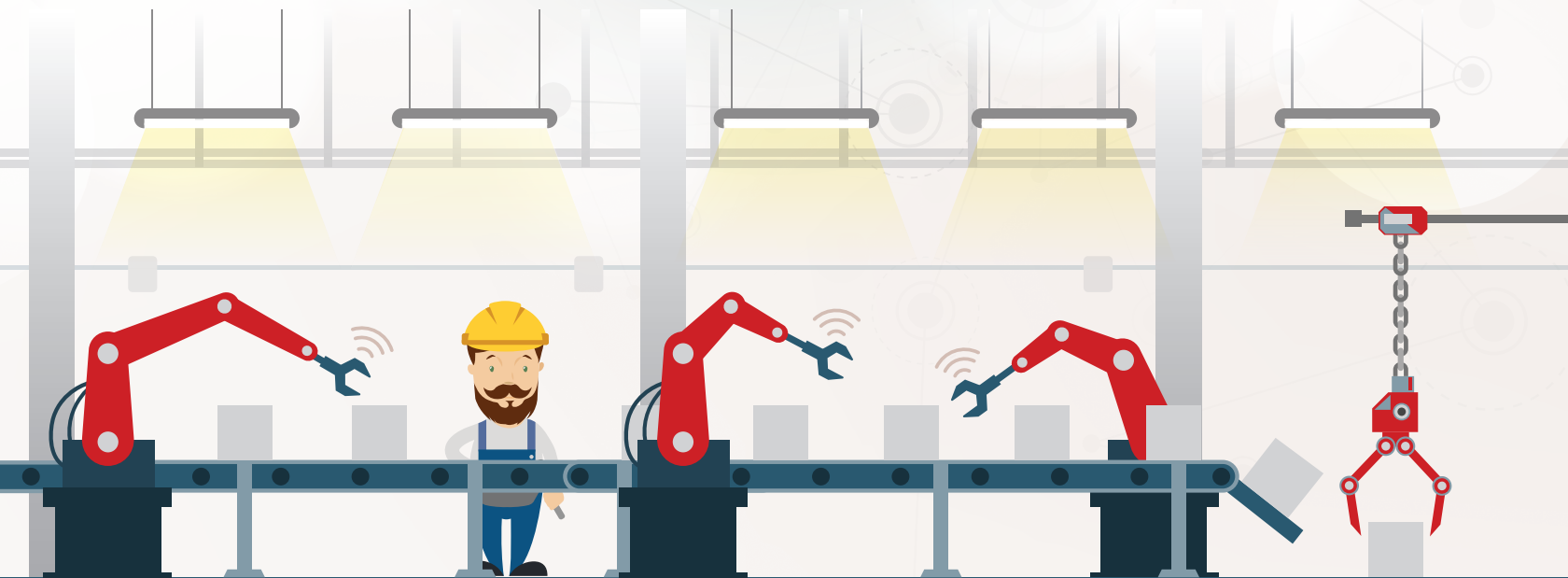


One-Plan Supply and Production Management Solutions

Optimize Capacity Utilization. Intelligently Meet Demand.

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Synchronize Demand and Supply

Ensuring customer satisfaction is heavily reliant on your ability to accurately match supply with demand. An imbalance between demand and supply could lead to reduced customer satisfaction or increased costs.

At Arkieva, we understand that balancing supply and demand is a critical task for your organization. Arkieva provides a wide range of supply and production planning solutions to ensure that your supply meets demand while aligning:

- ✓ Available assets such as capacity, materials and labor
- ✓ Production and distribution network
- ✓ Business policies and goals

Arkieva supply planning solutions automate manual supply planning tasks while integrating demand and scheduling plans for optimal performance.

Optimize Supply. Intelligently Meet Demand.

- Optimize profits and margins while meeting demand
- Reduce production costs
- Improve supply and demand balancing
- Optimize Production, Shipment, and Purchase plans
- Improve Materials Requirement Planning (MRP)
- Maximize capacity utilization with better Capacity Requirements Planning (CRP)
- Create an efficient Distribution Requirements Plan (DRP)
- Effectively utilize your resources including assets and key raw materials
- Robust scenario analysis for creating contingency plans by considering multiple what-if scenarios

Arkieva Supply and Production Scheduling Solutions





Arkieva Replenishment Planner

Deliver the Right Product – To the Right Location – At the Right Time.

Respond quickly and efficiently to a rapidly changing environment with the Arkieva Replenishment Planner. The Replenishment Planner is a multi-echelon planning solution that ensures that the right quantity and mix of products are shipped to the right location, at the right time. The Replenishment Planner uses a proprietary, sequential, rule-based algorithm to plan supply across a multi-echelon supply chain network.

React Quickly and Effectively to Supply Chain Issues

- **Identify near term supply** for products that should be processed sequentially within a 4-13-week time frame.
- **Integrate exception planning** for automatic alerts on potential issues with solution options for quick reactions to problems.
- **Rapidly plan downstream supply** across the network for a fair distribution of inventory across the network if supply is constrained.
- **Automate order consideration** for open sales orders, fixed production, transfer, and purchase orders.
- **Compare scenario trade-offs** with what-if scenario reporting to determine the best-fit plan.
- **Gain network visibility** of projected inventory for each SKU for each time, through easy drill-down reports.



Built-in Proprietary Algorithm Designed to Fit Your Operations Process.

- **Automatically Fill Orders Before Rebuilding Safety Stock with Built-in Heuristics**
The Arkieva Replenishment Planner evaluates alternative ways of fulfilling demand and selecting the most cost-effective option.
- **Prioritize Based on Customer or Product Classifications**
Use business plan prioritization to fulfill demand for high priority customer/products over low priority ones and minimize late orders.
- **Integrated MRP and DRP**
Determine raw material procurement and sourcing requirements in conjunction with product distribution. Integrate your replenishment plans with your materials and distribution resource planning.
- **Embedded Scenario Planning**
Perform what-if analyses based on different demand supply planning assumptions using the embedded, robust scenario planning features.
- **Easy Telescoping of Planning Horizons**
Quickly extend planning horizon within the same model using daily buckets in the near-term, and weekly or monthly buckets further out.
- **Detailed Trace Reporting**
Easily determine how every decision is made by the Replenishment Planner's algorithmic model.
- **Intuitive Shortage Analysis**
Discover reasons for missed orders using drill-down reports that outline the reasons including, lead time constraint, capacity constraint, or component shortages.
- **Automatic Inventory Balancing**
Balance inventory across a multi-echelon network of locations through various replenishment policies instantaneously.
- **Identify Unfilled Demand**
Detect the cause for late orders for each instance to improve customer satisfaction.

Arkieva Inventory Planner and Analyzer

You probably have a love-hate relationship with your inventory.

When you don't have a lot of excess inventory, you have an increase in cash flow. On the other hand, if you stock out due to too little inventory, you run the risk of losing customers to your competitors. This inventory balancing act makes it essential for you to get your inventory estimates right, helping you achieve optimal inventory levels which reducing costs while maintaining customer satisfaction.

Reduce Excess Inventory with the Arkieva Inventory Planner and Analyzer

- Gain easy, single-screen inventory visibility of any SKU (or any grouping) by location
- Create multiple scenarios to determine the desired service level and inventory impacts
- Select the best-fit inventory method by comparing results from different Safety Stock methods
- Easily determine re-order points and cycle stocks to avoid stockouts
- Get automatic alerts when conditions cross user-defined thresholds
- Identify stocking points with inventory balances not justified by demand variability or historical supply needs
- Calculate optimal safety stock balances at SKU and location level
- Identify accumulations of obsolete or off-spec inventories that should be aggressively reduced
- Quickly analyze inventory over time by aggregation over any product attribute including, product family, warehouse, and inventory type (raw, semi-finished, finished product)
- Perform batch- or lot-level reporting for aging analysis, remaining shelf-life; among others



Discover key areas causing disruptions or improvement areas

Increase Customer Delight. Have the Right Product, at the Right Place, at the Right Time.

Create sustained inventory reductions with access to a comprehensive view and analysis of how stocks are serving customer demand using the Arkieva Inventory Management Solutions.

Monitor Inventory Health



Track relevant inventory metrics: Metrics include days' supply, inventory velocity, effective service levels, and inventory turns



Identify money saving opportunities using the Arkieva continuous monitoring system



Get policy recommendations for dead, sparse, new, active, make-to-order, make-to-stock, and make-to-negotiate inventory

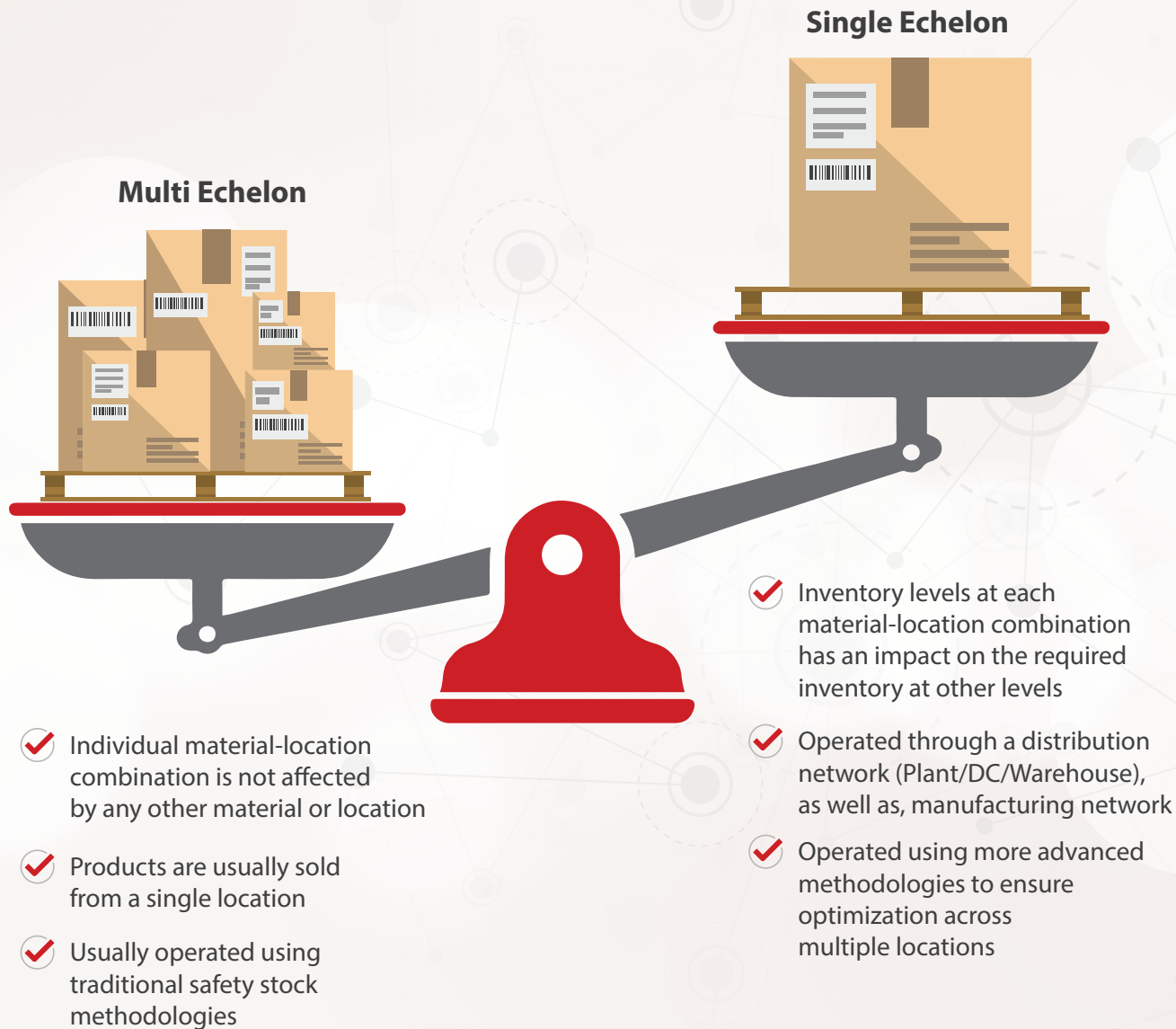
Optimize Inventory Targets Across Multiple Locations

Inevitably, operating a global or national business requires holding inventory at different locations to optimize delivery. Managing inventory at different locations becomes increasingly complex to ensure that the optimal inventory is kept at the right location and at the right time.

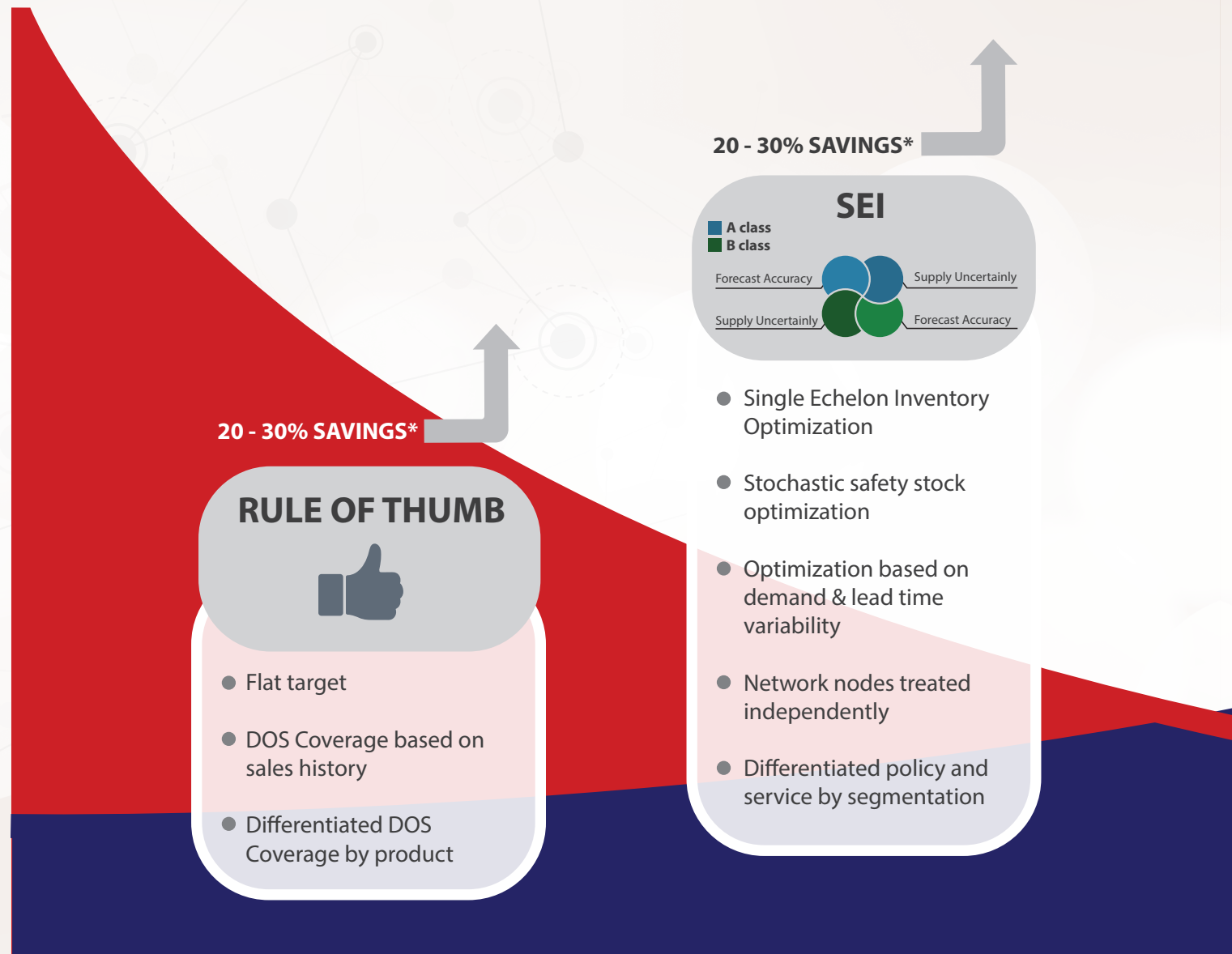
Identifying if your business operates as a single-echelon or multi-echelon business is essential to selecting the right inventory optimization strategy and solution.



Is My Business a Single Echelon or Multi-Echelon Network?



Evolve Your Inventory Strategy with Multi-Echelon Inventory Optimization

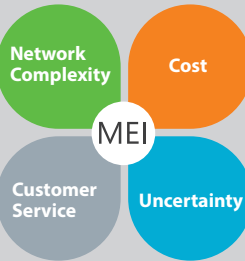


*Sources:

1. Aberdeen. "Supply Chain Inventory Strategies Benchmark Report."
2. Desmet B. "Normal approximations for safety stock optimization in multi-echelon supply chains."

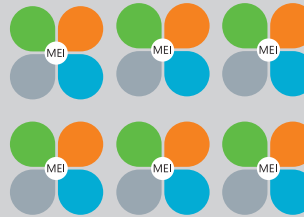
20 - 30% SAVINGS*

INTERNAL MEI



- Multi Echelon Inventory Optimization
- Holistic treatment of interconnected internal supply network
- Differentiated analysis by bill of distribution, bill of material, and product segmentation
- Differentiated analysis by strategic and bottleneck nodes

EXTENDED MEI



- Multi Echelon Inventory Optimization
- Holistic multi-echelon treatment of extended supply chain network
- Extend the multi-echelon optimization to suppliers and customers
- Typical first step: integrate dealers
- First mover advantage is critical

Arkieva Multi-Echelon Inventory Optimizer

The Arkieva Multi-Echelon Inventory Optimizer presents a wide-ranging solution for optimizing safety stock targets by using proprietary inventory optimization algorithms that consider demand and supply uncertainties at each echelon and node.

Quickly Calculate Inventory Targets Across the Network

- **Evaluate tradeoffs** between different service levels strategies
- **Optimize inventory targets** for all materials and locations across a multi-echelon network
- **Utilize flexible settings** for service level definition and service level differentiation
- **Evaluate both distribution networks** (Bill of Distribution and production network)

Get answers on how to distribute your inventory so your overall investment is minimized without jeopardizing service levels.



Answer Key Inventory Optimization Questions in Real-Time. Anytime.

- What are the top 10 SKUs by total cash value on hand?
- What percentage of total inventory investment does this location or product represent?
- Do our inventory costs align with our current demand?
- What inventories are imbalanced by warehouse or region, or are in excess, overage, or slow-to-non-moving?
- What are the appropriate inventory levels to carry for each SKU, and how can those numbers be kept evergreen?
- How will different service levels impact my inventory investment?



Arkieva Tells You What, Where, and How Much to Stock.

Plan. Analyze. Optimize.

The Arkieva Inventory Management Solutions: Inventory Planner, Inventory Analyzer, and Multi-Echelon Inventory Optimizer identify optimal inventory levels by combining different inventory factors needed for creating the right safety stock levels including, demand variability, desired service levels, and lead times.



Arkieva Users Report a 15-20% Permanent Inventory Reduction



How Does Arkieva Help You to Create Optimal Safety Stocks?

- **Integrated Planning Data:** Arkieva integrates with demand, supply, and ERP data to help you optimize your safety stock levels across your entire network.
- **Advanced Inventory Analytics:** The advanced inventory analytics features from Arkieva allow businesses to quickly identify pockets of inventory that hinder cash growth and areas where inventory needs to be increased.
- **Discover the Best-Fit Inventory Method:** Arkieva offers a wide variety of inventory methods for calculating safety stocks. This includes standard inventory methods and 'rule-of-thumb' based methods.
- **Robust Inventory Scenario Building:** Anticipate and plan for different scenarios. Arkieva allows users to create multiple scenarios with different parameters, values, and service levels.
- **On the Fly Data:** Drill-down or up to get detailed analysis or high-level overviews in real-time. Discover answers to key inventory questions by location, material, and type of inventory.
- **Easy-to-Use Solutions:** Run your business as you do today, without the need for change with Arkieva. Arkieva is configurable to fit your existing business processes.

Find out how much cash you can free up right now with Arkieva



Arkieva Rough Cut Capacity Planner (RCCP)

Meet Production Timelines. Align Capacity with Demand.

Transform your forecasts into production capacity plans by aligning key assets with demand. The Arkieva RCCP is an intuitive solution for quickly matching supply with demand to highlight any imbalances. Make informed decisions and create improved medium to long term plans.

The Arkieva RCCP provides you with easy-to-use features for planning over a long horizon; 12-18 months typically grouped in monthly time buckets.

Maximize Capacity Utilization

- ✓ **Improve asset management**
Ensure that you have enough capacity and the right quantity of raw materials.
- ✓ **Get ahead of possible capacity constraint issues**
Answer key capacity planning questions including, "Where should I build my next plant?"
- ✓ **Create enhanced medium to long term plans**
Identify the impact of decisions on demand, production, shipment, projected inventory, and key raw material purchases.

Visualize the Impact of Decisions on Demand, Capacity, and Inventory.

- ✓ **Quick Scenario Planning**
Quickly simulate different what-if scenarios to decide when to make tradeoffs or to negotiate in the long and short term. For example, find out when an extra shift should be added or if demand shouldn't be supplied.
- ✓ **Native Excel Integration**
Want to view or share your rough-cut capacity plans in Excel? No problem. With the click of a button, push your data to Excel and publish your changes back to the Arkieva RCCP tool afterward.
- ✓ **Easy Data Visualization Tools**
Use the Arkieva visualization tools to easily analyze data, evaluate the impact of decisions, and create visually enhanced reports for your management or planning teams.
- ✓ **User Collaboration Tracking**
Easily keep track of user edits, review and approve, or disapprove edits using one centralized location.

- ✓ **Measure Plan Performance**
Find out how well your long-range capacity plan is performing by measuring performance in real-time.
- ✓ **View Data at Different Hierarchies/Aggregates**
View your planning data at your desired hierarchy level. For example, at the product family level.
- ✓ **Integrate Production Scheduling and Capacity Plans**
Gain full visibility from shop floor to shipment schedule. Arkieva RCCP Integrates with the Arkieva Scheduler, allowing you to easily convert your supply capacity plans to a working production schedule or plan.

Arkieva Supply Optimizer

Manage Changes Profitably. Synchronize Supply Operations.

Create profit-driven supply scenarios for rapid responses to marketplace changes, re-plan and increase customer delight. Generate a reduction in inventories up to 20% across the network through less costly overtime, increased throughput, and fewer setups.



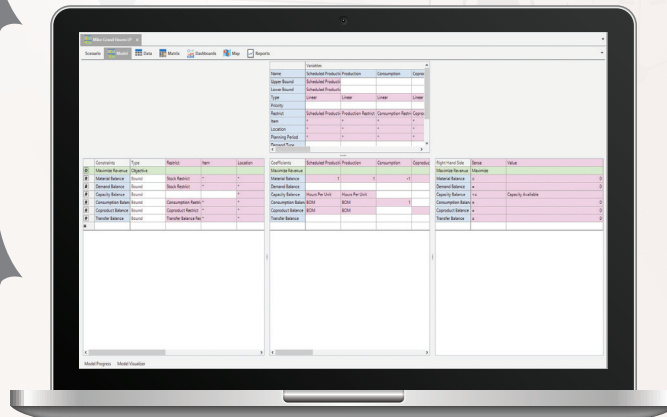
Generate a reduction in inventories up to 20% across the network

Answer Key Supply Planning Questions

What is the most cost-effective way to distribute our product?

Will we be able to cover demand if a shutdown occurs?

Can we accept a significant additional order without disrupting customer service?



How soon should we begin building inventory to support an upcoming promotion?

How should we respond to a spike in raw material costs?

Machine Learning Supply Optimization. Rapid Re-Planning.

- ✓ **Powerful Machine Learning**
Power your supply plan with the comprehensive machine learning features of Arkieva Supply Optimizer for a continuous improvement process.
- ✓ **Supply Chain Modeling**
Create models for your internal and external supply chain across global enterprises; multi-sites and multi-users.
- ✓ **Production Plan Synchronization**
Synchronize material and capacity allocation with production and planned purchases, optimizing operations with true customer demand.
- ✓ **Rapid Re-Planning**
Quickly handle evolving situations involving costs, new growth opportunities, or marketplace changes, while increasing profitability and customer service.
- ✓ **Quick Sandbox to Live Anticipation Planning**
Analyze varying factors such as demand and capacity, and potential external threats to create a profit-driven supply plan that can withstand changes; quickly transform plans from sandbox to live.
- ✓ **Visually Integrated Demand and Supply Reports**
Get a better picture of your supply plan using intuitive, easy-to-use features for comparing and reviewing capacity, and costs using integrated supply and demand reports.



How to Solve Key Supply Planning Challenges



Challenge: Satisfying demand when there are many products manufactured with different Bill of Materials (BOM)

- ✓ Deciding where and how to make products that are made with different recipes and at different facilities.
- ✓ Having different manufacturing methods that may have different yields or products that can be produced at a higher rate on certain machines.
- ✓ Ingredient scarcity or limited capacity sometimes prevents employing preferred manufacturing methods.
- ✓ Selecting products that must utilize secondary recipes in order to satisfy demand.
- ✓ Minimizing costs while meeting demand promptly.



Solution: Optimizer provides a way to utilize all resources efficiently and in a cost-effective manner.

- ✓ **Cost-Effective Manufacturing Method:** The Arkieva optimization model determines the best way to manufacture all the products with the given resources, minimizing the sum of all costs, including unmet demand, cost of production, and inventory cost.
- ✓ **Recipe Prioritization:** Different recipes are prioritized according to standard operating procedures; the model however selects a secondary recipe if it reduces overall costs.
- ✓ **Automatic Capacity Utilization Management:** Automatic computation of amount of capacity used by each recipe for staying within the limited number of available hours.
- ✓ **Build Inventory to Satisfy Unmet Demand in the Future:** Stay one step ahead with the ability to build inventory that meets future demand which might not be satisfied by producing at periods when capacity utilization is low.
- ✓ **Develop an Efficient Global Plan:** Get the visibility needed to create a global supply plan that considers all supply options and improves resource utilization.



Challenge: Satisfying demand when products have different purities

- ✓ Limited capabilities and resources for products that contain key ingredients with varying conditions and come in different concentrations.
- ✓ Difficulty of balancing many different costs of manufacturing considering the almost limitless possibilities of the 'what,' 'how,' and 'where' to produce a product.
- ✓ Creating the best manufacturing plan while looking at transportation costs, inventory limits, inventory costs, and contractual considerations, such as "Take-or-Pay."



Solution: Optimization model examines all production restrictions on supply and capacity and finds the best way to satisfy demand

- ✓ **Best Output with Desired Purity:** The solution model considers the purities and costs of all input streams to find the best way to get output with the desired purity at the lowest cost.
- ✓ **Automatic Contractual Obligation Consideration:** The system automates the cumbersome work of manually considering contractual obligations, balancing revenues with constraints simultaneously.
- ✓ **Supplier Impact Evaluation:** Users can easily examine the impacts of changing suppliers, adding new capacity, or changing demand.
- ✓ **Eliminates Time-Consuming Trial and Error Process:** Arkieva Optimization models have the flexibility of adding assumptions about sourcing and production whenever.



Challenge: Waste minimization during cutting process

- ✓ Part of production process involves cutting larger sizes of products into smaller ones; during that process, it's essential to minimize waste while keeping productivity high.
- ✓ Even a 1% reduction in waste can mean substantial savings.
- ✓ Low waste cutting patterns take much longer to cut or cause major problems for material handling.
- ✓ Semi-finished inventory needs to be in sizes that can be cut efficiently.



Solution: Optimizer provides significant improvements throughout cutting process and lowers total cost

- ✓ **Efficient Combination Pattern Discovery:** The Optimization model finds the combination of patterns that will produce the necessary number of each size with minimum cost.
- ✓ **Total Cost Minimization:** While minimizing waste is important, it shouldn't be the sole cost function component. The solution model looks at resource usage including setup, processing time, and inventory to determine the best way to minimize cost.
- ✓ **Inventory Reduction While Reducing Waste:** The model considers the inventory issue of producing extra sizes that fit within a pattern that might not be used.
- ✓ **Production Optimization:** The Planning solution evaluates larger and downstream patterns to reduce the problem of producing wider widths upstream that could result in downstream waste.

Arkieva Finite Scheduler

Visualize the Entire Production-Distribution Chain—Shop Floor to Shipment.

Constantly changing pressures, shifting priorities, last minute requests from key customers, material availability problems, or machine breakdowns can suddenly render all those hours and hours spent creating a workable schedule into wasted time.

Track Production. Increase Facility Utilization.

Enhance your unique production scheduling process with the power and flexibility of the Arkieva Finite Scheduler. The Scheduler is an easy-to-use solution that is designed for all manufacturing operation types – discrete, batch, or continuous.

- **Track production activities** for many products.
- **Increase facility utilization** from improved flow of materials.
- **Improve inventory position** by better lot sizing.
- Create a **faster, reliable production schedule**.

- **Instantaneous schedule generation** with the Finite Scheduler's ability to encode rates, initiate changeover times, create multi-level BOMs, enable routing, and employ capacity constraints.
- **Rule-based and manual changes** for responding to last minute emergencies or integrate specific activities into the schedule.
- **Powerful Visualization and Reporting** for creating visual reports of your production schedule which can be exported or saved.

Synchronized Material Flow. Continuous Time-Production.

- **Intuitive Drag-and-Drop Planning Display**
The Finite Scheduler has planning grid displays that allow for intuitive drag-and-drop grid display for easily and quickly moving activities around when needed.
- **Create and Update Soft Allocation or Soft Pegs On-the-Fly**
Any schedule change immediately creates soft pegs that update available-to-promise, violation, and inventory displays.
- **Inventory Shortage Visibility**
Color coded display to highlight shortages or targets exceeded.



- **Product Availability Reports**

View day-by-day inventory turns and analyze inventory trends.

- **What-if Scenario Integration**

Answer different scheduling scenario questions including if production can be increased, how schedules would change if resources are altered, among others.

- **Continuous Time-Production Schedules**

Maintain a continuous time-production schedule with activities synchronized to maintain smooth material flow.

- **Easy Production Schedule Modification**

Easily modify production schedule to reflect changes in production yield, equipment availability, and order acquisition.

- **In-depth Impact Analysis**

Evaluate the impact of proposed changes in production capability including shutdowns and manpower change, before committing.

- **Real-Time Schedule Change Alerts**

Get alerts when transactional data about the production process diverge from the schedule.

- **Cross-Functional Visibility and Collaboration**

Create a more collaborative scheduling process with visibility features for cross-functional teams—schedulers, production supervisors, and customer service representatives.

Arkieva Order Promiser

Discover More Ways to Say “Yes” to Pending Orders.

Find more ways to say “yes” to orders promised to a customer. The Arkieva Order Promiser has advanced available-to-promise functions that go beyond just a “yes/no” response that’s aligned with primary company goals.

Track Orders in Jeopardy. Create Alternative Fulfillment Strategies.

- **Improved Visibility**

Gain complete visibility into the supply chain with more options to create a successful order promising process.

- **Create Alternative Fulfillment Strategies**

Implement alternative fulfillment strategies for equivalent products, shipment locations, and production resources.

- **Interactive Reports for Increasing Customer Delight**
Create interactive reports that provide a wide variety of order resolutions to help maintain customer satisfaction.
- **Inventory Allocation Rule Modification**
Select from various allocation rules, modify allocation rules, and work to meet order promises.
- **Multilevel Network-based CTP and ATP**
Create a multilevel-network-based, available-to-promise (ATP) and capable-to-promise (CTP) process that considers manufacturing capacities, work in progress (WIP), and raw materials availabilities and lead times physical and projected finished goods inventory.
- **Configured Order Promising and Tracking**
Configure order promising and track end-item capacity and materials.
- **Real-Time Order Promising**
Provide an order delivery date to customers, considering known finished goods inventory projections with near-real-time to real-time ATP checks.
- **Bill-of-Distribution Explosion and Rebalancing**
Specify how make-to-order (MTO) products are distributed internally while considering what's available within the distribution center network.
- **Order Management System Integration**
Integrate ERP or order management systems with Arkieva Order Promiser to enable transmission of order-promising data from transactional system.
- **Customer Demand Prioritization for Responsiveness**
Improve demand responsiveness by prioritizing specific customer demand priorities with projected inventory.

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