Material Requirement Planning Simulation for Manufacturing

Simulate scenarios and evaluate planning outcomes before execution

Material Requirements Planning (MRP) simulation is a core capability in modern ERP systems, enabling manufacturers to model supply-and-demand scenarios, test planning decisions, and optimize resource utilization across complex, global supply chains. As organizations face increasing volatility and disruption, MRP simulation has become a strategic investment lever; helping manufacturers improve agility, reduce risk, and make confident decisions before committing execution.

In environments where demand, supply, and production conditions change rapidly, planning decisions are often required without full operational certainty. MRP Simulation provides a controlled, risk-free environment to evaluate scenarios and perform structured "what-if" analysis without impacting live operations; supporting informed, proactive production and supply decisions before they are put into action.

The Planning Decisions Manufacturers Must Make

MRP Simulation supports planning decisions across strategic and operational activities, including:

- Responding to updated demand forecasts
- Evaluating new sales opportunities or lost orders
- Securing supplier capacity
- Identifying alternative sourcing options
- Planning workforce hiring and shift schedules
- Balancing workloads across departments
- Identifying production bottlenecks

These decisions are part of regular planning cycles and require comparing alternative outcomes before execution.

Why MRP Simulation Matters

Planning decisions require evaluation of alternative outcomes

Scenario-based evaluation supports structured planning decisions

Demand, supply, and capacity conditions change over time

Simulation enables comparison of planning alternatives before execution

How MRP Simulation Fits into the Manufacturing Planning Flow

Material Planning Simulation fits into a broader planning flow that begins with a Sales and Operations Plan (S&OP) or a Demand Planner forecast that is imported into Master Scheduling (MS). After running MS and reviewing key results, capacity feasibility is checked with Resource Requirements Planning (RRP), and the Master Production Schedule is adjusted as needed. When demand, capacity, and the overall plan are aligned, an MRP Simulation is run to analyze material availability and assess planning outcomes. MRP Simulation can also be used independently to evaluate scenarios without executing the full planning flow.

Key capabilities

Parallel Planning Simulation

Evaluate multiple planning alternatives without disrupting live operations.

- Run simulations in isolated planning environments
- Execute multiple planning scenarios simultaneously
- Compare planning alternatives side-by-side
- Maintain full separation between simulated and live operational plans

Flexible Demand Scenario Modeling

Test how changing demand conditions affect planning outcomes.

- Modify demand quantities and required dates
- Introduce hypothetical demand conditions
- Re-run simulations using stored planning data
- Evaluate production readiness under changing demand scenarios

Capacity Impact Simulation

Assess how planning changes affect production resources.

- Simulate machine resource loads
- Simulate labor resource loads
- Apply the same scheduling logic used in live planning
- Compare resource utilization across alternative scenarios

Time-Phased Planning Visibility

Analyze planning behavior across structured time horizons.

- Aggregate supply and demand into defined planning periods
- Review projected inventory balances
- Evaluate capacity utilization over time
- Compare performance across multiple planning scenarios

Exception Identification and Planning Review

Identify planning outcomes that require operational attention.

- Review supply-demand alignment
- Identify planning exceptions
- Highlight required planning responses
- Compare scenario outcomes to support planning decisions

IFS MRP Simulation helps manufacturers move from reactive planning and costly firefighting to scenario-based decision-making, improving plan confidence, supply resilience, and service performance. As a supply chain planner, establish a trusted planning baseline, compare scenarios, quantify trade-offs, and make the best decisions **before shortages, delays, or excess inventory impact the business.**