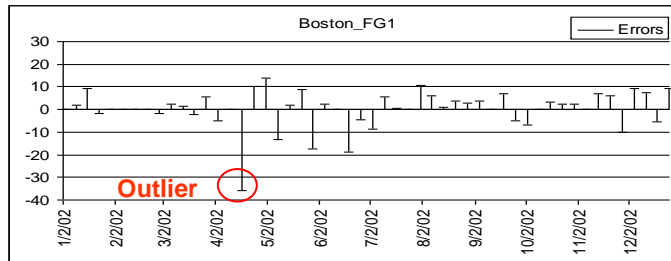
1. Comparing Historical Forecasts to Actuals



Demand Variability CV = 1.05

Forecast Error CV = 0.32

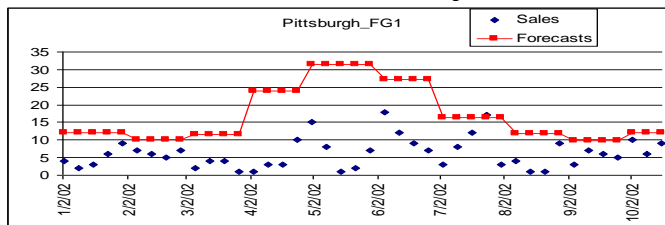
2. Outlier Detection and Exclusion



Forecast Error CV without
outlier detection = 0.63

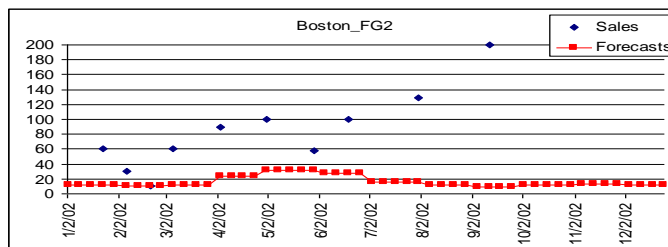
Forecast Error CV with outlier
detection = 0.56

3. Bias Detection and Adjustment



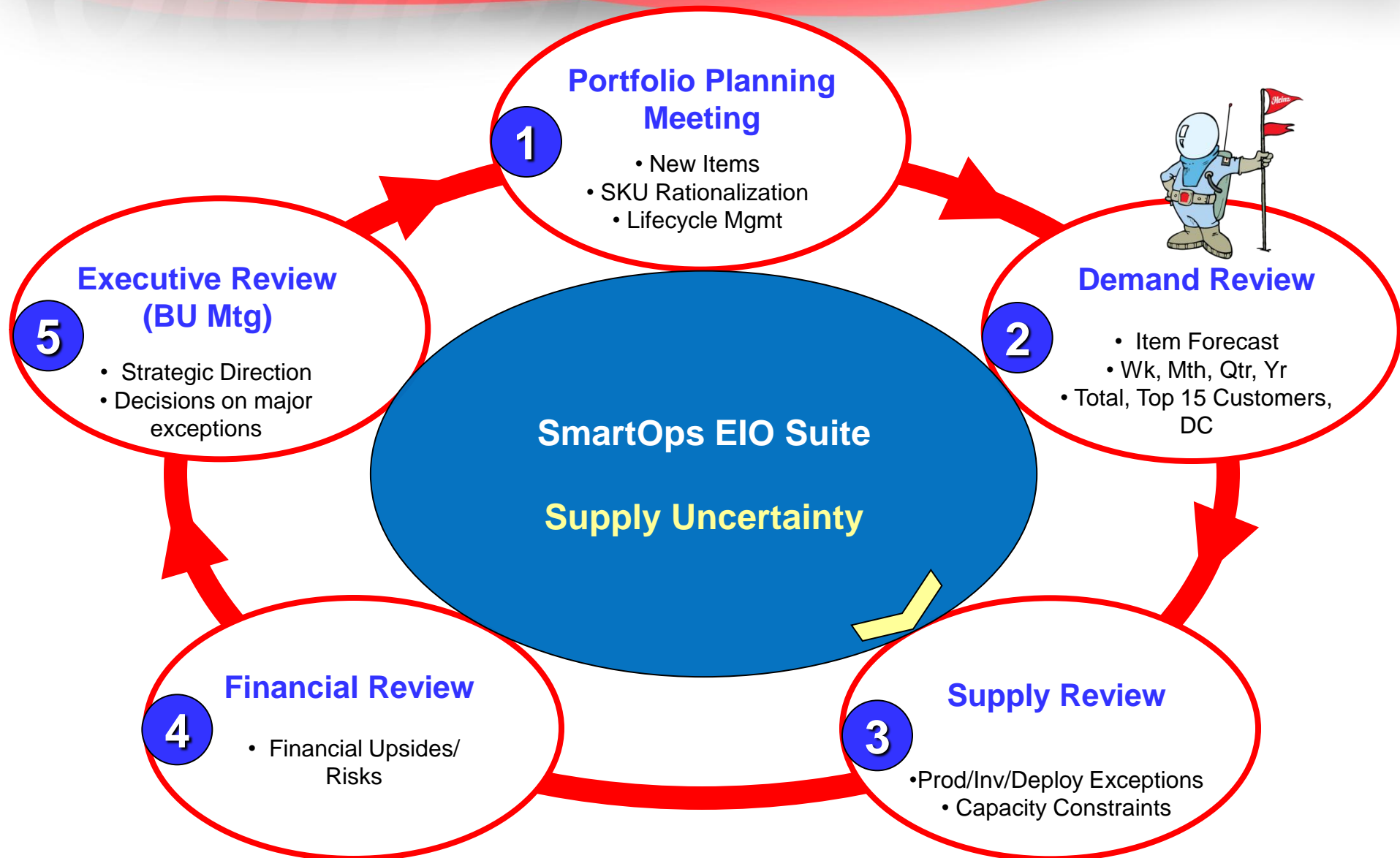
Positive bias is detected and estimated at 0.63. It is often appropriate to exclude this bias from the error when determining safety stock.

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.

SmartOps EIO: Integral Part of HBM 3.0 Process



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

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

Typical spreadsheet/textbook calculation method

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

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

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

σ_{FE} is bias adjusted forecast error vs. demand variability

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

Review frequency properly included in exposure

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

$LT' = f(LT, \text{Reliability})$

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

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

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

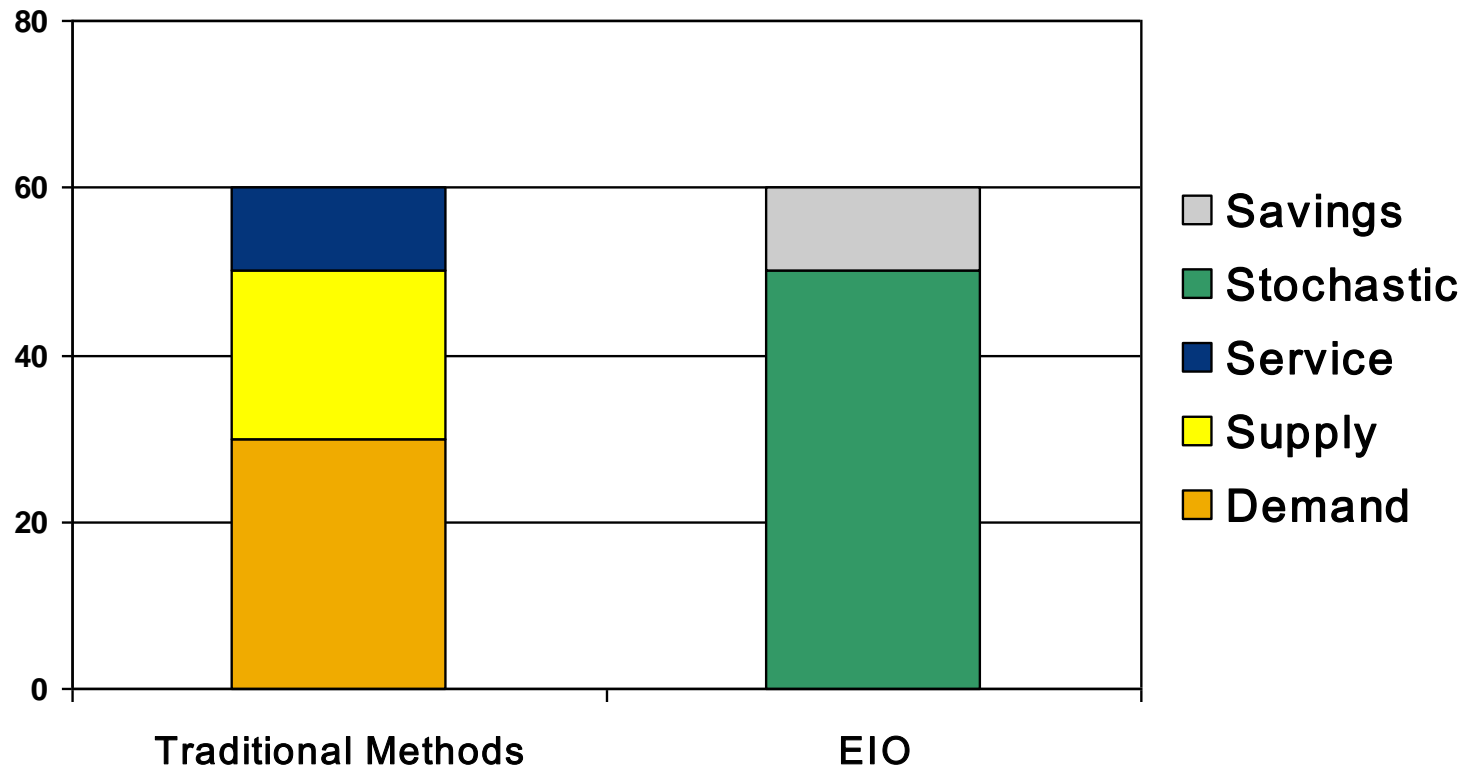
Quantity shortage: $\mu_S + \sigma_S = f(\text{Internal service level})$

$$SS = \mu_{S'} + z' \sqrt{(\sigma_{FE}^2 (LT' + PBR) + \sigma_{DLTV}^2 + \sigma_{S'}^2)} \quad \mu_{S'} + \sigma_{S'} = f(\text{Schedule attainment loss, Internal service level})$$

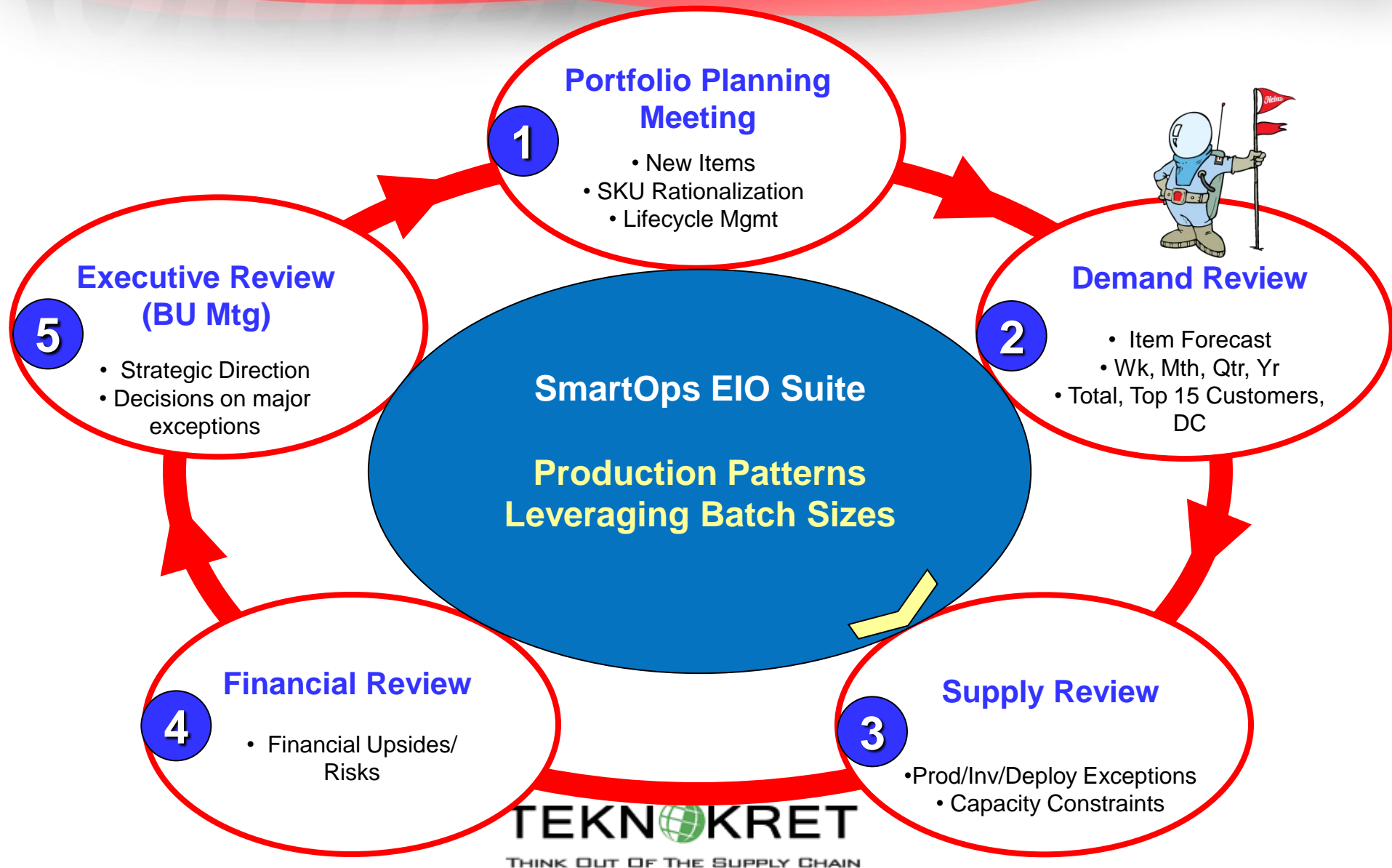
Now add time varying, multistage, batch size, etc...

Rightsizing inventory requirements requires ability to model variability pooling

Safety Stock Requirements



SmartOps EIO: Integral Part of HBM 3.0 Process



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:

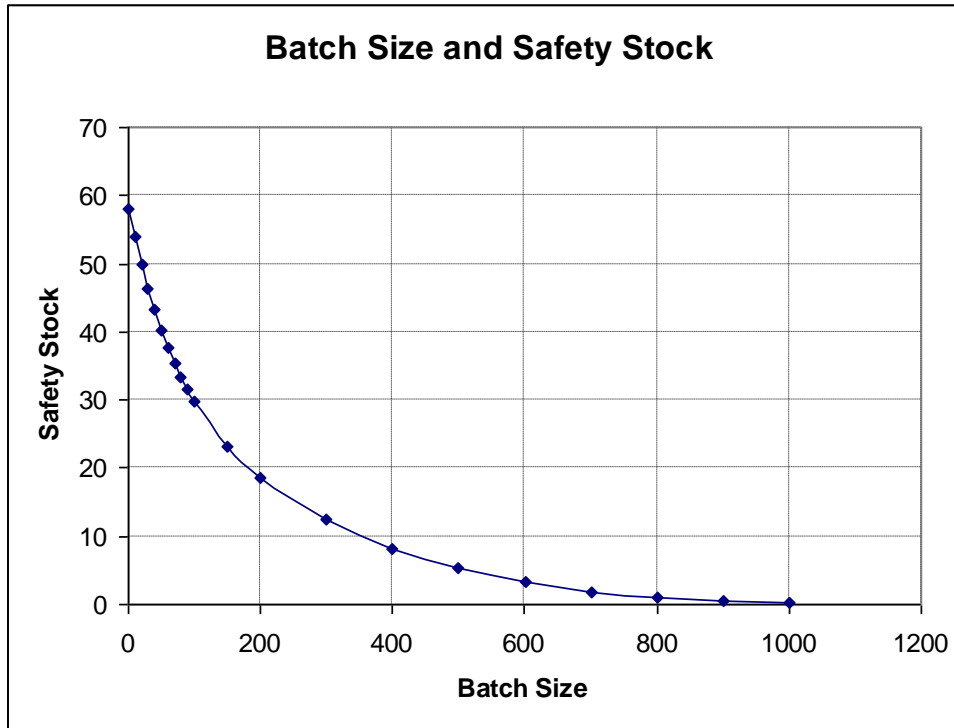
- 10%-20% reduction in cycle inventory
- Cost-effective utilization of shared production resources with limited capacity

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

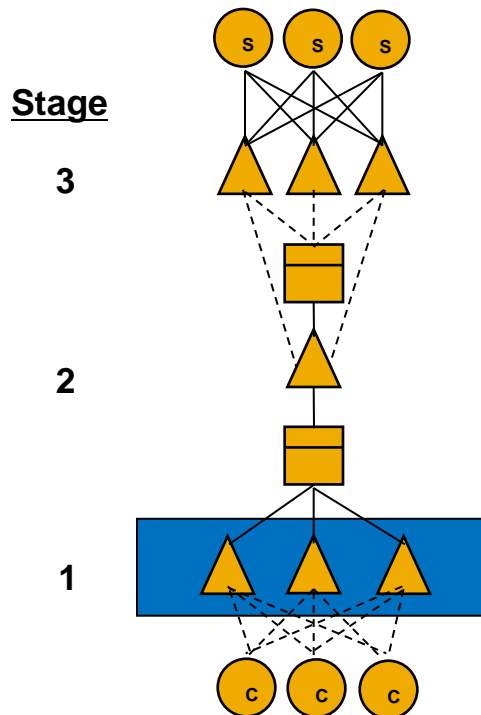
SmartOps EIO: Integral Part of HBM 3.0 Process



Multistage optimization allows risk to be shared across stages of the supply chain

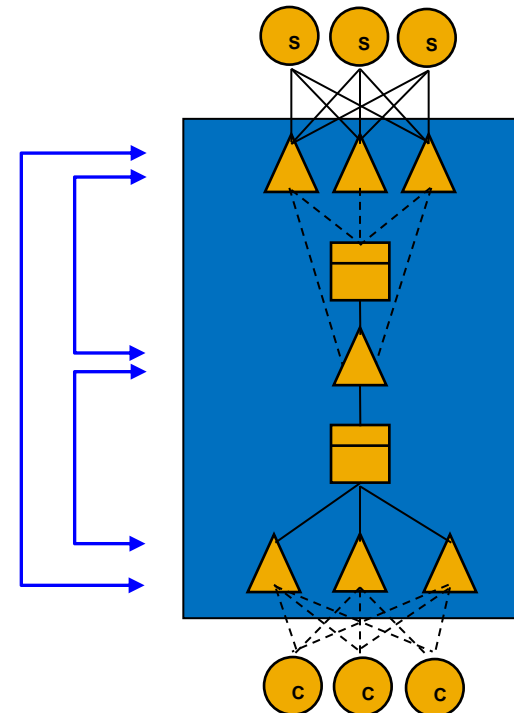
Single stage calculations result in planning “silos” and a supply chain with excess inventory.
Multistage optimization eliminates the silo effect and plans all stages simultaneously.

Traditional Methods



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

SmartOps®

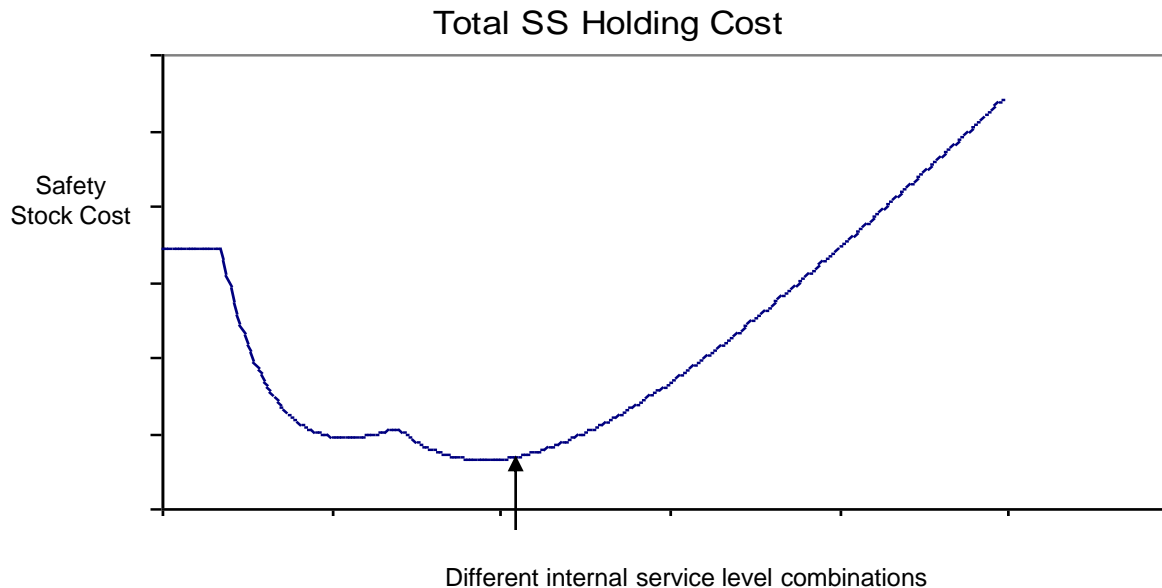


Multistage Optimization:
Coordinated planning eliminates over-buffering of inventory and builds confidence in internal service level

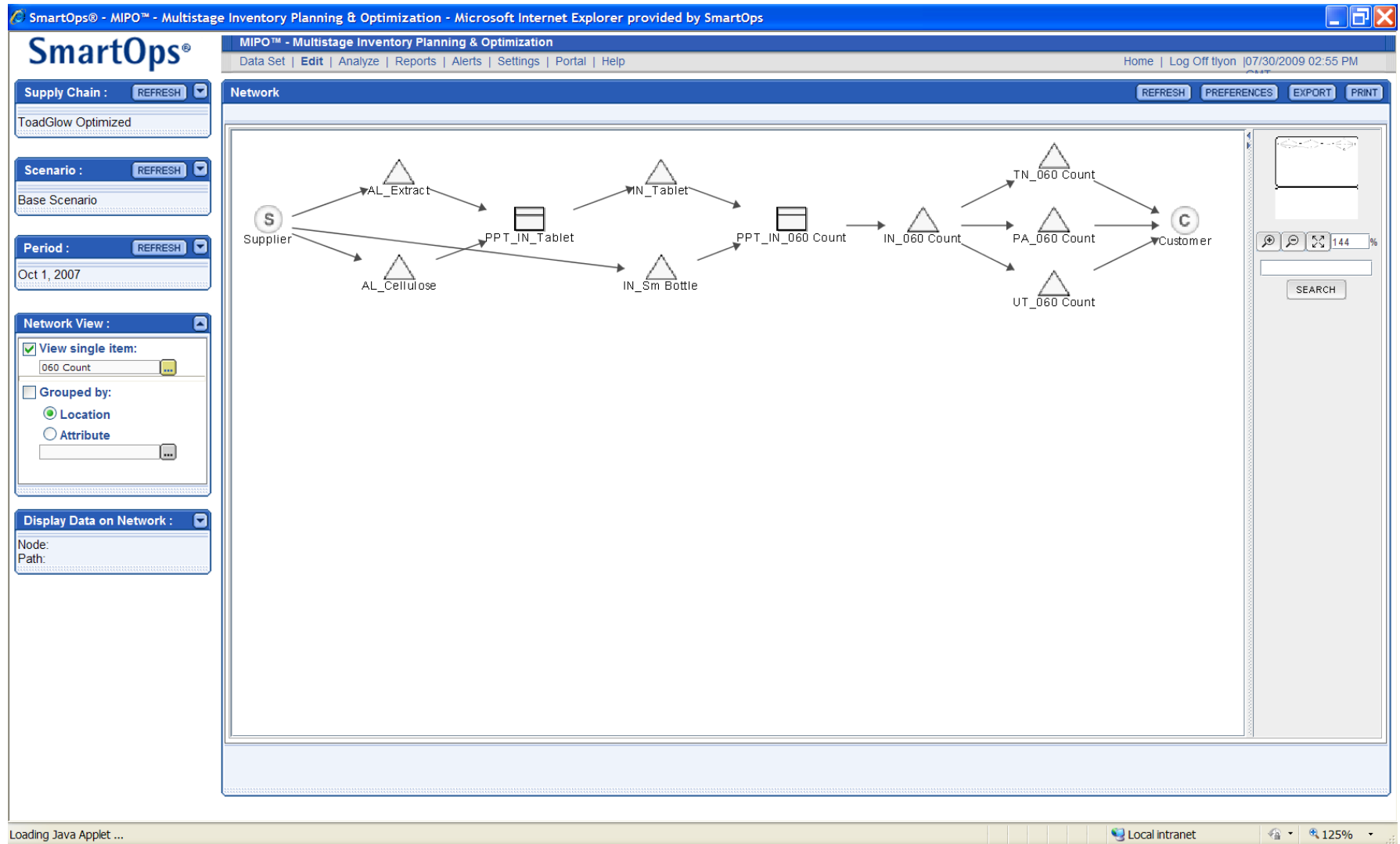
Multistage optimization coordinates targets from raw materials through finished goods

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



Supply Chain Model in EIO



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

Consumer Goods SLO Results

Minimize Total Inventory Costs Only

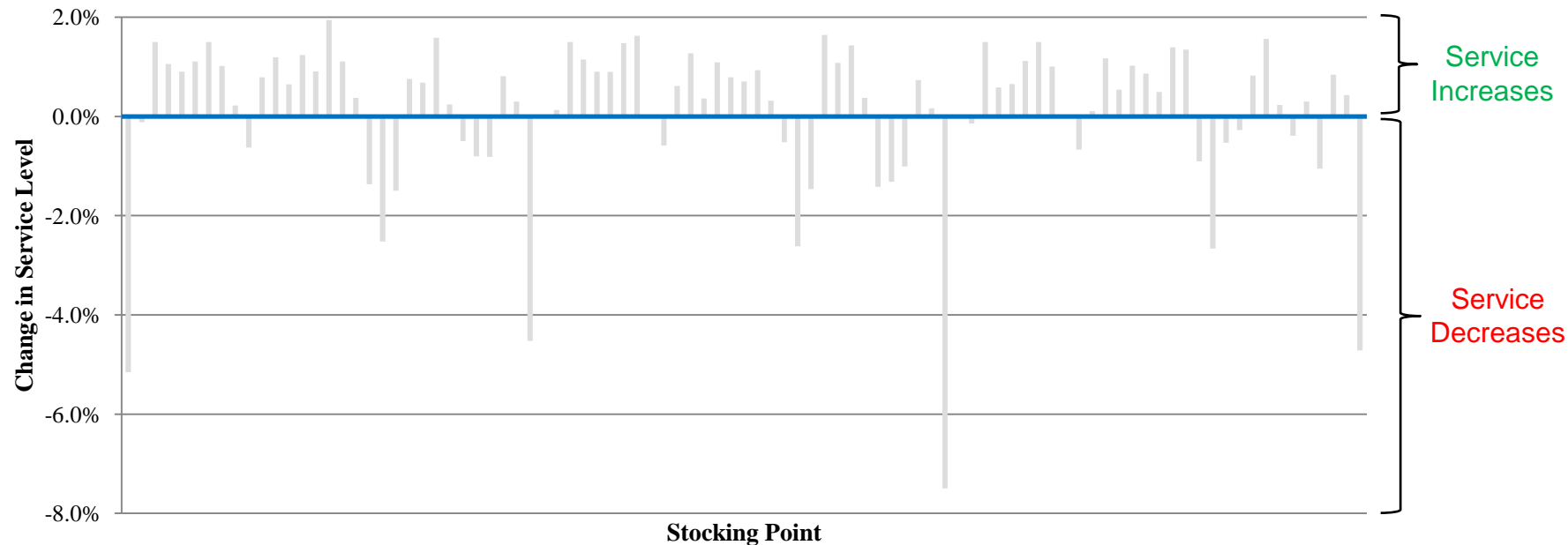
Model Scope:

- 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



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

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

Inventory Planning Elements	Inventory Planning Capabilities		
	Manu IPO	IBM ILOG	SmartOps EIO
Proven SAP data integration			
Inventory policy at S&OP cadence			
Demand variability			
Supply variability			
Production attainment/reliability			
Variability pooling (stochastic)			
Batch size vs. demand			
Multi-stage optimization			
Service levels			
Exception Management/Root Cause			
Scenario analysis			

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

Mobilize		Design		Configure		Validate		Deploy
Project Management		Project Management		Project Management		Project Management		Project Management
<ul style="list-style-type: none"> ♦ Project Mgt Office ♦ Kick-off Meetings ♦ Sandbox environment creation ♦ Core Team Training ♦ IT Assessment ♦ Define high-level Use Case(s) & Deployment Strategy ♦ Data Source Matrix ♦ Project Charter ♦ Identify KPIs ♦ Identify Org. Impacts ♦ SmartOps Phase Review 	<ul style="list-style-type: none"> ♦ Solution Definition Document (SDD) ♦ Baseline KPI tracking ♦ Develop Org. Impact Plan ♦ SmartOps Phase Review ♦ Steering Committee Update 	<ul style="list-style-type: none"> ♦ Gather/Cleanse/Validate Data inputs ♦ Application Parameters Document (APD) ♦ Production/Test Environment Creation ♦ Ongoing KPI tracking ♦ SmartOps Phase Review 	<ul style="list-style-type: none"> ♦ Users Acceptance Test (UAT) <ul style="list-style-type: none"> ♦ Issue resolution ♦ Ongoing KPI tracking ♦ SmartOps Phase Review ♦ Steering Committee Update 	<ul style="list-style-type: none"> ♦ Integration Acceptance Test (IAT) <ul style="list-style-type: none"> ♦ Issue Resolution ♦ Define IT cutover plan ♦ Performance Tuning & Testing 	<ul style="list-style-type: none"> ♦ Training - end user / train-the-trainer, Executive ♦ Ongoing KPI tracking ♦ Transition to Customer Support Migrate to Final Production Environment ♦ SmartOps Phase Review ♦ Final Steering Committee Update 	<ul style="list-style-type: none"> ♦ Execute automated system and data cutover 	<ul style="list-style-type: none"> ♦ Custom Acceptance Test (CAT) ♦ Detailed output analysis 	<ul style="list-style-type: none"> ♦ Operational Support ♦ Additional Services
<ul style="list-style-type: none"> ♦ Integration assessment 	<ul style="list-style-type: none"> ♦ Inbound Interface Document (IID) ♦ Draft of Batch Process Design Doc. (BPDD) 	<ul style="list-style-type: none"> ♦ Interface development - Inbound (customer) ♦ Interface development - Outbound (customer) ♦ Batch Process Design Document (BPDD) completed 	<ul style="list-style-type: none"> ♦ Integration Acceptance Test (IAT) <ul style="list-style-type: none"> ♦ Issue Resolution ♦ Define IT cutover plan ♦ Performance Tuning & Testing 	<ul style="list-style-type: none"> ♦ Custom Acceptance Test (CAT) ♦ Detailed output analysis 	<ul style="list-style-type: none"> ♦ Execute automated system and data cutover 	<ul style="list-style-type: none"> ♦ Operational Support ♦ Additional Services 	<ul style="list-style-type: none"> ♦ Custom Acceptance Test (CAT) ♦ Detailed output analysis 	<ul style="list-style-type: none"> ♦ Operational Support ♦ Additional Services
<ul style="list-style-type: none"> ♦ Current state process flows ♦ Hosting services set-up 	<ul style="list-style-type: none"> ♦ Published Report Document (PRD) ♦ Software Requirements Document (SRD) for new/custom elements <ul style="list-style-type: none"> - Pre/Post Processing - Publishing – reports - Interfaces - Infrastructure - Other new/custom req. ♦ Input data transformation/cleansing 	<ul style="list-style-type: none"> ♦ New/custom development <ul style="list-style-type: none"> - Technical design / code - QA plans and execution - Documentation ♦ Environment Certification ♦ Interface support/creation 	<ul style="list-style-type: none"> ♦ Integration Acceptance Test (IAT) <ul style="list-style-type: none"> ♦ Issue Resolution ♦ Define IT cutover plan ♦ Performance Tuning & Testing 	<ul style="list-style-type: none"> ♦ Custom Acceptance Test (CAT) ♦ Detailed output analysis 	<ul style="list-style-type: none"> ♦ Execute automated system and data cutover 	<ul style="list-style-type: none"> ♦ Operational Support ♦ Additional Services 	<ul style="list-style-type: none"> ♦ Custom Acceptance Test (CAT) ♦ Detailed output analysis 	<ul style="list-style-type: none"> ♦ Operational Support ♦ Additional Services

Common Tasks

Integration Tasks

Options

CPG Organization Supply Chain & Implementation Options

SmartOps Implementation Process

Mobilize

Design

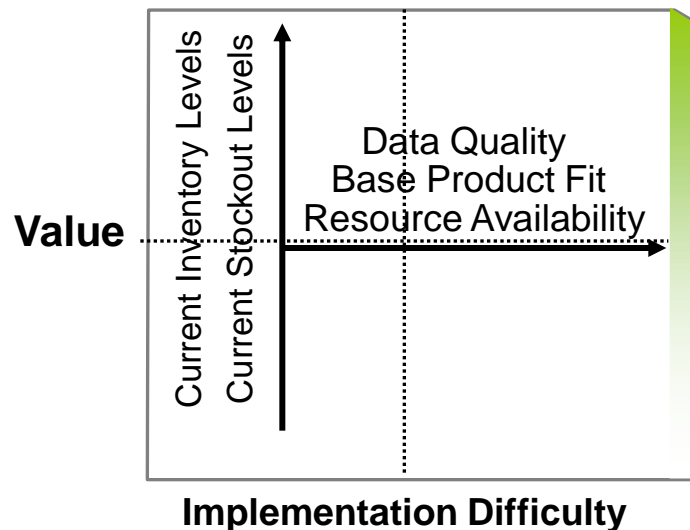
Configure

Validate

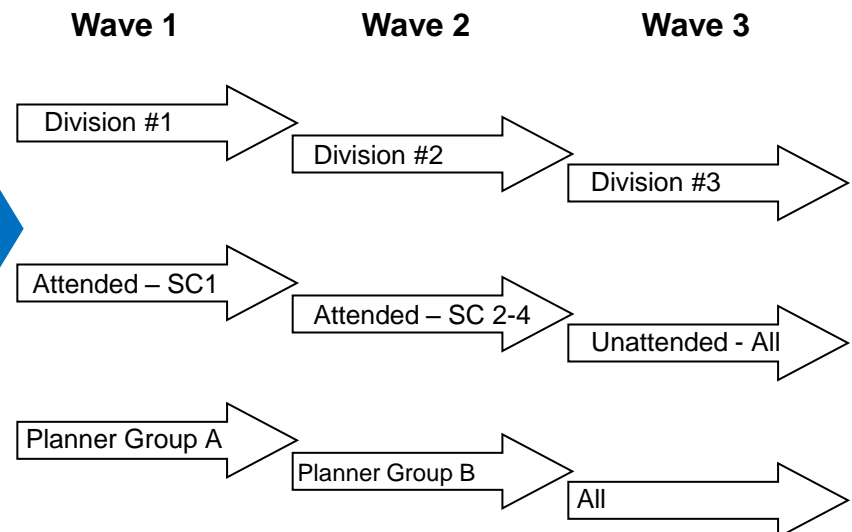
Deploy

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





“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

\$12B Consumer Packaged Goods company Business Challenges

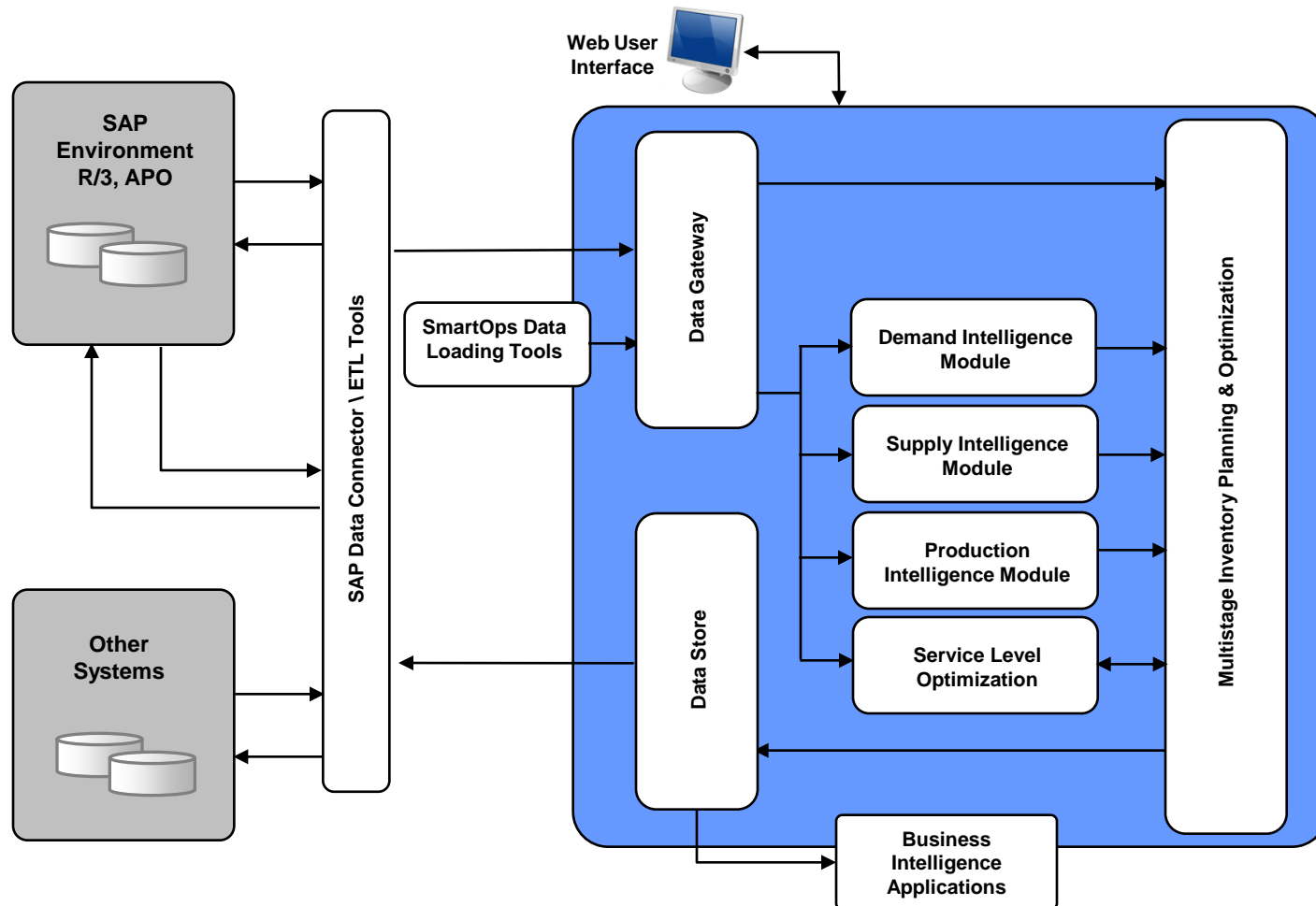
- Supply chain complexity driven by multiple inventory stocking locations
- Various production processes with unique constraints
- Considerable supply and demand uncertainty
- High, differentiated customer service requirements
- Integrated SAP SCM suite with SAP R/3, BW, APO & SmartOps MIPO

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

Integration with SAP

Possible EIO Integration Workflows



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

SmartOps Project Roles

ROLE	DUTIES	PROJECT DELIVERABLES	BACKGROUND
Project Manager – SmartOps	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Project Charter (Owner) • Solution Definition Document (Contributor) • Batch Process Design Document (Contributor) • User Acceptance Test (Owner) • Core Team Training (Owner) 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Project Charter (Contributor) • Solution Definition Document (Owner) • Batch Process Design Document (Owner) • User Acceptance Test (Contributor) • Core Team Training (Contributor) 	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.) 	<ul style="list-style-type: none"> • Application Parameters Document (Contributor) • Software Environment Sizing and Setup (Owner) 	<ul style="list-style-type: none"> • 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

ROLE	DUTIES	PROJECT DELIVERABLES	BACKGROUND
Algorithm Engineer – SmartOps	<ul style="list-style-type: none"> Modeling review and quality assurance Trains customer team on SmartOps algorithms Assists with modeling approach for any unique situations 	<ul style="list-style-type: none"> Solution Definition Document (Contributor) User Acceptance Test (Contributor) Core Team Training (Contributor) 	<ul style="list-style-type: none"> PhD in Operations Research or related field Deep knowledge of SmartOps algorithms Practical knowledge of supply chain operations and processes
Steering Team Members - SmartOps	<ul style="list-style-type: none"> Participates in SmartOps deliverable review sessions Members of SmartOps management teams Maintains relationship with customer senior leadership 		<ul style="list-style-type: none"> 10-plus years experience implementing supply chain, ERP, or related enterprise solution of software / process consulting/implementation experience Extensive knowledge of supply chain operations and processes

Role	General Responsibilities
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

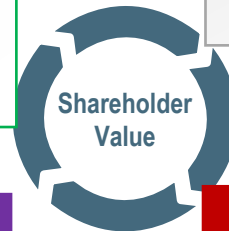
Value of Enterprise Inventory Optimization at CPG Organization

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)