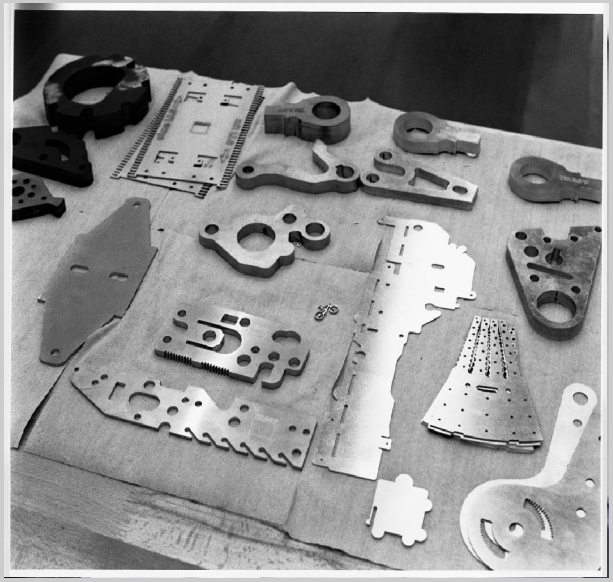
Fine-Tune Your Safety Stock Levels with SAP SCM Supply Network Planning

Advanced Safety Stock Planning



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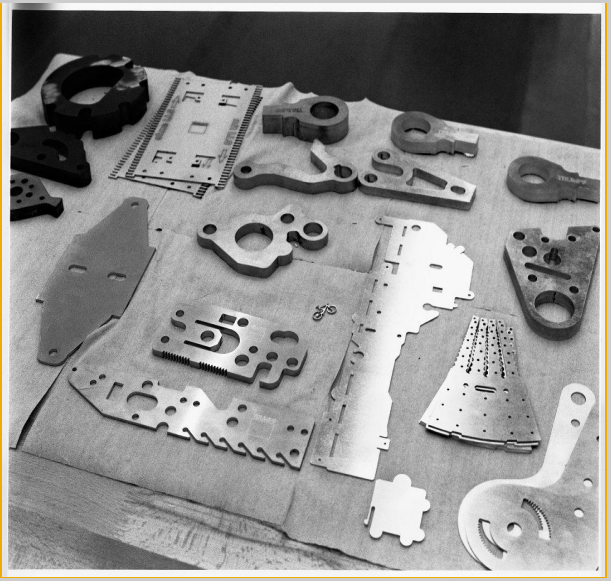
Advanced Safety Stock Planning



Inventory Management and Inventory Optimization

Safety Stock Planning in SAP SCM SNP

Inventory Optimization

What is Inventory Management?

Inventory management

- Is the process of ensuring the availability of products through inventory
- Handles all functions related to the tracking and management of material, including the monitoring of material moved into and out of stockroom locations, and the reconciling of the inventory balances
- Consists of two broad areas:
  - Inventory accounting, which is the administrative aspect
  - Inventory planning and control, which consists of planning procedures and techniques that lead to inventory order action
- Controls stock levels within the physical distribution function to balance the need for product availability against the need for minimizing stock holding and handling costs

The objective

- Is to get the right inventory, in the right place, at the right time, in the right quantity, in the right form, and at the right cost

What is Inventory Optimization?

Inventory optimization

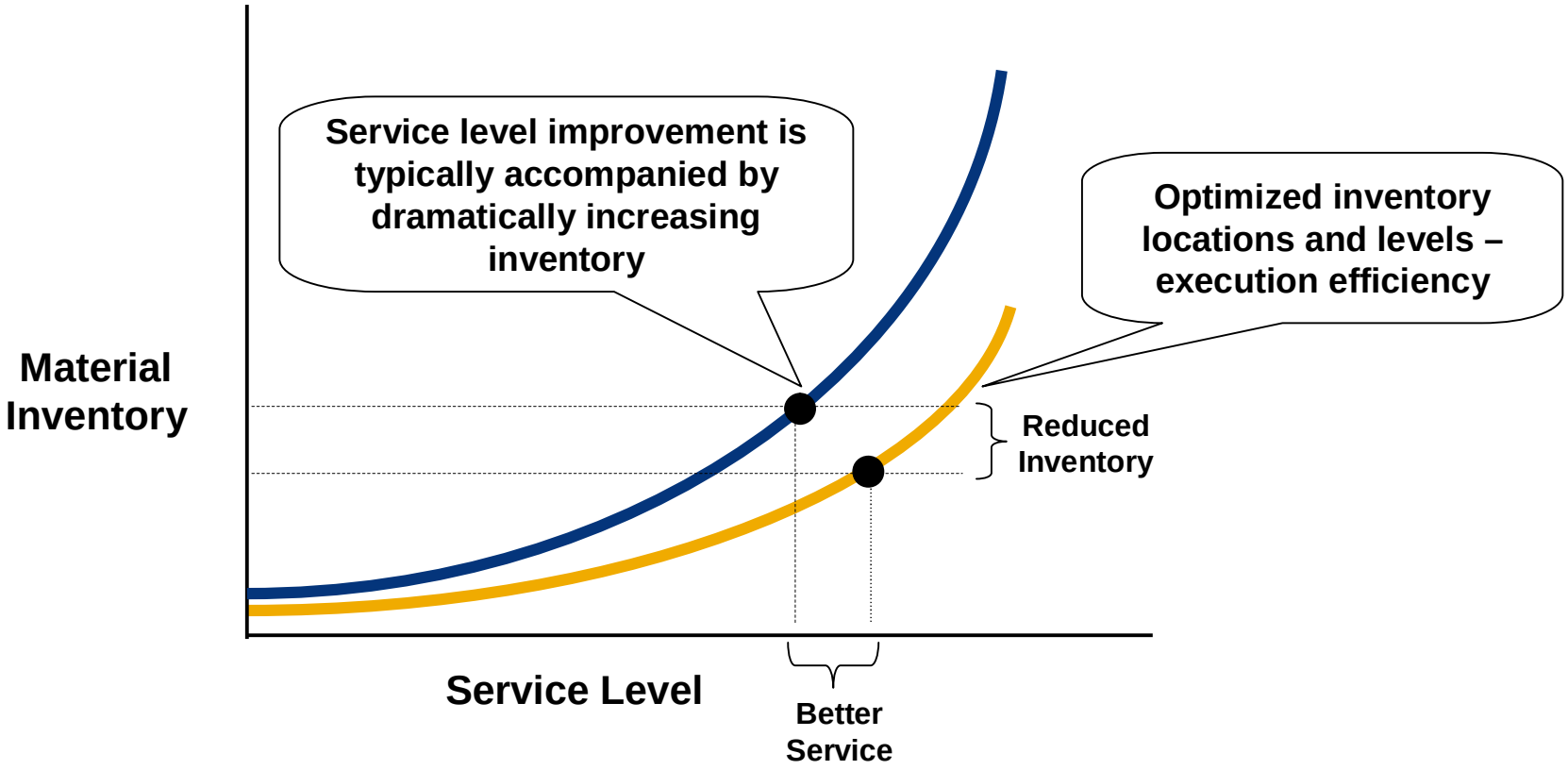
- Is a set of products and services to help customers identify and evaluate supply chain inventory strategies from either a strategic or a tactical level

The objective

- Is to determine inventory strategies and inventory influencing parameters throughout the supply chain
  - While minimizing the inventory buffer needed to achieve a predefined target service level
  - Or, maximizing the service level with a predefined inventory buffer

Inventory and Service Level Trade-Off

Inventory vs. Service Level Trade-Off



Strategies for Improving Trade-Off Balance

Reduce potential for a stock-out situation

- Reduce lead times
- Improve supply chain execution
- Improve order fill
- Reduce lot sizes

Utilize existing inventory in the best way possible

- Reduce obsolescence and obsolete inventory
- Reduce duplicate materials
- Manage interchangeabilities

Improve responsiveness

- Through better process integration
- Through better system integration (less time lost due to data integration between different systems)

Strategies for Improving Trade-Off Balance (cont.)

Understand the need for inventory buffers

- More accurate knowledge of actual lead times and variability
- Better and more accurate demand visibility
- Better inventory visibility through network driven approach

Work/act optimally within predefined inventory strategies

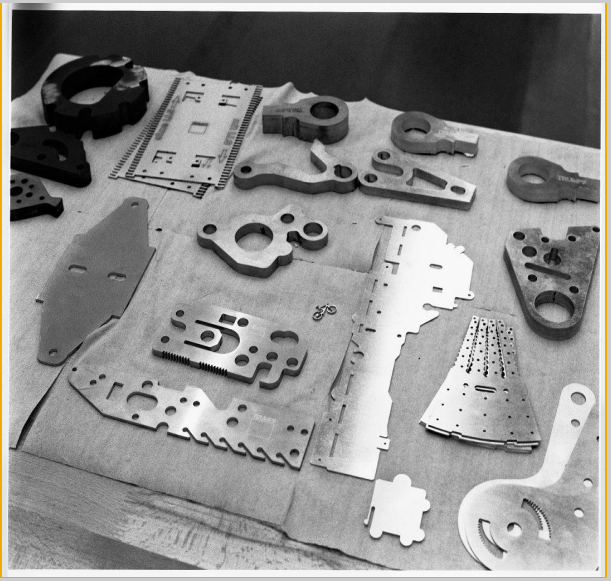
- Calculate safety stocks based on current demand information

Define inventory strategies

- Determine the optimal inventory strategies
- Determine inventory stocking locations in the network

Only the above highlighted strategies are covered in this presentation

Advanced Safety Stock Planning



Inventory Management and Inventory Optimization

Safety Stock Planning in SAP SCM SNP

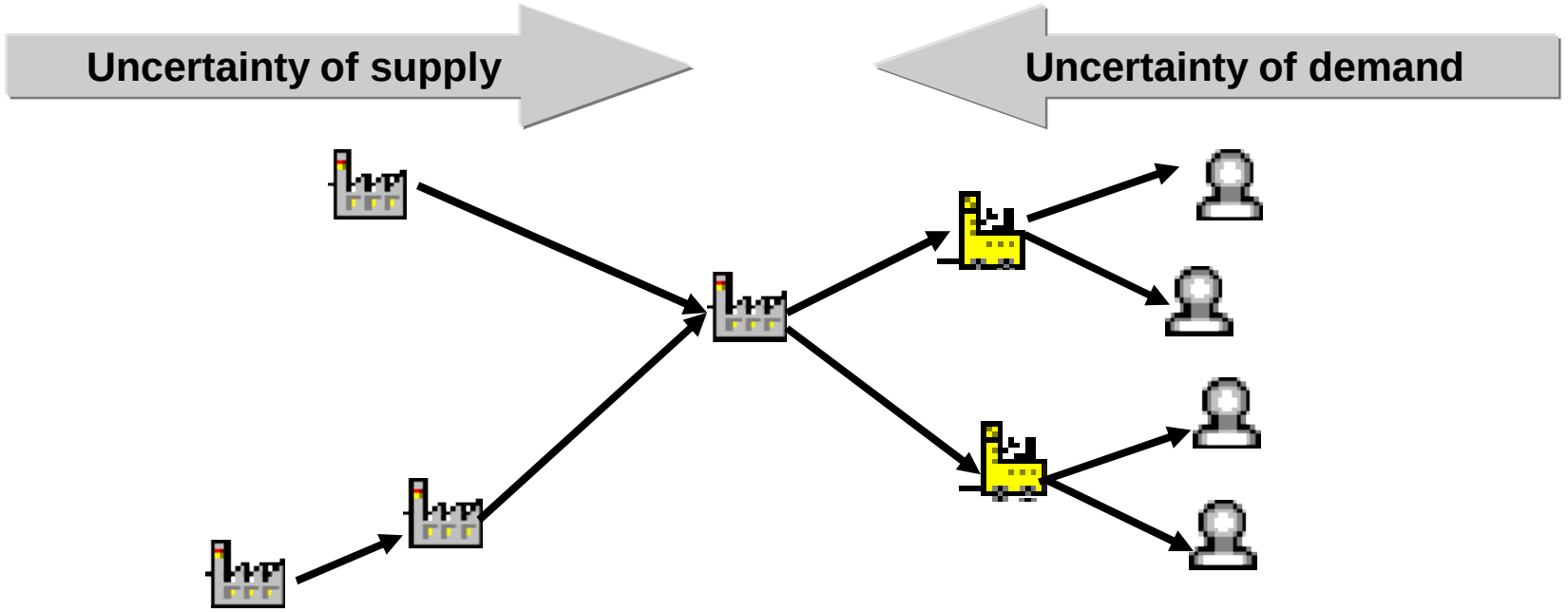
Inventory Optimization

Safety Stock Planning in SAP SCM SNP

Safety stock planning in Supply Network Planning (SNP) deals with the regular planning tasks of managing short-term and
mid-term inventory levels

- Objectives
  - Define key parameters for operative planning (safety stock)
  - Manage inventory levels on an operational basis to cope with planning uncertainties in demand and supply
- Design of the supply chain and key parameters are predefined
  - Supplier relationships
  - Lead times
  - Demand (forecast demand, customer demand, dependent demand, etc.)
  - Stocking strategies for each location

Methods to Protect Against Uncertainty



- Overestimate customer demand
- Underestimate production output quantity
- Overestimate procurement lead times
- Revised planning within rolling horizon
- Build up safety stock

What is Safety Stock Planning?

Use safety stock to safeguard the supply chain against negative effects of uncertain influencing factors like:

- Errors in predicting customer demand
- Disruptions in production
- Fluctuations in transportation times

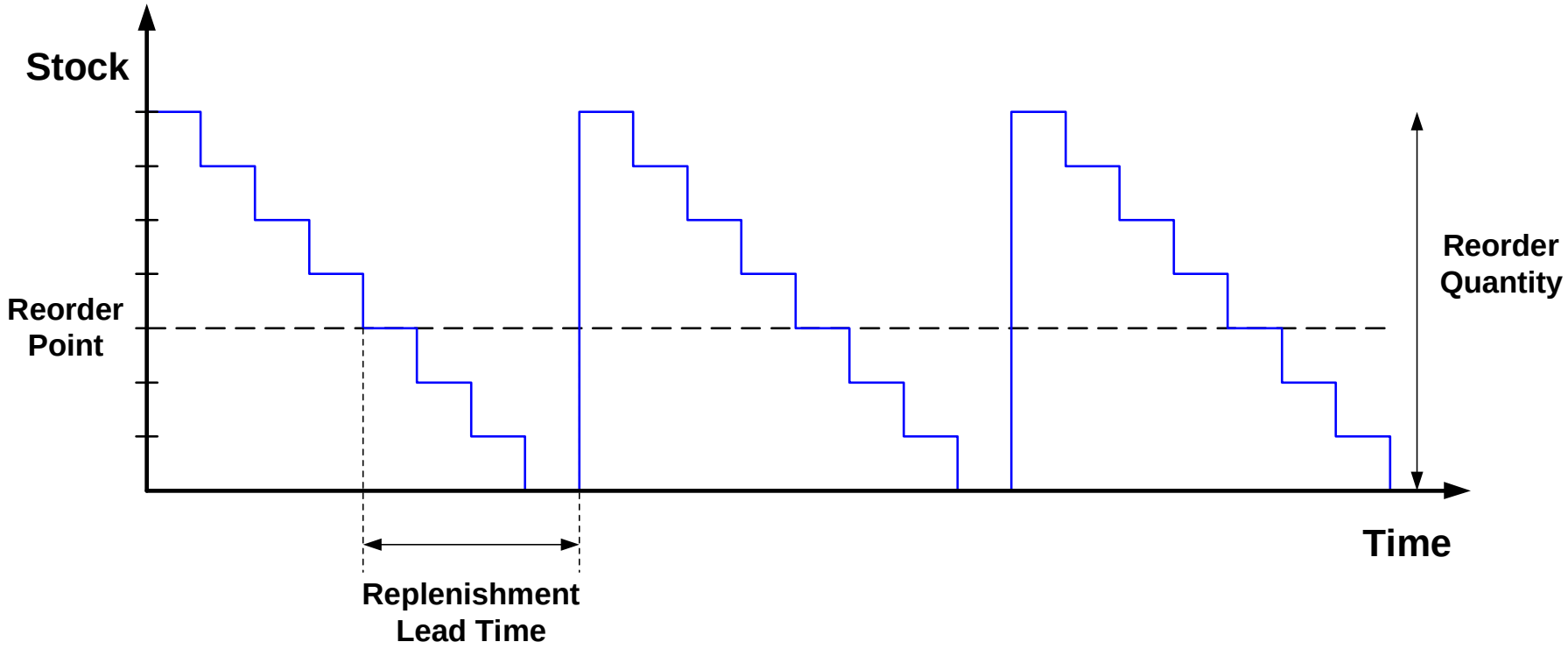
Satisfy unexpected demands caused by these factors using an extra amount of material, intermediate products, or end products

There is a trade-off between service level and storage costs

Safety Stock Planning in a Perfect World

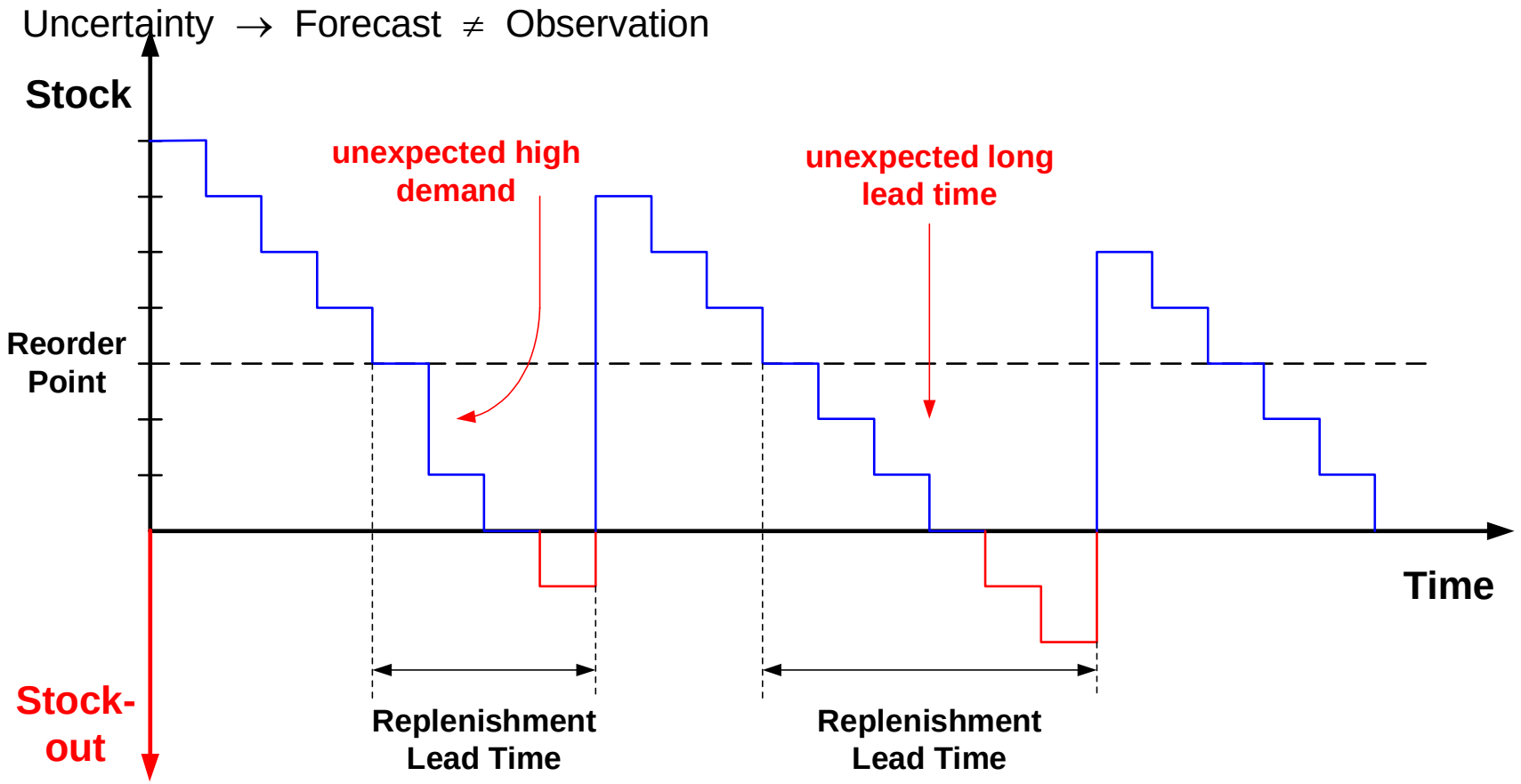
The Perfect World Scenario

No Uncertainty → Forecast = Observation



Safety Stock Planning in the Real World

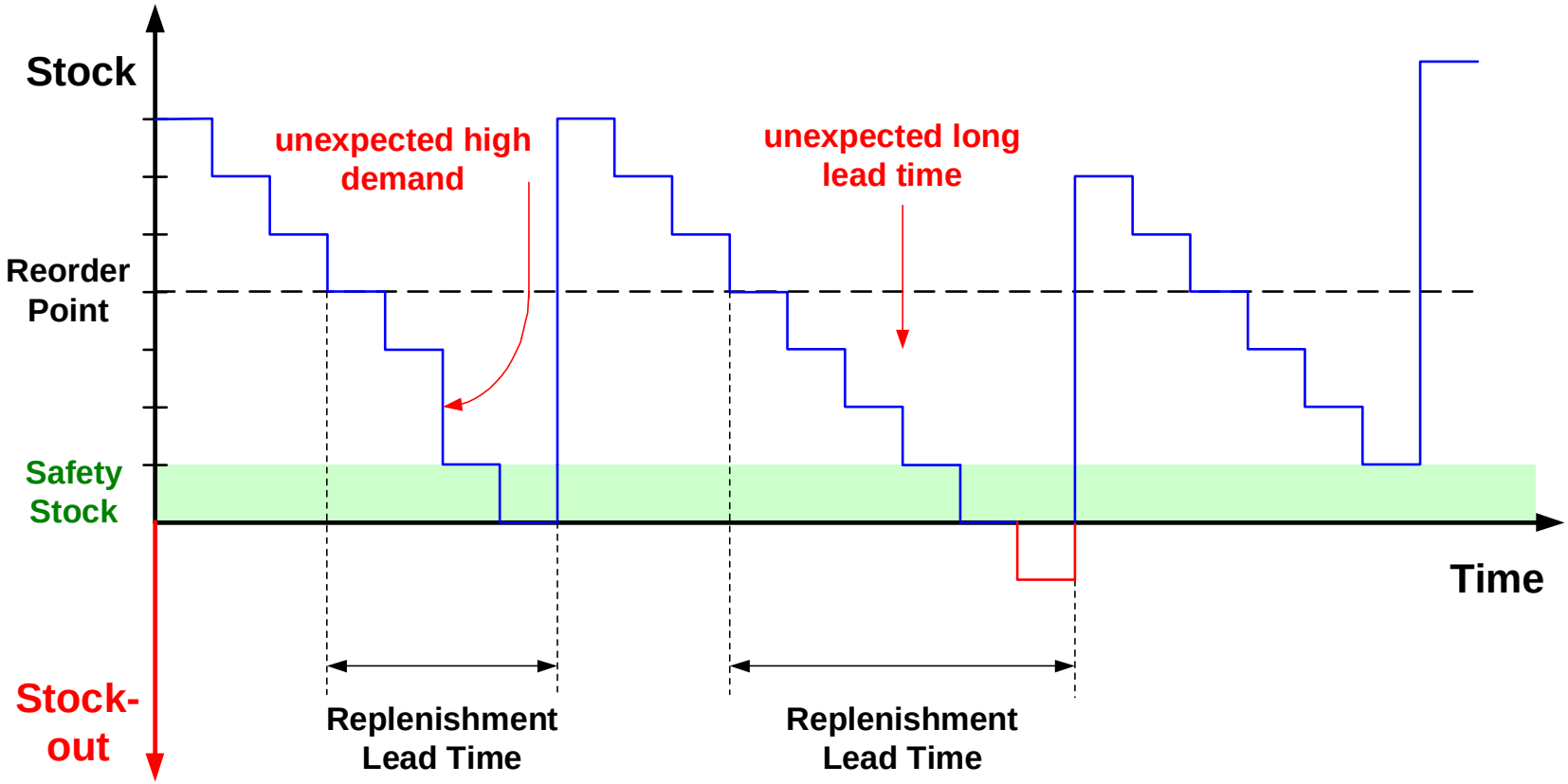
The Real World Scenario



Safety Stock Planning with a Safety Net

The Real World + Safety Net Scenario

Uncertainty → Forecast + Safety Stock ≈ Observation



Two Main Questions in Safety Stock Planning

For which products and at which locations in the supply chain should safety stock be held?

- In SAP SCM SNP, this question is completely left to the planner's experience

How much safety stock should be held?

- This question can also be left to the planner's experience (basic safety stock methods)
- However, this question can be answered by the system if the necessary input information is available (advanced safety stock methods)

Inventory Management Strategies with SAP SCM

Basic safety stock calculation methods

- Basic methods consider one location and one product at a time
- Basic safety stock calculation methods are an integral part of the SAP SCM SNP planning run

Advanced safety stock calculation methods

- Advanced safety stock calculation methods are decoupled from the SNP planning run
- Advanced methods consider the network and its structure

Lot size calculations are an integral part of the SAP SCM SNP planning run

- Lot size strategies are predefined per location product

Safety Stock Methods in SAP SCM SNP

Basic Methods

1. SB Safety stock from location product master
2. SZ Safety days' supply from location product master
3. SM Maximum from SB and SZ
4. MB Safety stock (time-based maintenance)
5. MZ Safety days' supply (time-based maintenance)
6. MM Maximum from MB and MZ (time-based maintenance)

Advanced Methods

7. AT α – service level and reorder cycle method
8. AS α – service level and reorder point method
9. BT β – service level and reorder cycle method
10. BS β – service level and reorder point method

Basic Safety Stock Methods in SAP SCM SNP

Six different basic manual methods

- Static or time-based safety stock values
- Maintained in location product master or in the interactive SNP planning table

	Static	Time-Based
Safety stock	SB	MB
Safety days' supply	SZ	MZ
Max {safety stock, safety days' supply}	SM	MM

Safety stock is built up according to these methods

Safety stock values are based on the experience of the planner

No support of the system to determine the right figures

Advanced Safety Stock Methods in SAP SCM SNP

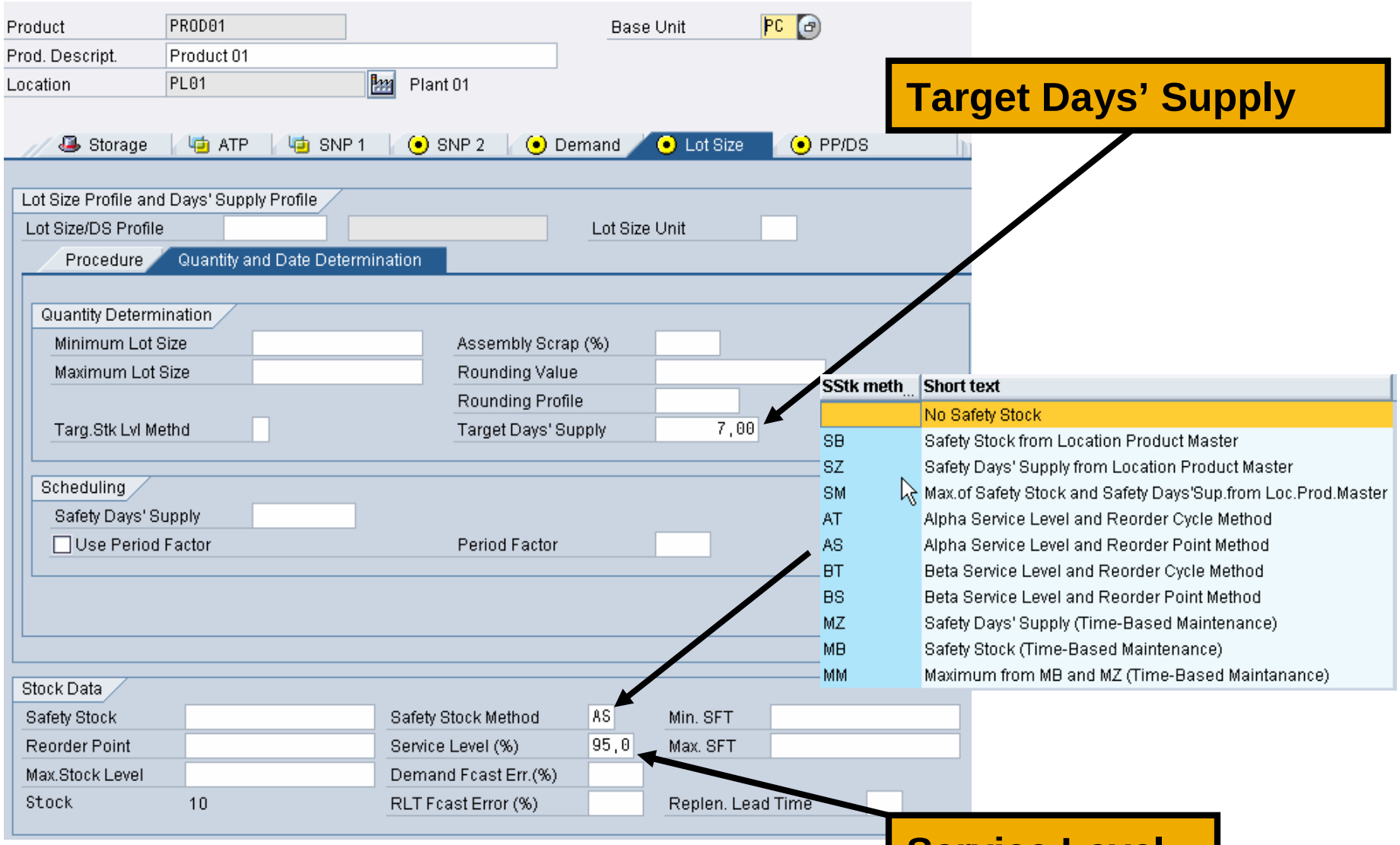
Advanced safety stock planning is model-based

- Based on uncertainty and service level
- Time-dependent
- For the entire supply chain

Model assumptions

- Regular or sporadic demand
- Backorder case
- No delay approach
- Uncertainties are independent from each other

Parameters for Advanced Safety Stock Methods



Definition of Service Levels

Alpha service level

- Service level is shortfall event-oriented
  - Number of periods with complete delivery fulfillment/total number of periods
- Useful if the customer accepts only complete deliveries (all or nothing), or if the fixed costs of subsequent deliveries are high

Beta service level

- Service level is shortfall quantity-oriented
  - Quantity delivered in time/total demand
- Useful if the customer also accepts partial deliveries or the fixed costs of subsequent deliveries are low

Inventory Strategies According to the Reorder Time

Reorder point strategies

- Purchase order decision is stock-dependent
- Procurement is triggered when stock falls to or is below a predefined stock level (reorder point)

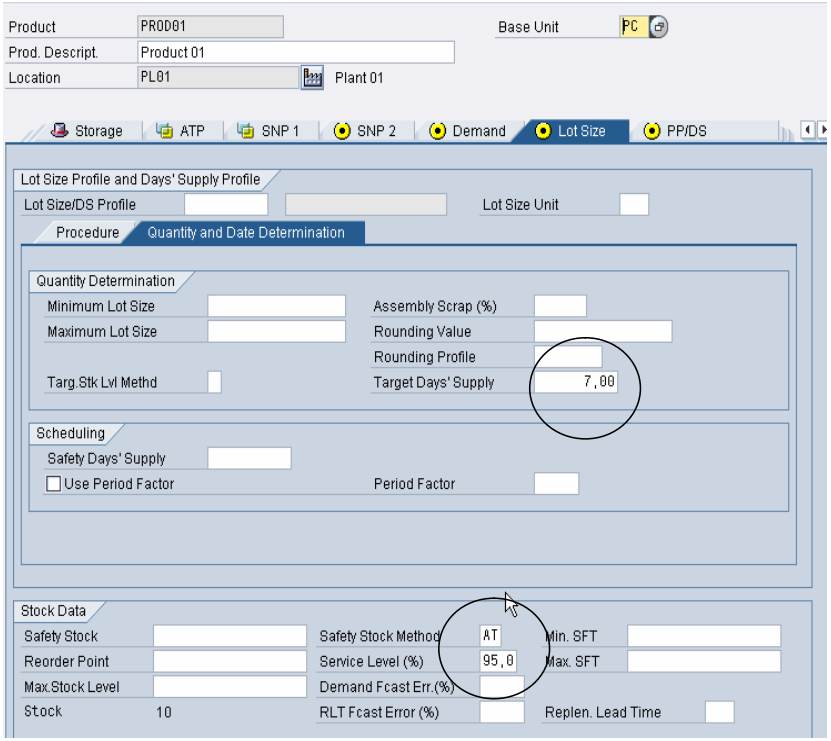
Reorder cycle strategies

- Purchase order decision is time-dependent
- Procurement is triggered regularly at certain points in time (reorder cycles)

Advanced Safety Stock Planning Methods

Method AT

- Alpha service level, reorder cycle strategy
- Target Days' Supply is used as reorder cycle length



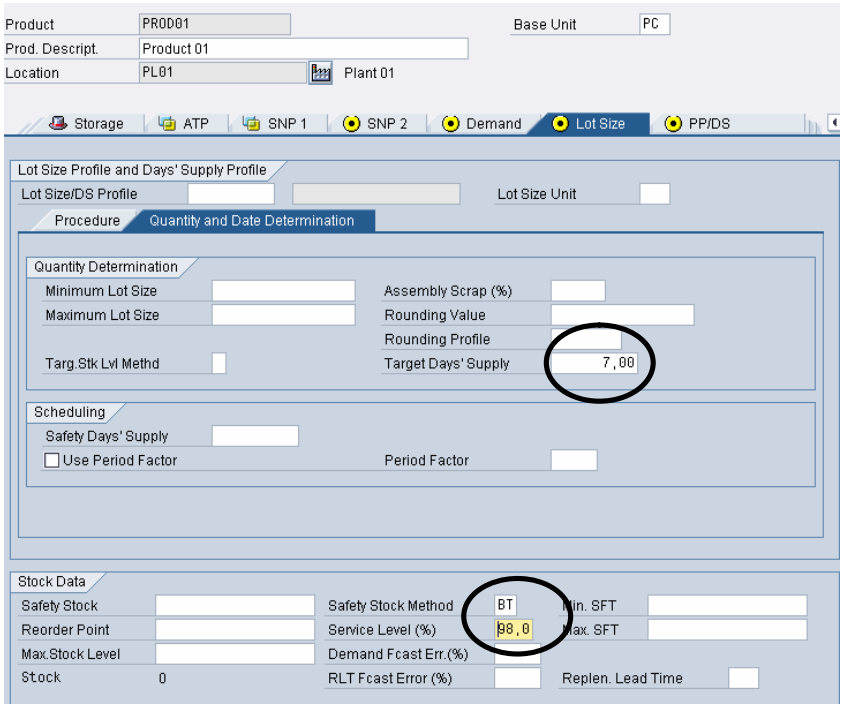
Method AS

- Alpha service level, reorder point strategy

Advanced Safety Stock Planning Methods (cont.)

Method BT

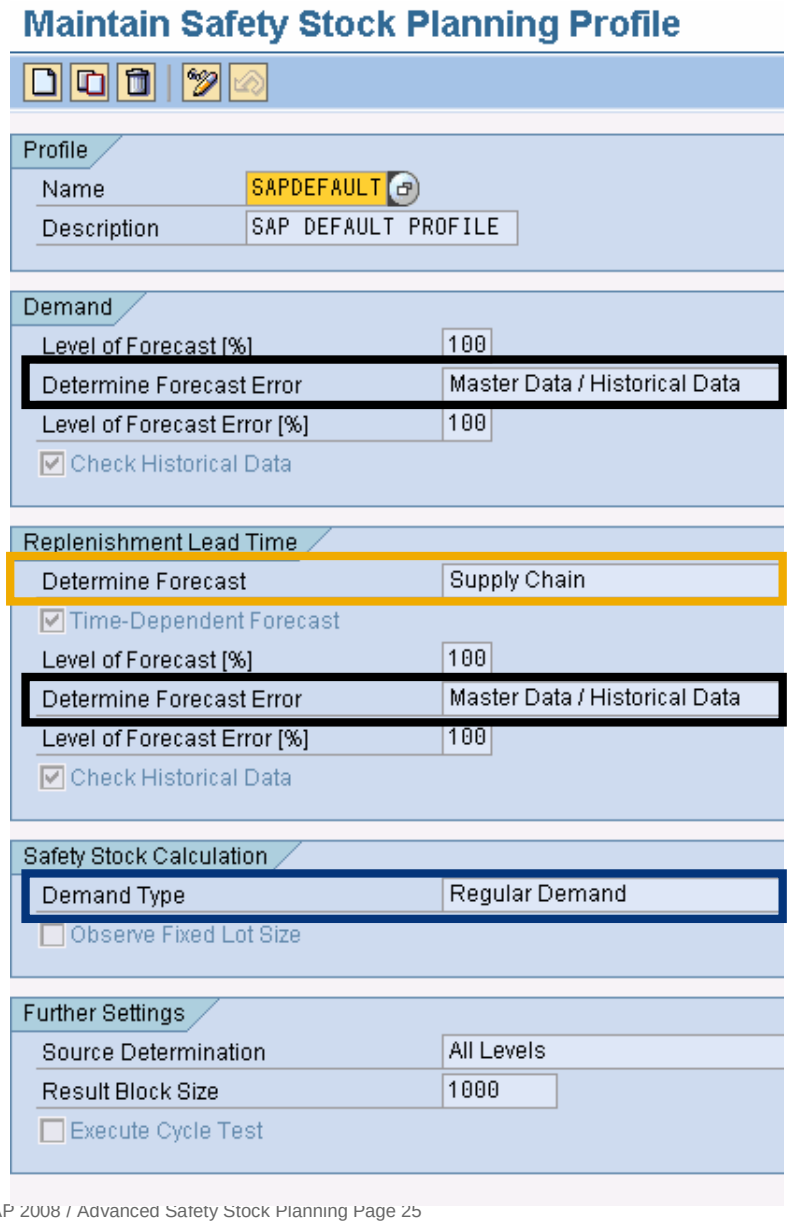
- Beta service level, reorder cycle strategy
- Target Days' Supply is used as reorder cycle length



Method BS

- Beta service level, reorder point strategy
- Lot size is either equal to Target Days' Supply x Forecasted Demand or it is taken from the fixed lot size in the location product master

Safety Stock Planning Profile



Determination of Forecast Error (Demand/Replenishment Lead Time)

- **Historical data**
- **Master data**
- **Master data/historical data**

Determination of Replenishment Lead Time

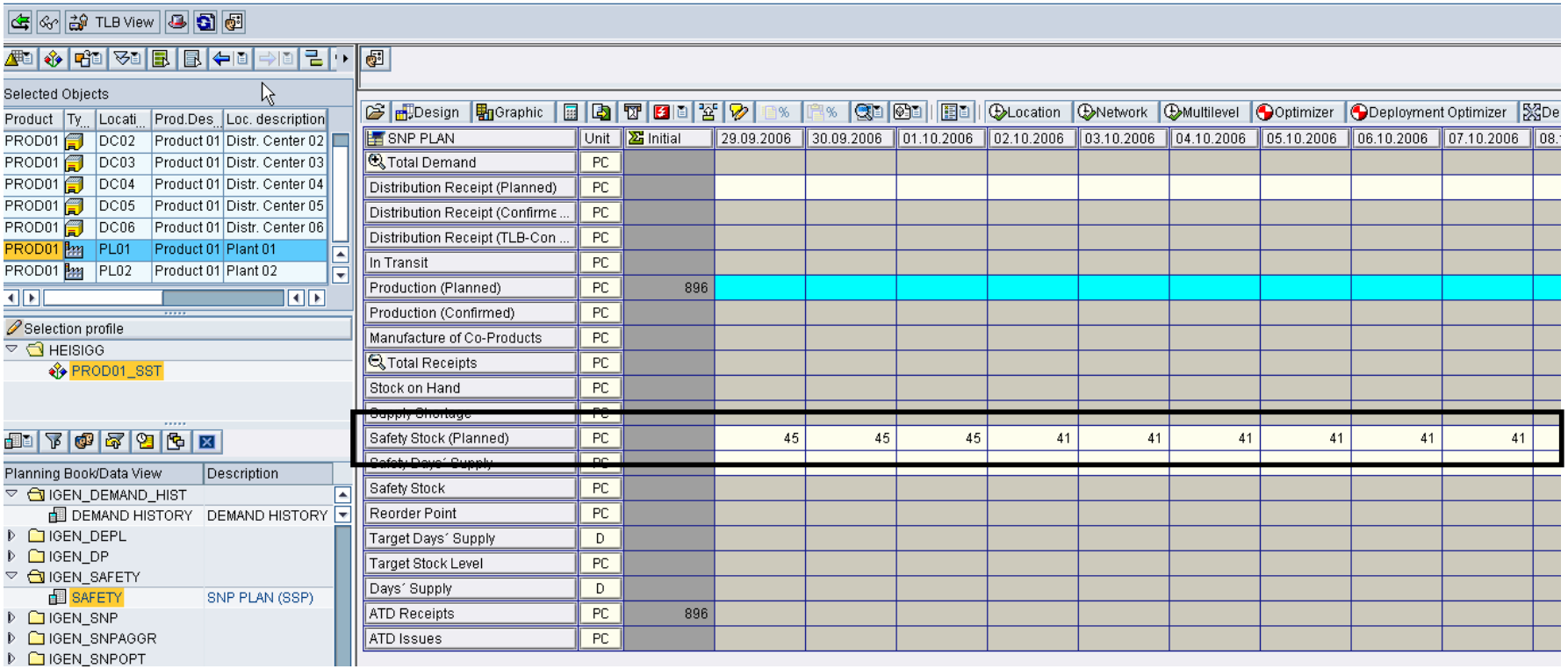
- **Supply chain**
- **Master data**
- **Master data/supply chain**

Demand Type

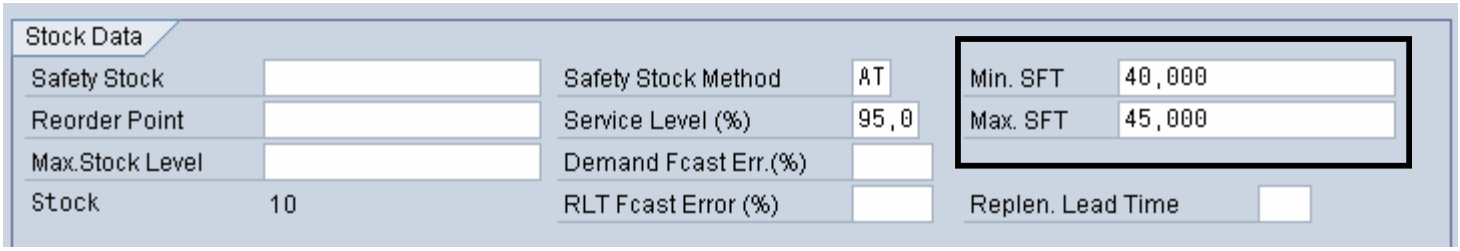
- **Regular demand**
- **Sporadic demand**
- **Determine automatically**

Safety Stock Planning

Planning Book: [Live] SNP SAFETY STOCK PLANNING / SNP PLAN (SSP)



Minimum and maximum value for safety stock



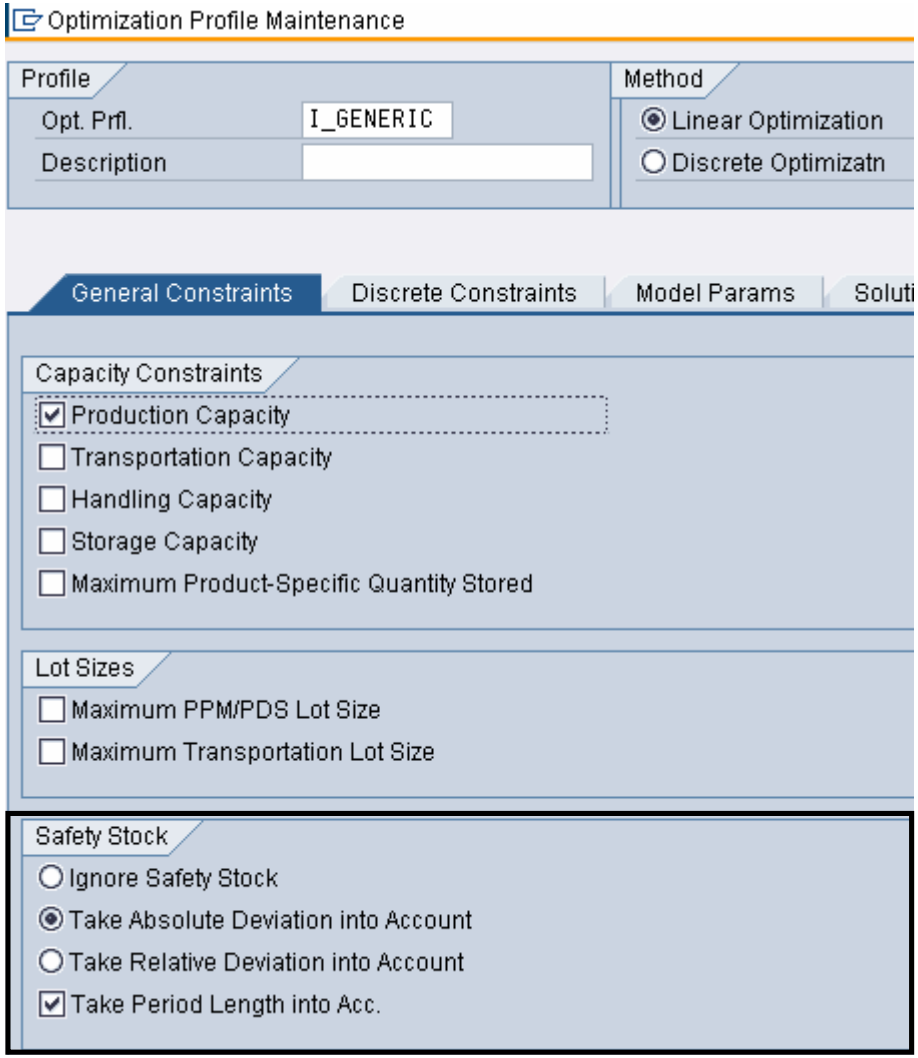
Safety Stock Planning and SNP Optimization

SNP optimization supports the following methods:

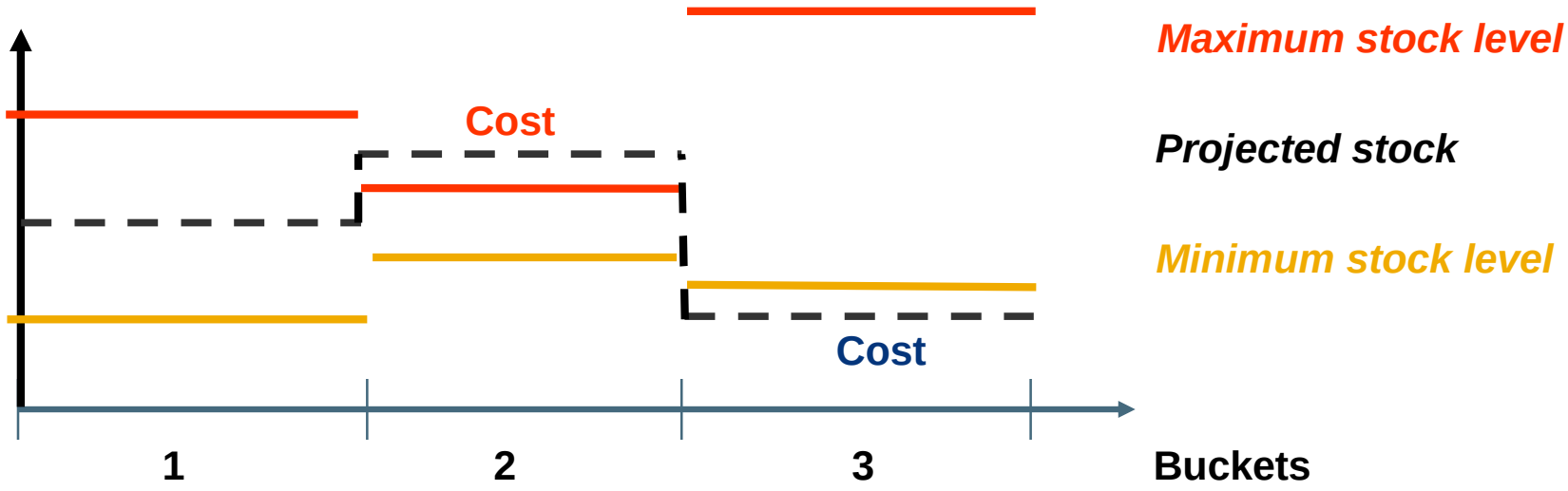
- SB Safety stock from location product master
- SZ Safety days' supply from location product master
- MB Safety stock (time-dependent maintenance)
- MZ Safety days' supply (time-dependent maintenance)
- AT a – service level and reorder cycle method
- AS a – service level and reorder point method
- BT b – service level and reorder cycle method
- BS b – service level and reorder point method

Consideration of Safety Stock in SNP Optimization

Safety stock is considered as input for the SNP optimization run

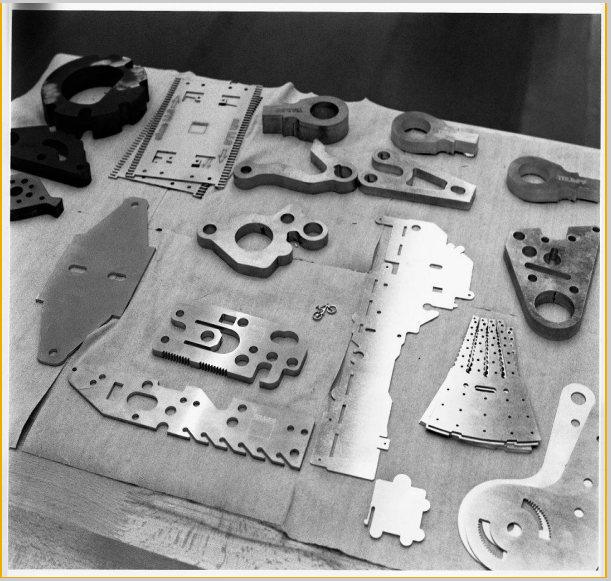


Optimizing Stock Levels with SNP Optimization



- Optimization monitors that actual stock lies between maximum stock level and minimum stock level (= safety stock)
- Both stock levels can be time-dependent
- If planned stock is above maximum stock or below safety stock, then penalty cost occurs

Advanced Safety Stock Planning

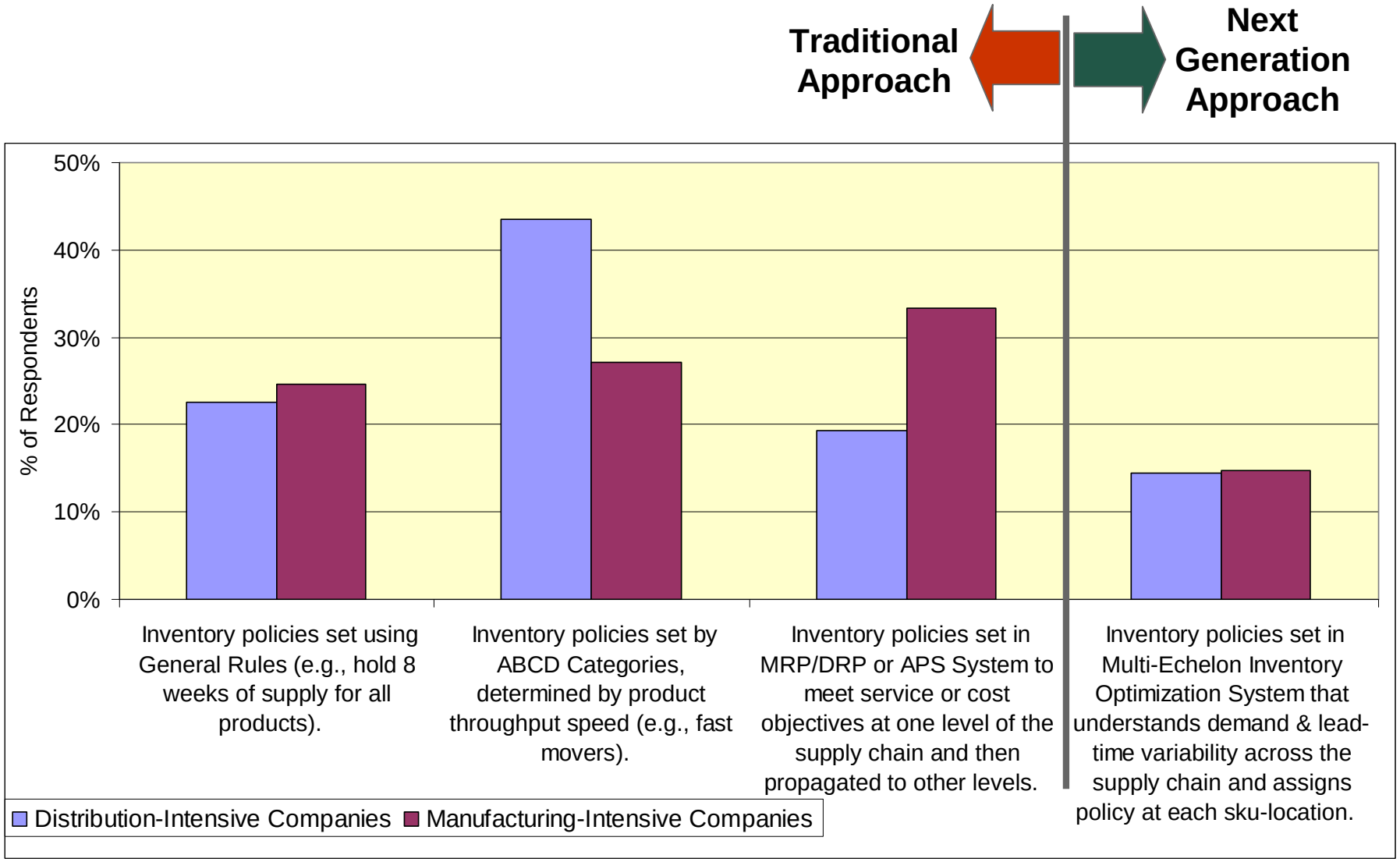


Inventory Management and Inventory Optimization

Safety Stock Planning in SAP SCM SNP

Inventory Optimization

Inventory Policy Practices

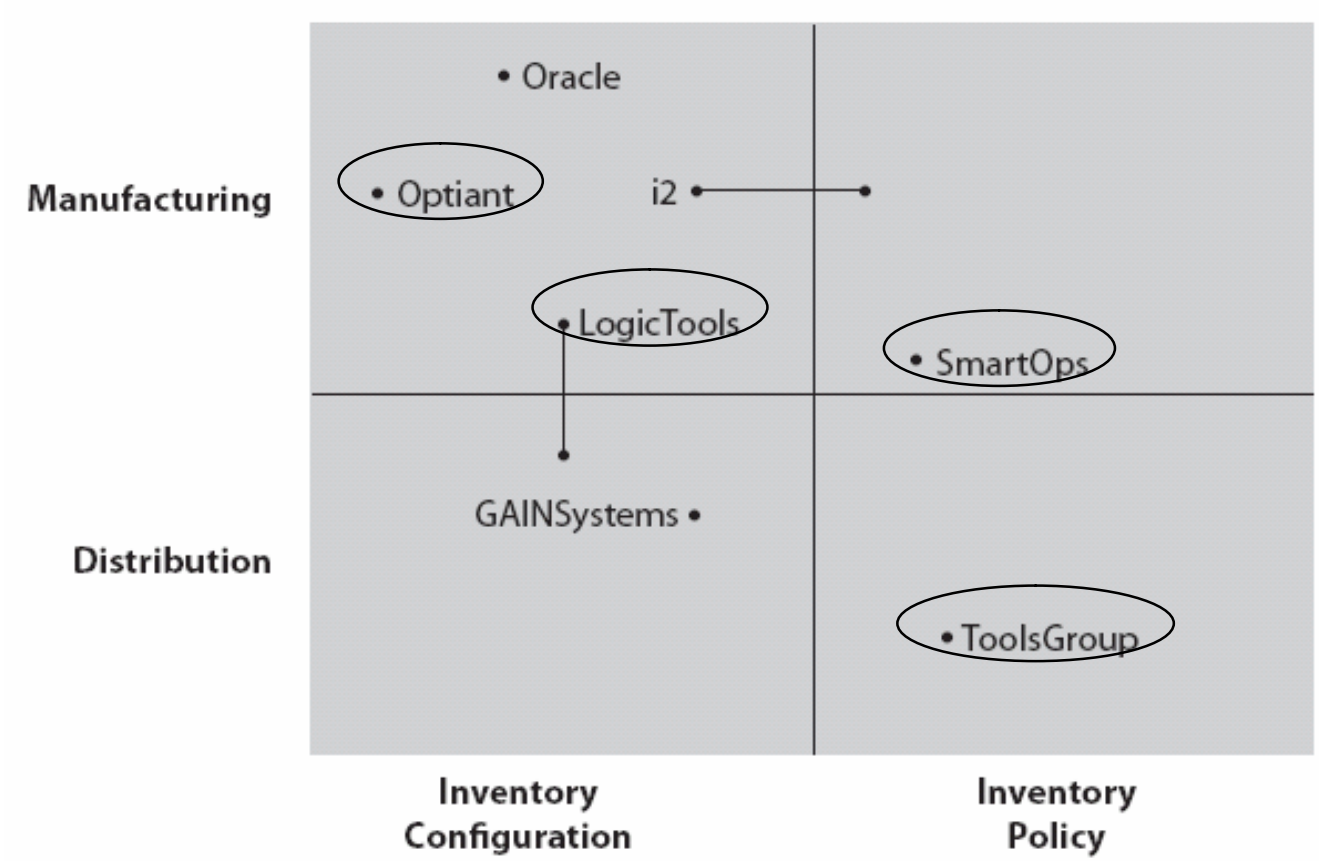


Source: Aberdeen Group, 2004; Survey Results of 178 companies

Inventory Configuration and Policy Vendors

Manufacturing technologies: **Capabilities to model deep bills of materials and optimize complex postponement strategies across a multi-tiered network, accounting for supply variances within the network**

Distribution technologies: **Technologies that focus on service levels by both the type of customer and inventory classification by analyzing the right inventory levels based on demand and supply variability within a multi-tiered network**

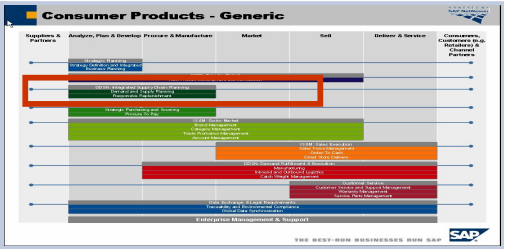


Source: AMR, Redefining the Role of Inventory for Demand-Driven Supply Networks, 2005

SAP Enterprise Inventory Optimization with SmartOps

The SAP-SmartOps Enterprise Inventory Optimization solution is used to determine optimal and visible supply chain inventory policies

Enterprise Inventory Optimization is a key component of succesful DDSN Integrated Planning and Optimization and Dynamic S&OP processes



Industry Pain Points

- High carrying cost of inventory ties up working capital and reduces cash flow
- Order fill rates and inventory turns are below best-in-class due to uncertain demand and supply events
- Missing on-time delivery targets is a key factor for customer satisfaction
- Product proliferation and globalization causes planners and analysts to have less time to manage more supply chains

Business Benefits

- Reduced working capital and improved cash flow
- 20-40% reduction in Inventory costs
- 5-10% Improvement in Order Fill Rates
- 20-30% improvements in Order Lead Times
- Improved planner and analyst productivity – automated, reliable process allows planners to focus on highest value products and customers

Solution

xAPP MIPO

POWERED BY SAP NetWeaver

- Multi-echelon inventory optimization
- Advanced Demand and Supply Profiling leverages SAP BW/BI
- Total supply chain view and operational synchronization
- Implemented in very large scale production environments
- xApp certification and dynamic SAP integration

SmartOps®

Thank you!

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