



Center for Business Optimization
Turning Analytics into Action

**Dynamic Inventory Optimization
Solution Fact Sheet**

INDUSTRY
SECTOR

Cross
Cross



Minimize inventory and related costs while improving availability and service levels

Demand uncertainty has compelled many companies to overstock their inventories—a costly problem in itself—yet most continue to achieve lower service levels and fill rates than desired. The widespread advent of contract manufacturing and complex supply chain networks has further complicated the issue, thrusting inventory planning and management to top-of-mind for manufacturing and financial executives. The IBM Dynamic Inventory Optimization Solution addresses inventory inefficiencies by determining the optimal levels of inventory and safety stock to have on-hand to meet service levels, supplier lead times, budgeting, and batch size constraints. Furthermore, the solution helps companies forecast inventory demands with a greater degree of accuracy.

Value Proposition

Every day companies hold excess inventory, they lose money. Yet holding inventory is beneficial for the right reasons. The Dynamic Inventory Optimization Solution assists companies in optimizing and managing their inventory levels while helping them achieve better bottom-line results. The solution assesses inventory reduction opportunities by determining optimal inventory levels and calculating optimal order quantities, safety stocks and availability.

Benefits of inventory optimization include:

- Reduced inventory levels, expedites, and overall logistical costs
- Service level attainment, leading to higher levels of customer satisfaction
- Improved asset utilization and inventory turns
- Improved inventory performance
- Improved product availability and reduced carrying costs, risk, and cash-to-cash cycles

The Dynamic Inventory Optimization Solution tracks and analyzes transactions and customer usage patterns, combined with service level and inventory performance. It performs multi-dimensional material segmentation using several standard attributes, as well as custom attributes. The solution provides easy composition, simulation and analysis of “what if” scenarios; multistage inventory and postponement optimization, rapid integration leading to ROI, and a rich library of packaged metrics, Key Performance Indicators (KPI) and reports.

Business Drivers

The Dynamic Inventory Optimization Solution addresses a number of strategic, tactical and operational challenges faced by our clients. Among them are:

Strategic

- Establishing inventory policies and levels
- Evaluation of service levels
- Long-term forecasts of warehouse capacities

Tactical

- Identification of stock overages and shortages
- Evaluation of inventory policies and operations
- Near-term forecasts of stock consumption
- Evaluation of stock/service level trade-offs
- Ability to operate within budget constraints

Operational

- Optimizing replenishment parameters at the SKU level
- Creating replenishment orders based on client-specific replenishment logic
- Combining demand forecasting and inventory policies

Our Point of View

Many warehouse inventory optimization models assume a normal distribution of demand to calculate the best warehouse safety stock (covering demand uncertainty during inbound lead times). IBM's experience suggests this assumption fails for a significant portion of stock in a typical warehouse. The Dynamic Inventory Optimization Solution is unique in the industry and utilizes patented safety stock methods that handle a wide

range of demand patterns. The underlying principle applies advanced clustering methods, providing parameters that have a much better correspondence between actual and planned service levels, as well as greatly reduced stock requirements (15-40%). These findings have been demonstrated at numerous IBM clients.

The solution uses best-of-breed classifications (e.g., K curve), adaptive and numerical safety stocks, and a forecast engine with variable rolling time buckets.

Solution Features

Based on the Advanced Inventory Manager, developed by IBM Research in Zurich, the Dynamic Inventory Optimization Solution is a comprehensive, integrated offering that includes:

- A fully featured user interface
- Integration with SAP, Baan, and legacy systems
- DB2
- Extensive online documentation integrated into the application
- A comprehensive user training curriculum
- Multiple solution plug-ins (e.g., replenishment order generation, budget optimization, optimization of stock/no stock decisions)

Solution Accelerators/Assets

The Dynamic Inventory Optimization Solution is supported by a number of accelerators and assets, including:

- Marketing collateral
- White paper
- Proposal template

Architecture

The optimization engine runs in a Microsoft Windows environment.

Credentials and Success Stories

A European “do-it-yourself” retailer wanted to centralize and automatically generate order proposals to replenish inventory for both its central distribution centers (CDCs) and 80 store locations. Accurate forecasts were also needed since demand for many items tended to be sporadic.

IBM consultants set up the Dynamic Inventory Optimization Solution to gather and analyze data on 70,000 items from the retailer’s CDCs and stores—over 5.6 million datasets gathered daily

from point-of-sale (POS) information. The solution creates replenishment purchase orders for each supplier to each location and generates reports for analytic use. The solution can also consider the effect a previous promotion has had on a particular item and aid in forecasting the inventory needed when a similar promotion is run again.

The client has achieved service levels in excess of 99 percent on selected items in its 80 stores with extremely low stock-out probability. In addition, 90 percent of the articles can be replenished automatically, allowing planners to focus on exceptions.

Resources

The IBM Center for Business Optimization (CBO) deploys a team of consultants who combine their industry and process expertise with IBM’s capabilities and resources in advanced mathematical research, business performance management, business intelligence systems, software and deep computing to provide a significantly differentiated service to clients.

More information about the center can be found at: w3.ibm.com/services/bcs/cbo

Materials are available in IBM KnowledgeView at: w3.ibm.com/services/bcs/km/knowledgeviewportal/kvfeServlets/jsp/login_custom.jsp

Contact the CBO

If you would like more information or have a business opportunity for the CBO, please contact:

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