



Oracle Advanced Planning and Scheduling R11*i*

Volume 1 Instructor Guide

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A Practices and Solutions

B Case Study

1

Oracle Advanced Planning and Scheduling

Foundation

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Objectives

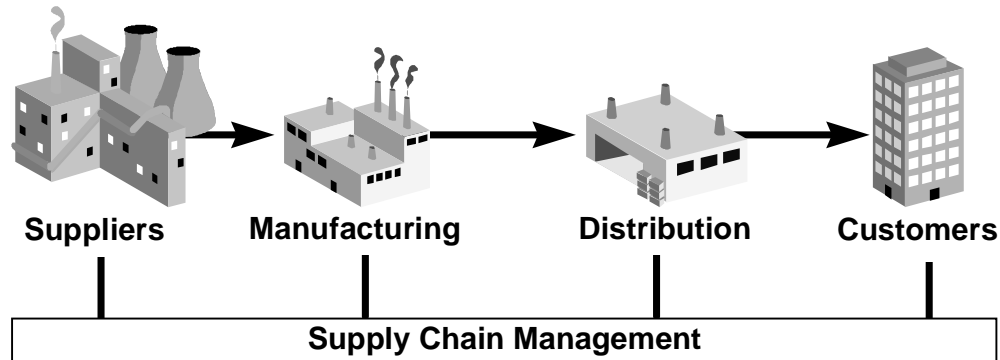
After completing this lesson, you should be able to do the following:

- **Discuss supply chain optimization topics using common industry terminology**
- **Illustrate optimization concepts using a graphical linear programming (LP) model**
- **Optimize a mathematical LP model using a solver**

Foundation Topics

- Definition of terms
- Guided practice: Graphical linear programming
- Examples of available solver technology

What Is Supply Chain Management?



1-3

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Definition: Supply Chain Management (SCM)

According to the Gartner Group, supply chain management is “orchestrating a concert of resources to manage the process of creating and fulfilling the market’s demand for goods and services.”

Current supply chain planning technology coordinates a system that spans the supply chain from supplier to manufacturer to distribution to end user. The next-generation technology, advanced supply chain planning (ASCP), creates coordinated plans for all of the supply chain activities.

Features of Oracle ASCP are:

- Rapid implementation and fast time to benefit
- Synchronized strategic, tactical, and operational planning and execution
- Global visibility, Internet-based collaboration
- “What-if” scenario comparison and analysis for decision support
- Sophisticated solving techniques to optimize benefits for the system
- Order-of-magnitude computer response performance improvement
- Control mechanisms provided for real-time monitoring of execution
- Immediate response to deviations from optimal performance

Terms

- **Virtual enterprise**
- **Collaboration**
- **Mass customization**
- **Finite scheduling**
- **Synchronization**
- **Mixed-mode manufacturing**
- **Holistic planning and scheduling**



Definitions

A virtual enterprise is a group of organizations brought together for a specific market opportunity. Each member of the alliance brings talents and resources to the group.

Collaboration is the sharing of information, usually among alliance partners, resulting in informed decision making and coordinated productive effort. Partners jointly plan, optimize, execute, and monitor performance. The performance of each entity of the supply chain is visible in real time.

Mass customization is a business environment that rapidly responds to customer demand. It provides the best features of customized production and mass production. The customers get the custom product features they want at near the low prices and fast service typical of mass production.

Capacity requirements planning (CRP) calculates production resources required by the master production schedule (MPS), based on the assumption that those resources will be made available over the mid-term planning horizon. Finite scheduling seeks a near-term, feasible, but not necessarily optimal schedule, taking the existing manufacturing resources as a constraint. Oracle uses the term *constraint-based planning* (CBP) to encompass finite scheduling functionality.

Terms

- **Virtual enterprise**
- **Collaboration**
- **Mass customization**
- **Finite scheduling**
- **Synchronization**
- **Mixed-mode manufacturing**
- **Holistic planning and scheduling**



Definitions (continued)

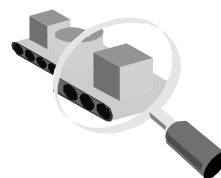
The term *synchronization* is used in a variety of ways. One meaning is to coordinate long-range, medium-range, and short-range plans so that they are in concert, working toward compatible objectives. Synchronization can also refer to centrally coordinated planning for decentralized transaction and execution systems. Finally, it can mean that a system of material supply and production line rates are driven by customers' demand.

Mixed-mode manufacturing refers to operating some combination of discrete, flow, process and project production strategies within one environment. For example, a company currently produces items in batches or small lots. It uses work orders to authorize and track discrete manufacturing processes. Now say that this company has identified a product family of relatively high-volume items that share similar routings. If the volume of the product family is high enough to justify dedication of its own production equipment, the product family can be produced more efficiently in a flow line. The result is a mixed-mode manufacturing facility containing both discrete and flow production capability. Oracle ASCP simultaneously supports the spectrum of project, discrete, flow, and process manufacturing.

Holistic planning and scheduling refers to a complete global solution that brings everything together. It provides synchronization in all senses of the term for a mixed-mode, virtual enterprise.

What Is Optimization?

- **The optimal solution to a model best satisfies the objective criteria**
- **A model represents the essential elements of a system**
- **Objective criteria are used to evaluate alternative feasible solutions**
- **Feasible solutions satisfy all of the system constraints**



Optimization Terms

The optimal solution describes a single course of action that is expected to result in the most beneficial outcome. There are several caveats for this definition.

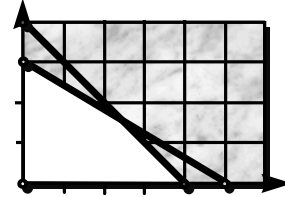
First, the optimal solution is almost always found by manipulating a model of a real system. To the extent that the model does not represent the real system in every detail, the solution to the model will not necessarily be exactly the same as the solution to the real system. There are many kinds of models. Examples include architectural scale models of buildings, electronic circuit models of mechanical systems, graphical models, and mathematical models. A model represents the essence of a real system, but it does not, and should not, duplicate the real system in every detail. As detail is added, the model rapidly becomes more complex and becomes more difficult to manipulate. At the extreme, the very detailed model becomes so unwieldy to manipulate that alternatives cannot be simulated.

The objective criteria is a list of desired goals and outcomes and forms the basis for comparing alternative feasible solutions. Many optimizing techniques score alternative solutions on the basis of a single objective, such as best customer service or minimum inventory investment or greatest profit. Advanced optimization techniques provide for weighted scoring to find the solution that best fits a combination of objectives.

A solution is not feasible unless it simultaneously satisfies all of the constraints. It is possible to have so many constraints that no feasible solution can be found. When no feasible solution exists within the given constraints, Oracle ASCP will force the solution to be feasible by moving the production date out beyond the promised order due date. In other words, when the choice is between missing a due date or creating no solution at all, the system will miss the due date.

What Is Optimization?

- **Constraints specify feasibility boundaries for the solution to the model; for example:**
 - **Resource constraints limit the ability to produce**
 - **Market constraints limit the ability to sell**
- **Assumptions state conditions that must be met for the solution to be valid**



Constraints and Assumptions

Constraints bind solutions to reality. Without constraints, optimal solutions have no meaning. For example, say the objective of a grocery business is to maximize profits. If the grocer buys apples for \$0.50 each and sells them for \$0.75 each, the optimal solution is to buy and sell an infinite number of apples and become infinitely wealthy. The optimal solution is meaningless because it does not recognize that the supply of apples and the market for apples are bounded, or constrained, to something less than infinity.

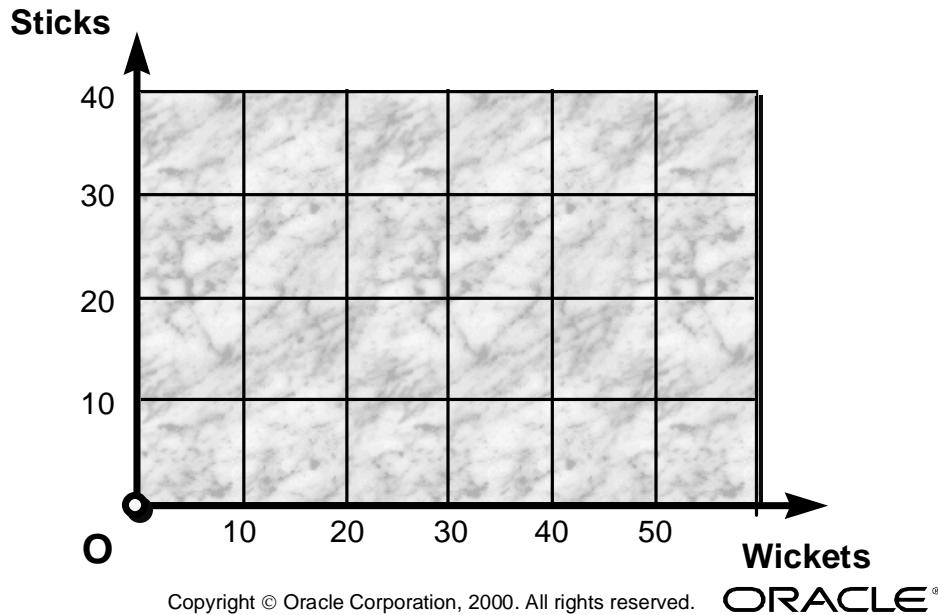
Other examples of constrained resources include:

- Labor, considering skills, certification, contract limits, and so on
- Machines, considering maintenance time, ability to achieve required tolerances, and so on
- Transportation, considering mode, weight and volume capacity, lead time, and so on
- Finance, considering inventory investment policy, cost, limited ability to raise capital, and so on

Assumptions form a validity checklist. The concept of validity is different from the concept of feasibility. Sometimes when a solution is implemented, the results are disappointing. The source of the disappointment can usually be traced to a false assumption that was made while creating the model. Based on the assumptions, the solution is correct. But if an assumption is false, we have found the correct solution to a wrongly stated problem. The model is not a valid representation of the real system.

Linear Programming Guided Practice

- Plot points A and B
- Connect the points with a straight line



Purpose

The purpose of this practice is to demonstrate the concepts of optimization, feasibility, constraints, and assumptions. This practice uses a graphical model to simulate a simple production decision.

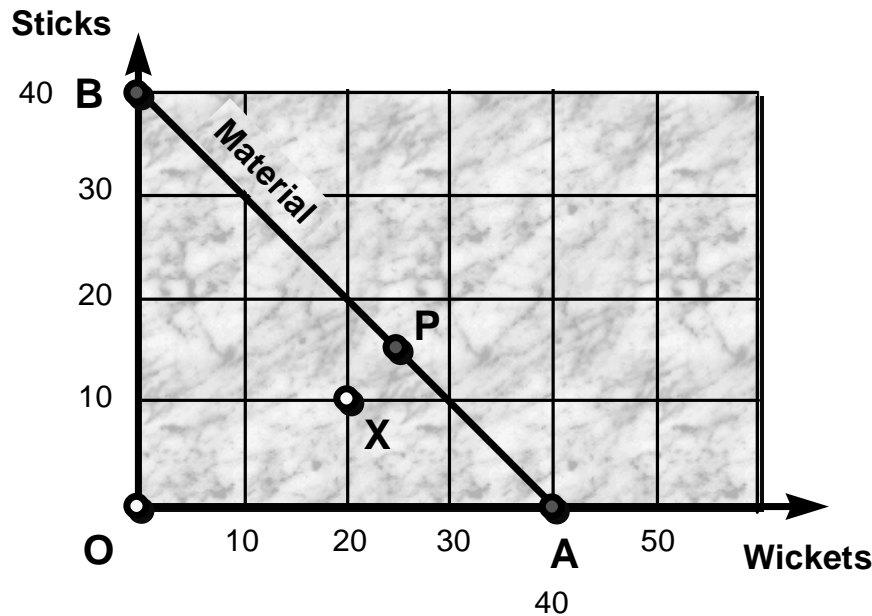
Scenario

Sticky Wickets is a manufacturer of engine oil dip sticks and croquet wickets. Their objective is to maximize revenue from sales. Per unit prices for dip sticks and croquet wickets are \$0.15 and \$0.10, respectively. The supply of metal wire used in the manufacture of sticks and wickets is limited to 24 meters. This is an example of a constraint on material resources. The manufacture of each stick and each wicket consumes 60 cm (0.6 meters) of wire.

- If Sticky Wickets decides to make only croquet wickets, how many wickets could the company make with the available supply of metal wire? ____
- On the other hand, if the company made only engine dip sticks instead, how many could it make? ____
- On the above graph, the horizontal axis represents the number of wickets, and the vertical axis represents the number of sticks. Plot the answers to parts (a) and (b) on the graph and label the points A and B, respectively.

The result is shown on the next page.

LP Material Constraint



1-9

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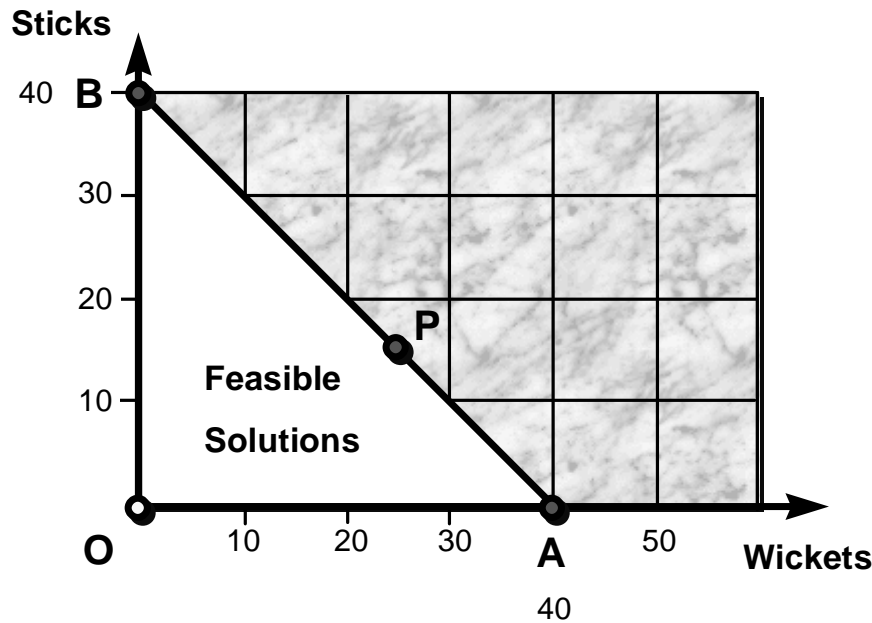
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Scenario (continued)

When you connect points A and B, you have constrained the solution to the area included within the right triangle, OAB. Twenty-four meters is enough wire to make 40 sticks or 40 wickets, or any combination of sticks and wickets that falls on the line AB. Production of any combination of sticks and wickets that is above the line AB is impossible, because there is not enough material.

Any point within or on the boundary of the triangle is feasible. For example, it is feasible for Sticky Wickets to do nothing, which is represented on the graph by the origin point, O. But that would not produce any revenue. Alternative feasible solutions are represented by points A (make 40 wickets), B (make 40 sticks), P (make 15 sticks and 25 wickets), or any interior point of the triangle such as X (make 20 wickets and 10 sticks). However, in the case of point X, some of the available material resource (wire) will be unused. It will turn out that the best course of action is to continue production until the company runs out of resources. The optimal solution will be found somewhere on the boundary defined by the line AB.

Feasible Region



1-10

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Scenario (continued)

Adding Another Constraint

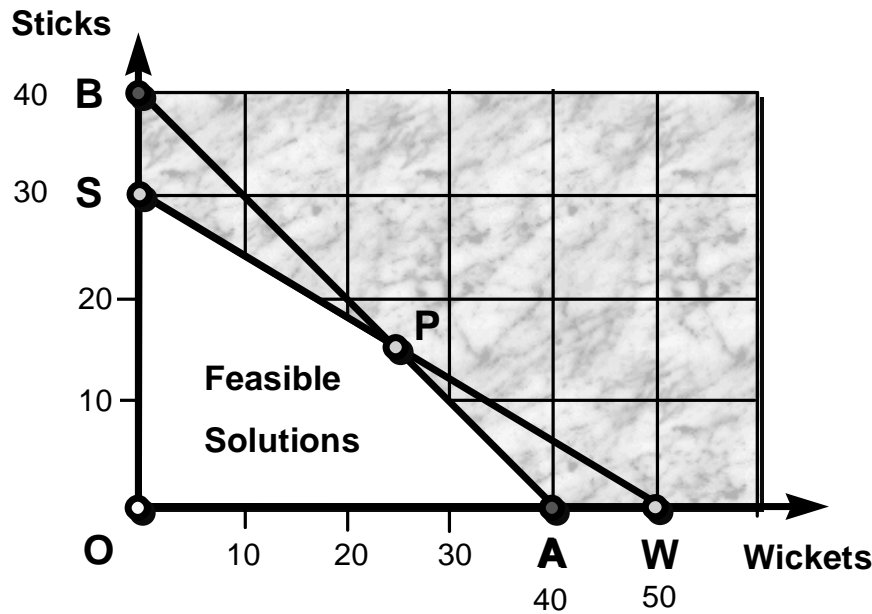
Now say that Sticky Wickets' production time is limited to 300 minutes. This is a labor resource constraint. It takes 10 minutes of labor to make a dip stick, and 6 minutes of labor to make a wicket.

- d. If Sticky Wickets decides to make only croquet wickets, how many wickets could the company make with the available supply of labor? _____
- e. On the other hand, if the company made only engine dip sticks, how many could it make? _____
- f. On the above graph, the horizontal axis represents number of wickets, and the vertical axis represents the number of sticks. Plot the answers to parts (d) and (e) on the graph and label the points W and S, respectively.
- g. Connect points W and S with a straight line.

Hint: The new line SW will intersect line AB at point P.

The result is shown on the next page.

LP Resource Constraint



1-11

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Feasible Solutions

There is enough labor to make 30 sticks or 50 wickets, or any combination on the line SPW. Now the feasible area, OAPS, is smaller than before. Point B is no longer feasible because, although there is still enough wire to make 40 sticks, there is only enough labor to manufacture 30 sticks. Point W is not feasible because, although there is enough labor, there is not enough material to make 50 wickets. Feasible solutions must simultaneously satisfy *all* constraints.

The optimal feasible solution will occur at the boundary defined by APS. Actually it will be found exactly on one of those three points: A, P, or S. Now we need a way to evaluate those three points to determine which of them really is the best solution. This is where the objective criteria comes in. In this example, the objective is to maximize revenue. Recall that the prices per unit of sticks and wickets are \$0.15 and \$0.10, respectively. Revenue is price times volume produced (and presumably sold).

LP Objective: Maximize Revenue

Point	Wickets @ \$0.10	Sticks @ \$0.15	Total Revenue
A	40	0	\$4.00
P	25	15	\$4.75
S	0	30	\$4.50

Optimal Solution

The greatest revenue is obtained at point P, by producing (and selling) 25 wickets and 15 sticks:

$$(25 \text{ wickets} \times \$0.10) + (15 \text{ sticks} \times \$0.15) = \$4.75$$

What if Sticky can't really sell 25 wickets?

Then the model is invalid. We have assumed that everything produced will be sold. To resolve this, market constraints could be added to the model. For example, a market constraint limiting sales to 20 or fewer wickets could be added to the graph. That would further restrict the area of feasible solutions and would change the answer. To keep this simple, we will not add the market constraint.

Optimal Solution

- **Use the available resources to produce 25 wickets and 15 sticks**
- **Assumptions:**
 - **Constraints are linear and continuous**
 - **Single, linear objective**
 - **Only two decision variables: sticks and wickets**

A “Sticky Wicket”

Now say that a lot sizing rule constrains production lot size to a multiple of seven. Our assumptions are that all constraints are linear and continuous. This presents a problem, or “a bit of a sticky wicket.” Lot sizing forms discontinuous constraints, which violate the assumptions. As you will see below, when assumptions are false, the method is no longer guaranteed to find the best answer.

If we simply round off the previous solution to the nearest multiple of 7, (28 wickets and 14 sticks), we violate the material constraint: $(28 * 0.6 \text{ m}) + (14 * 0.6 \text{ m}) = 25.2 \text{ m} > 24 \text{ m}$. The rounded solution is infeasible because it requires more than the available 24 m of wire material.

If, instead, we round down (21 wickets and 14 sticks), the revised solution remains feasible:

$$(21 \text{ wickets} \times \$0.10) + (14 \text{ sticks} \times \$0.15) = \$4.20$$

However this is not the optimal answer. The optimal answer, given the lot multiple constraint, is:

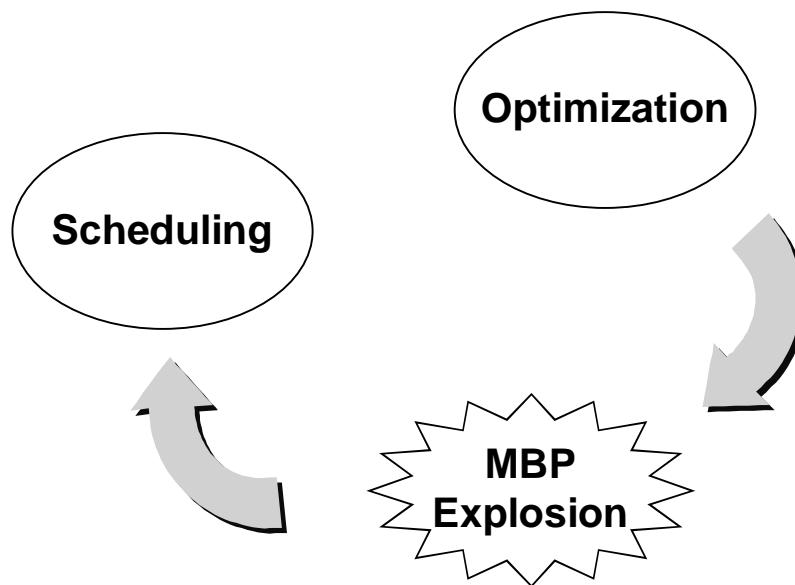
$$(14 \text{ wickets} \times \$0.10) + (21 \text{ sticks} \times \$0.15) = \$4.55$$

The optimal answer cannot be found by simply rounding the previous answer to account for lot size rules. Finding the optimal solution requires use of a fairly complex heuristic in conjunction with the linear programming technique.

Graphical Model Limitations

Use of graphical linear programming models is limited to unrealistically simple decision situations. The simplex method of linear programming is a mathematical model that works in much the same way as the graphical model we have just seen. However, the mathematical model is more robust. It is unlimited in the number of decision variables (products) that can be considered.

ASCP Planning Cycle



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Three-Phase Optimization Process

Recall that the optimal solution is found right at the boundary of feasible solutions. In this example, rounding the solution to the nearest multiple of 7 resulted in an answer that violated the material constraint. This situation was carefully contrived to show that it is possible to add a nonlinear constraint, such as the lot multiple of 7, that can bump the solution over the line into the infeasible area.

To deal with this possibility, Oracle Advanced Supply Chain Planning (ASCP) employs a user-transparent, three-phase optimization process.

1. Oracle supply chain optimization (SCO) uses optimization techniques to determine sourcing decisions and generate time-phased supplies to meet demand.
2. The output of SCO is entered into the memory-based planner (MBP), which creates production and distribution plans at all organizations and generates pegging information at all levels. In this step, lot sizing and other nonlinear factors in the explosion process can result in an infeasible plan.
3. The third step uses a high-level scheduler (HLS) to load and repair the output of MBP to arrive at a balanced and executable (feasible) schedule in each of your facilities over the short-, middle-, and long-range planning horizons.

The first and third phases of this user-transparent process are calculated using proprietary linear programming, solver, and optimization heuristic components supplied by ILOG S.A., of Gentilly, France.

Solver Technology

<http://www.quicken.com/retirement/planner/>

What-If

You may change the following assumptions and then 'Recalculate' to see how they affect your plan ([explain](#)), or click 'Solve' to have the planner solve for a value that will make your plan work ([explain](#)).

	Yourself		Spouse	
Retirement age	<input type="text" value="58"/>	<input type="button" value="Solve"/>	<input type="text" value="51"/>	<input type="button" value="Solve"/>
401k Contribution	<input type="text" value="14"/> %	<input type="button" value="Solve"/>	<input type="text" value="6"/> %	<input type="button" value="Solve"/>
IRA Contribution	\$ <input type="text" value="0"/>	<input type="button" value="Solve"/>	\$ <input type="text" value="0"/>	<input type="button" value="Solve"/>
Roth IRA Contribution	\$ <input type="text" value="0"/>	<input type="button" value="Solve"/>	\$ <input type="text" value="0"/>	<input type="button" value="Solve"/>
			Household	
Taxable Contribution			\$ <input type="text" value="0"/>	<input type="button" value="Solve"/>
Pre-retirement rate of return			<input type="text" value="7.0"/> %	<input type="button" value="Solve"/>
Post-retirement rate of return			<input type="text" value="7.0"/> %	<input type="button" value="Solve"/>
Annual expenses in retirement			\$ <input type="text" value="50000"/>	<input type="button" value="Solve"/>
<input type="button" value="Recalculate"/>				
<input type="button" value="Back"/> <input type="button" value="Next"/>				

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Solver Example

Solvers typically maximize or minimize one cell of information given a model described by a set of other information.

At the referenced free Quicken Web site, you can enter your birth date, savings plans, assets, inflation and interest rate assumptions, retirement income requirements, and so on. Given that information, a solver calculates your retirement age. Or you can set your retirement age goal and have the solver calculate the rate of interest your investments must earn. Or you can set the interest rate and solve for annual retirement income. There are many cells of information. You set all of them except for one as given information, and the solver determines the required value for the remaining adjustable cell.

Electronic Spreadsheet Solver

Microsoft Excel 7.0a Answer Report
Worksheet: [Solver.xls]Sheet1
Report Created: 6/25/99 7:46

Target Cell (Max)

Cell	Name	Original Value	Final Value
\$D\$1	Maximize Revenue	0	4.75

Adjustable Cells

Cell	Name	Original Value	Final Value
\$D\$2	Sticks	0	15
\$D\$3	Wickets	0	25

Constraints

Cell	Name	Cell Value	Formula	Status	Slack
\$D\$4	Material Constraint	24	\$D\$4<=24	Binding	0
\$D\$5	Labor Constraint	300	\$D\$5<=300	Binding	0

	A	B	C	D
1	Maximize Revenue			4.75
2	Sticks			15
3	Wickets			25
4	Material Constraint			24
5	Labor Constraint			300

Solver Parameters

Set Target Cell:

Equal to: ☒ Max ☐ Min ☐ Value of:

By Changing Cells:

Subject to the Constraints:

Add Constraint

Cell Reference: Constraint:

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Excel Solver

Excel has a generic solver, but you must correctly formulate the model. The following process will create a mathematical model and solve the Sticky Wickets problem. Open an Excel spreadsheet and precisely enter the following information:

Cell	Value		Cell	Value
A1	Maximize Revenue		D1	$=(0.15*D2+0.10*D3)$
A2	Sticks		D2	
A3	Wickets		D3	
A4	Material Constraint		D4	$=(0.6*D2+0.6*D3)$
A5	Labor Constraint		D5	$=(10*D2+6*D3)$

From the menu bar, select Tools—>Solver.

Set Target Cell:

Select the Max radio button

By Changing Cells:

Subject to Constraints: Click the Add button

Cell Reference Click the Add button

Cell Reference Click Ok

Click the Solve button. Request the Answer report. Click Ok. At the bottom of the spreadsheet, click the Answer Report tab to see the solution details. This should exactly match the graphical solution.

Summary

In this lesson, you should have learned how to:

- **Discuss supply chain optimization topics using common industry terminology**
- **Illustrate optimization concepts using a graphical linear programming (LP) model**
- **Optimize a mathematical LP model using a solver**

Summary

This preview defines several common optimization terms and concepts. It uses a graphical model to illustrate optimization, objectives, constraints, feasibility, and validity concepts.

Two solvers are shown. The Quicken solver illustrates a user-friendly format that makes it easy to enter a model for a specific type of problem (retirement planning). The Excel solver can be used to solve a broad range of problems, but relies on user expertise to correctly formulate the model. This task becomes very difficult and tedious when the modeled system is complex. The Oracle solver provides a user-friendly format with the ability to model a variety of supply chain systems.

Practice 1-1 Overview

This practice covers the following topics:

- **Defining terms**
- **Drawing a demand constraint**

Performing Practice 1-1

For detailed instructions on performing this practice, see Practice 1-1 in Appendix A, “Practices and Solutions.”

2

Oracle Advanced Planning and Scheduling

Overview

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Objectives

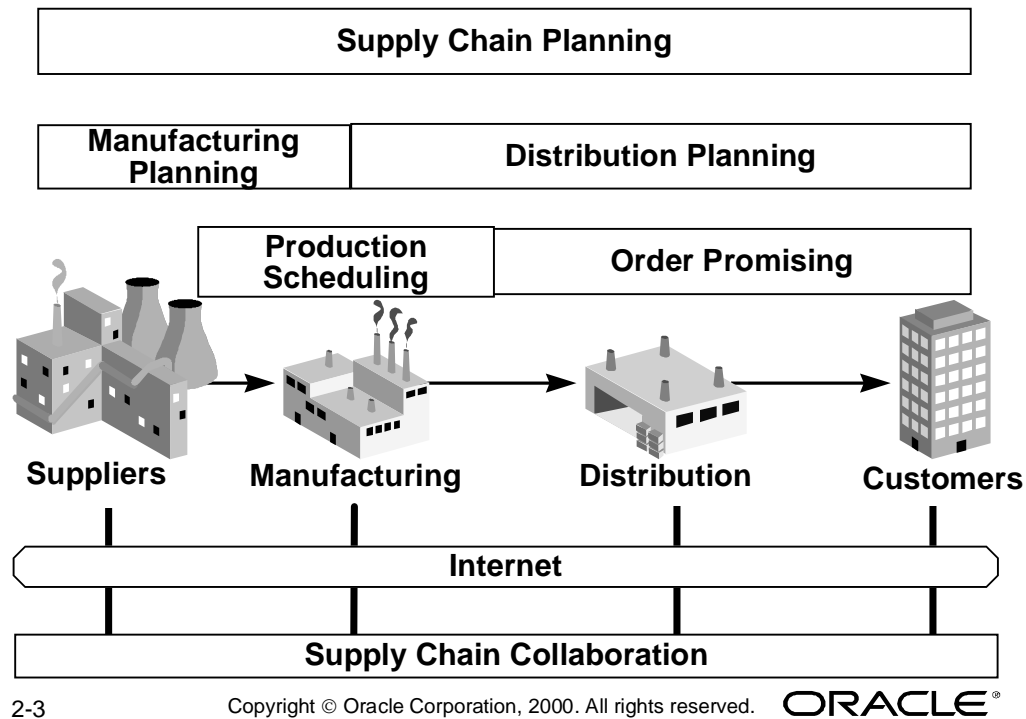
After completing this lesson, you should be able to do the following:

- **Describe the elements and functions of Oracle Advanced Planning and Scheduling (OAPS)**
- **Sketch the architecture of OAPS**
- **Explain how OAPS interacts with other application modules**
- **Describe the benefits of OAPS features**

Overview Topics

- Evolution of enterprise resource planning (ERP) systems
- Business drivers and needs addressed by advanced planning systems (APS)
- History of the Oracle Advanced Planning and Scheduling (OAPS) solution
- Components commonly included in advanced planning systems
- General description of the four products within the Oracle APS suite
- Overview of Oracle APS features and benefits

Advanced Planning Systems



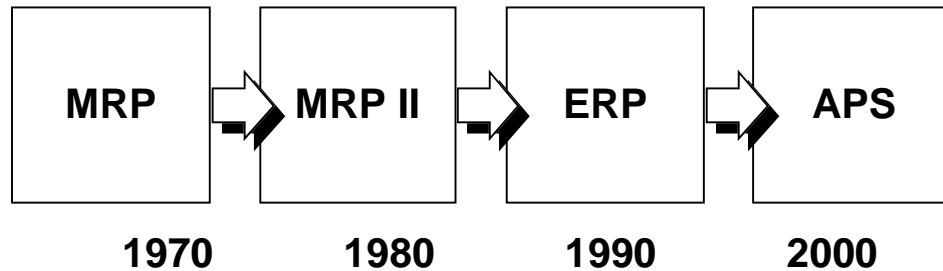
What Are Advanced Planning Systems?

Current supply chain planning technology coordinates a system that spans the supply chain from supplier to manufacturer to distribution to end user. Features of Oracle's next-generation technology are:

- Rapid implementation and fast time to benefit
- Synchronized strategic, tactical, and operational planning and execution
- Global visibility, Internet-based collaboration
- "What-if" scenario comparison and analysis for decision support
- Sophisticated solving techniques to optimize benefits for the system
- Order-of-magnitude computer response performance improvement
- Control mechanisms provided for real-time monitoring of execution
- Immediate response to deviations from optimal performance

Oracle Advanced Supply Chain Planning (ASCP) enables companies to generate constrained and optimized multifacility plans across their entire supply chain. Companies have real-time access to determine their supply and demand positions across every facility and location within their supply chain, whether internal or external. Using advanced simulation capabilities, plans quickly generated by Oracle ASCP can be reviewed and compared to other plans. Most important, by integrating performance management capabilities, supply chain plan performance can be measured and evaluated based upon graphical display of key performance indicator (KPI) information. KPIs provided with ASCP include inventory turnover, on-time delivery, plan profit, and resource utilization.

Planning System Evolution



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Evolution of Planning Systems

Material requirements planning (MRP)—1960s and 70s:

- Material requirements planning
- Master production scheduling
- Capacity requirements planning
- Unconstrained

Manufacturing resource planning (MRP II)—1980s:

- Unconstrained
- Manufacturing planning and control, with manual iterations to “close the loop”
- Financial integration

Enterprise resource planning (ERP)—1990s:

- Integrated enterprise resource planning
- Constraint-based planning
- Organization optimization
- Supply chain simulation

Advanced planning systems (APS) for e-business—2000:

- Holistic optimization
- Collaborative supply chain planning
- Integrated planning and execution
- Integrated performance management
- Integrated with customer relationship management
- Rapid return on investment

Oracle Advanced Planning and Scheduling R11i 2-4

Evolution of Advanced Planning Systems

- **MRP/MRP II**
- **Fast, cheap computing power**
- **Finite capacity scheduling**
- **Supply chain**
- **Optimization**



Evolution of Planning Systems (continued)

At the time MRP was gaining acceptance, automation was decreasing labor's share of the cost of goods sold. As direct labor costs slipped to a distant third in importance, behind purchased material (about 60%) and overhead (about 25%), MRP focused on ordering the right quantity of the right material at the right time. Implementations where top management support, user education, and discipline combined to attain accurate inventory, bill, and routing data were rewarded with reduced inventory investment and increased customer service.

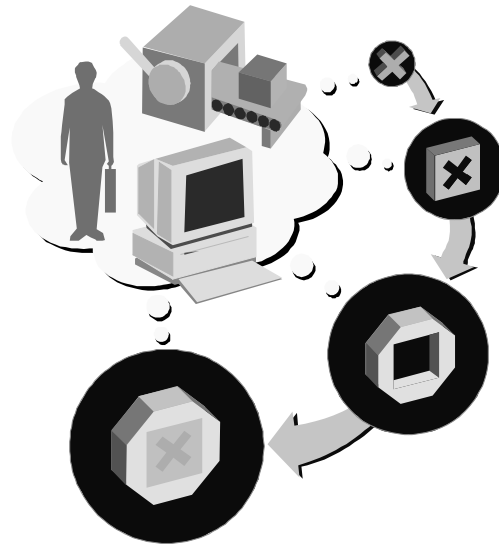
Manufacturing job shop facilities of the time had low equipment utilization rates, so it was a fair assumption that capacity was plentiful, and where it was not plentiful, customers expected to wait a long time for their demands to be fulfilled. Few were motivated to go through the sequential and iterative MPS/MRP/CRP process to make the best use of abundant capacity.

As systems developed, material transactions were integrated with financial systems, and then those systems expanded into enterprise-wide resource planning systems. Increased computing speed was roughly matched by increased demand for enterprise resource planning, and there never seemed to be enough computing power to implement finite capacity scheduling.

Global competition provided the motivation, and faster, cheaper computing resources eventually made it possible to finite schedule capacity in the short-term. Then the perspective changed: from scheduling individual resources, to cross-functional resources, to a supply chain of resources crossing enterprise boundaries. Advanced supply chain planning systems have raised the bar from calculating a local feasible plan to achieving supply chain optimization while at the same time increasing the scope from short-term scheduling to synchronization of strategic, tactical, and operational planning and execution.

Business Drivers

- **Competition**
- **Customers**
- **Virtual enterprises**
- **Mass customization**



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Key Trends Driving Supply Chain Management Strategy

Competition

It has been said (and said again): “The Internet changes everything!” As a result of the Internet, competition is changing and may come from unsuspected sources. Traditional barriers to market entry are disappearing. Geographic proximity is becoming irrelevant, and new distribution channels are emerging. The trend toward customer self-service is changing the customer relationship. Now the customer can use a Web browser to inquire about quotes, availability, invoicing, and shipment tracking.

Customers

Customers are better informed, and expectations are higher than ever. In addition to the classic 4 Ps of marketing—product, promotion, place, and price—today’s markets also require rapid response, reliable delivery, the right quality, capacity flexibility, and service.

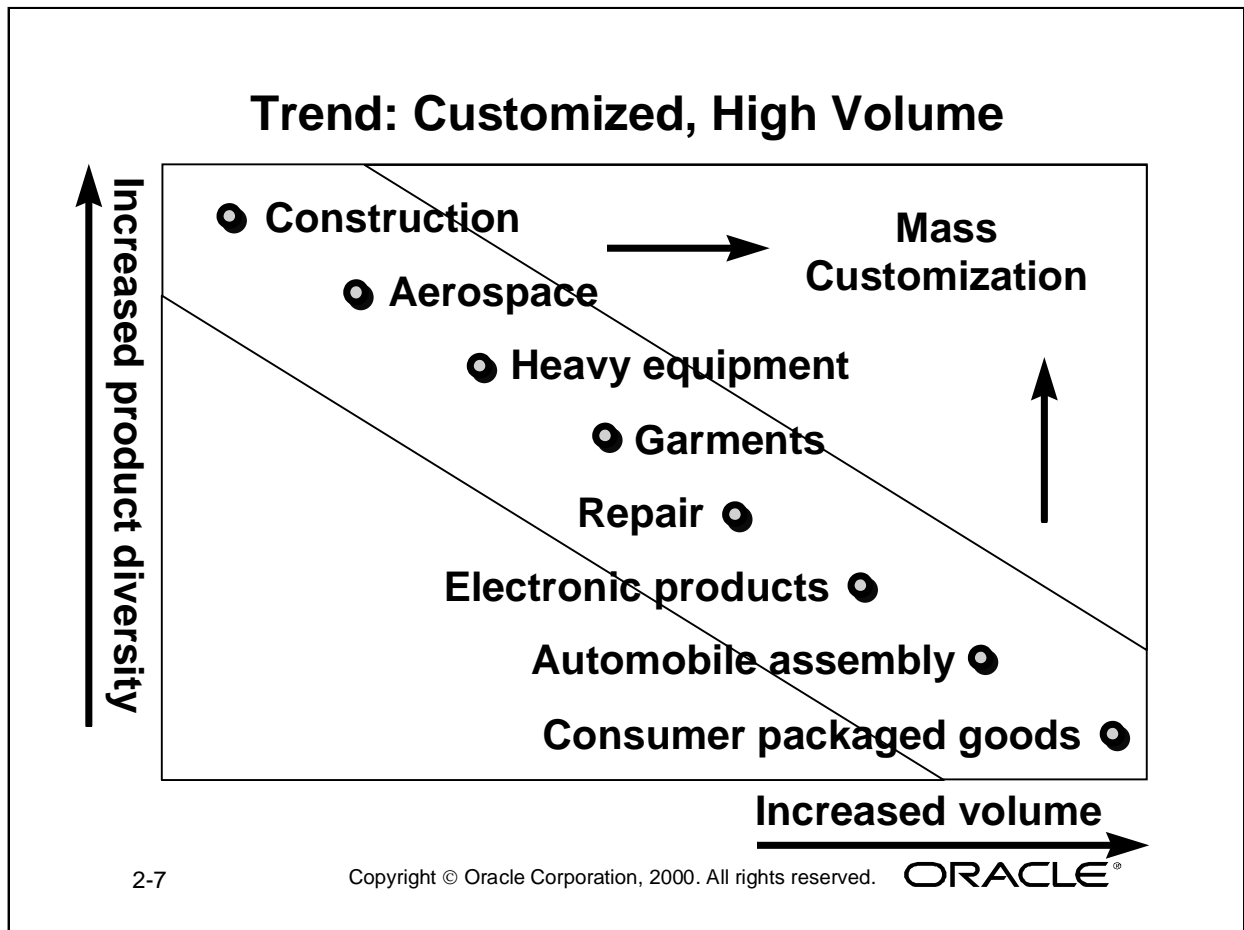
Virtual Enterprises

Virtual enterprises have several competitive advantages. In forming strategic alliances, the various participants contribute what they know best. They leverage previous research and development efforts and learn from the other partners. By consolidating knowledge workers, the virtual enterprise has an advantage in making better use of this scarce resource.

Mass Customization

Mass customization is a business environment that rapidly responds to customer demand. It provides the best features of both customized production and mass production. Customers get the custom product features they want at near the low prices and fast service typical of mass production.

Oracle Advanced Planning and Scheduling R11i 2-6



Trend Toward Mass Customization

Global markets tend to drive businesses from their current positions along the diagonal of the figure toward the competitive advantages found at the upper right. This strategy calls for making customized products in rapid response to specialized customer needs, while at the same time attaining the high quality, reliable delivery, and economies of scale typical of high-volume mass production.

Mass Customization and ASCP

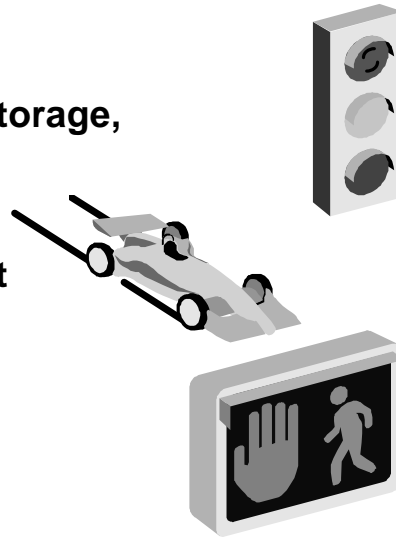
- **Mass customization**
- **Rapid response**
- **Virtual enterprises**
- **Dynamic, complex supply chains**
- **Advanced Supply Chain Planning**

Mass Customization and Advanced Supply Chain Planning

Mass customization requires rapid response to specialized customer needs. Rapid response is accomplished by forming virtual enterprises of alliance partners. Typical product life cycles are short. Therefore, the virtual enterprise partner relationships must change over time to respond to dynamic market opportunities. Dynamic alliance partner relationships increase supply chain complexity, creating a need for advanced supply chain planning to manage the system.

Why Isn't MRP Sufficient?

- **Sequential process**
- **Unconstrained production, storage, and transportation capacity**
- **Not optimized**
- **No capacity decision support**
- **Replanning is not triggered by events**



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MRP Leaves Money on the Table

Closing the loop with MRP involves sequential, time-consuming, manual processes that seek feasible, but not optimal, solutions. The material plan is generated to determine the right items, right quantities, and right timing of orders. Capacity is unconstrained. It is assumed that whatever resources are needed to purchase, transport, store, and process the material will be available as needed.

The work load associated with the material plan is checked against available capacity by rough-cut and/or capacity requirements planning programs. Whether the capacity programs are automatically launched following the MRP generation does not change the fact that it is still a sequential process. Problem areas are flagged by the capacity programs. There is no decision support for resolving capacity imbalances. Substantial experience and judgment are required to manually adjust the material plan. The material and capacity requirements programs should be rerun, because adjustments to the material plan that would relieve one bottleneck could cause another.

Time and patience usually run out long before this sequential, iterative process approaches anything close to an optimal use of resources. The focus is very narrow; the planning process rarely crosses functional, much less enterprise boundaries.

Finally, events indicating that performance is deviating from plan are at best listed in reports. They do not automatically trigger replanning.

History of Oracle APS



- **Manufacturing and supply chain planning products**
- **Third generation of memory-based planning products**
- **Release 11, simultaneous material and capacity planning and online simulation**
- **Release 11*i*, optimization and constraint-based planning**

History of Oracle's APS Solution

Oracle has been developing and delivering supply chain and manufacturing planning products since 1994. Oracle APS represents the third generation of memory-based planning products for Oracle. Memory-based planning was first introduced in release 10.7, which provided in-memory material planning that delivered an order of magnitude reduction in planning cycle times. It did this by taking advantage of improvements in computing technology and by eliminating the intensive I/O typically associated with traditional planning systems. Release 11 added simultaneous material and capacity planning and online interactive simulations. Release 11*i* adds sophisticated optimization and constraint based planning built with components supplied by ILOG S.A., of Gentilly, France.

Overall, Oracle APS is the culmination of a two-year development effort to add sophisticated constraint-based planning and optimization capabilities to an existing proven planning solution.

In addition to over five years experience in designing and developing memory-based planning products, Oracle regularly meets with the APS Customer Advisory Board to ensure that best practices and real-world issues are being addressed.

Objectives of APS Systems

- **Global visibility**
- **Rapid planning cycles**
- **Better plans**
- **Fewer plans to synchronize**
- **Rapid return on investment**

APS System Objectives

Specifically, you need systems that provide global visibility into all of the resources, such as material, machines, labor, and so on, that you need to manage, and this needs to include your trading partners' resources as well since they are a key part of your ability to respond to your customers' needs.

You need to be able to reduce the time between recognizing a market opportunity and being able to execute. Ideally, you want to be able to lock up business before your competition can realize there is an opportunity. Part of speeding things up is using technology so that less manual intervention and rework of the plan is required. This is where features like sophisticated algorithms comes in.

You also need to have fewer plans to synchronize. This includes not only your own plans, but the plans of your trading partners as well. Computing power has drastically reduced the time it takes to calculate individual plans, but there is significant time and effort expended in managing the process of integrating plans, and turning customer demand into forecasts, production plans, material plans, purchase orders, supplier production plans, and so on.

Last, and most importantly, you need to start receiving these benefits now, not months or years in the future.

Oracle Solution

Optimize the flow of material, cash, and information through the virtual enterprise

- **Global visibility**
- **Shortening planning cycle times**
- **Optimization to performance targets**
- **Collaborating with trading partners**



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Oracle's APS Solution

Oracle APS is an internally developed advanced planning and scheduling solution that enables companies to optimize, plan, and schedule their entire supply chain. It is fully integrated with the Oracle suite of enterprise applications and can also operate as a stand-alone process, integrating with competitive and legacy ERP systems. Oracle APS is backward compatible with Oracle Applications releases 10.7 and 11. It is built on Oracle's third-generation memory-based planning technology and ILOG's Optimization suite.

Oracle APS supports holistic optimization and scheduling. This enables a company to plan and schedule the entire supply chain in a single plan, regardless of manufacturing method—from highest-level supply chain planning to detailed shop floor scheduling—including both internal elements of the organization and external groups such as customers, suppliers, and outsourcing partners. This ensures that you can generate a long-term plan to meet strategic objectives, while having the short-term operational visibility needed for tactical execution.

Oracle APS also provides the flexibility to support decentralized planning environments with powerful optimization capabilities. This enables you to gain significant value up front and transition to a centralized, holistic planning model at your own pace.

Oracle APS provides integrated performance management. With this, a company can operate to plan by using a closed-loop plan-execute-measure-improve framework. Oracle APS lets you create an optimized plan, execute to the plan, measure the results with key performance indicators, automatically route notifications and alerts, and make adjustments to bring the plan back within tolerance.

Oracle Planning History

11.0 MRP and SCP	<ul style="list-style-type: none">• Memory-based planning• Simultaneous material and capacity planning• Supply chain modeling• Consolidated exceptions• Online interactive net change simulation• Supply chain available to promise
11i APS	<ul style="list-style-type: none">• Constraint-based planning• Net change planning and simulation• Optimization• Integrated performance management• Capable to promise, capable to deliver• Support for disparate systems

2-13

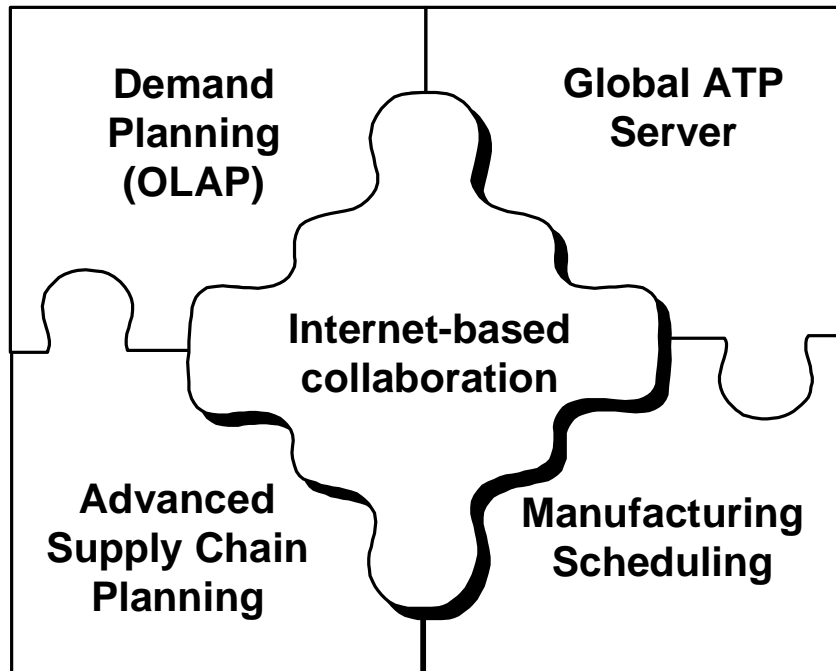
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11i APS New Features

The upper half of the figure lists features provided with Oracle release 11 Planning and Supply Chain Planning. The lower half is a summary of the additional features available with the release 11i OAPS product suite. These will be described in more detail within this course as the features and functions of each product are discussed.

Oracle APS



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Major Components of Oracle APS

The Oracle Advanced Planning System product consists of four components that can be purchased bundled, or separately:

- Oracle Advanced Supply Chain Planning (ASCP)
(Option) Constraint-Based Optimization
- Oracle Demand Planning (ODP)
- Oracle Global Available to Promise Server (Global ATP)
- Oracle Manufacturing Scheduling (Option)

Note: The Oracle Global ATP server requires installation of Oracle ASCP. At the initial release of 11i, Oracle Manufacturing Scheduling is not backward compatible with Oracle Applications releases 10.7 and 11. Oracle Manufacturing Scheduling requires installation of release 11i Oracle WIP.

Oracle APS Feature Overview

- **ASCP**
 - Holistic planning and scheduling
 - Component architecture
 - Optimization
 - Integrated performance management
 - Decision support
- **Demand Planning**
- **Global ATP Server**
- **Manufacturing Scheduling**

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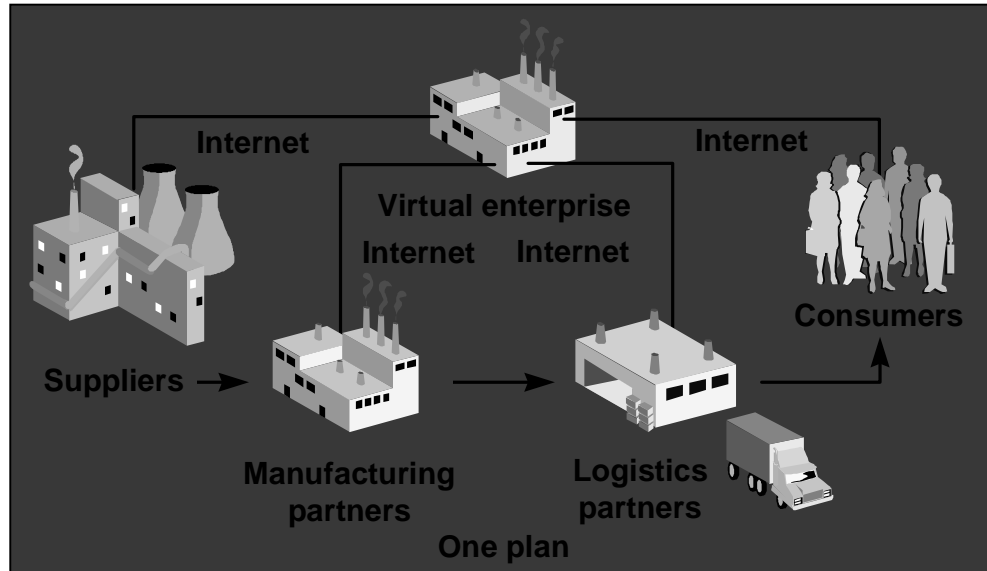
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Overview

The following section of this lesson provides a general description of the four products within the OAPS suite.

ASCP

Holistic Planning and Scheduling



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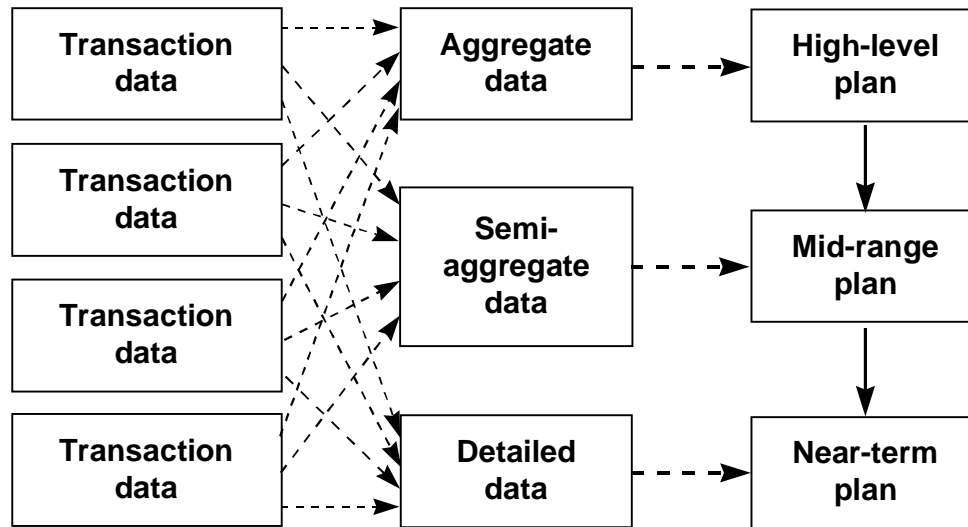
ASCP Features: Holistic Planning and Scheduling

Oracle ASCP is the only currently available software application that has the capability to plan, schedule, and optimize an entire supply chain within a single plan. The term coined to describe this key differentiator for Oracle is *holistic planning and scheduling*.

A single plan for all supply chain locations, time horizons, manufacturing methods, materials and resources is enabled by:

- A common data model for planning and execution shared to enable companies to aggregate all data at all levels
- Flexible controls to determine and tailor the granularity of the plan
- Support for mixed-mode manufacturing, enabling a company to create a single plan consolidating requirements across all aspects of the company, regardless of production method
- Integrated planning and execution to create a single closed-loop plan and to support integration with legacy systems
- Integrated performance management, enabling companies not only to create a single plan, but to use it to effectively manage their business by integrating business intelligence and workflow to create a plan-execute-measure-improve framework
- Tight integration of all pieces instead of treating them as a collection of components

Nonsynchronized Architecture



Source: AMR Research

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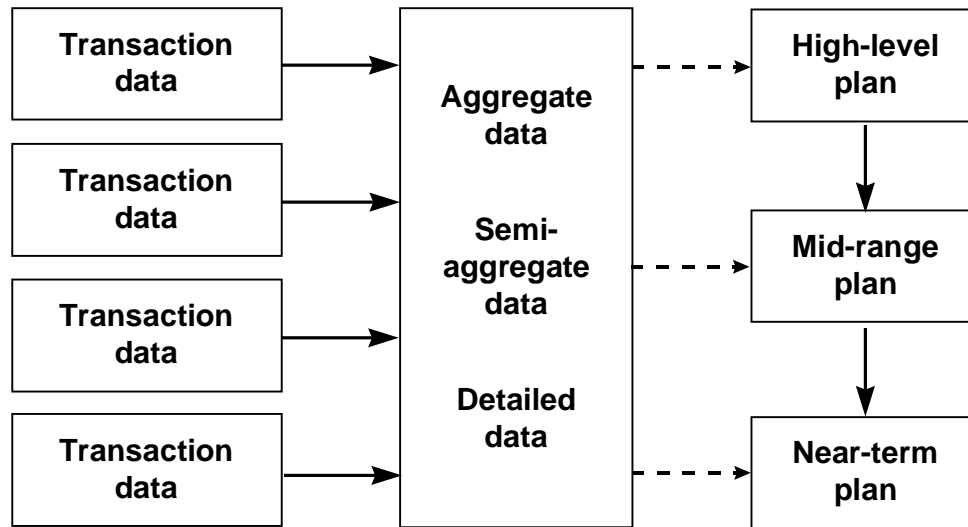
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Reconciling Multiple-Step Planning Processes

This is how some analysts describe the typical APS architecture. Typically, APS application suppliers provide multiple modules, each with its own data model. Since the APS modules rely on ERP systems for the data, multiple integration points are required. All of this needs to be managed to keep multiple plans synchronized.

Best-in-Class APS Architecture



Source: AMR Research

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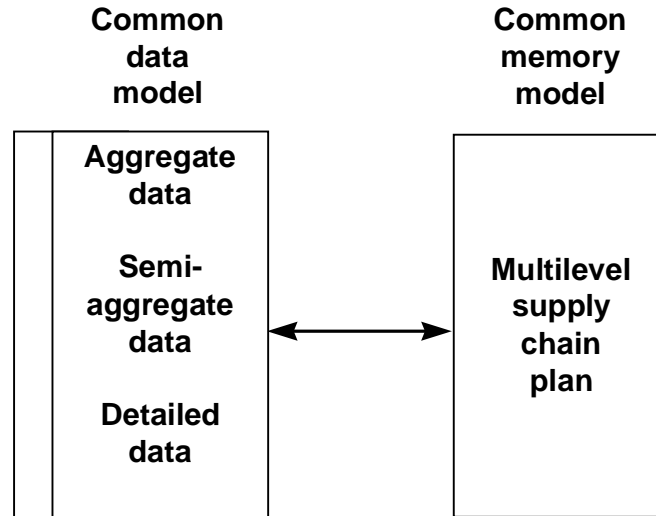
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A Better Approach

Some of the better suppliers have, or are trying to get to, a single data model for their plans. (See the figure on the next page.) They still rely on multiple integrations, and they still have multiple plans to synchronize. The market leader has announced an effort to develop a new product that will attempt to manage the communication among plans.

Common Data Model



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Oracle's Approach

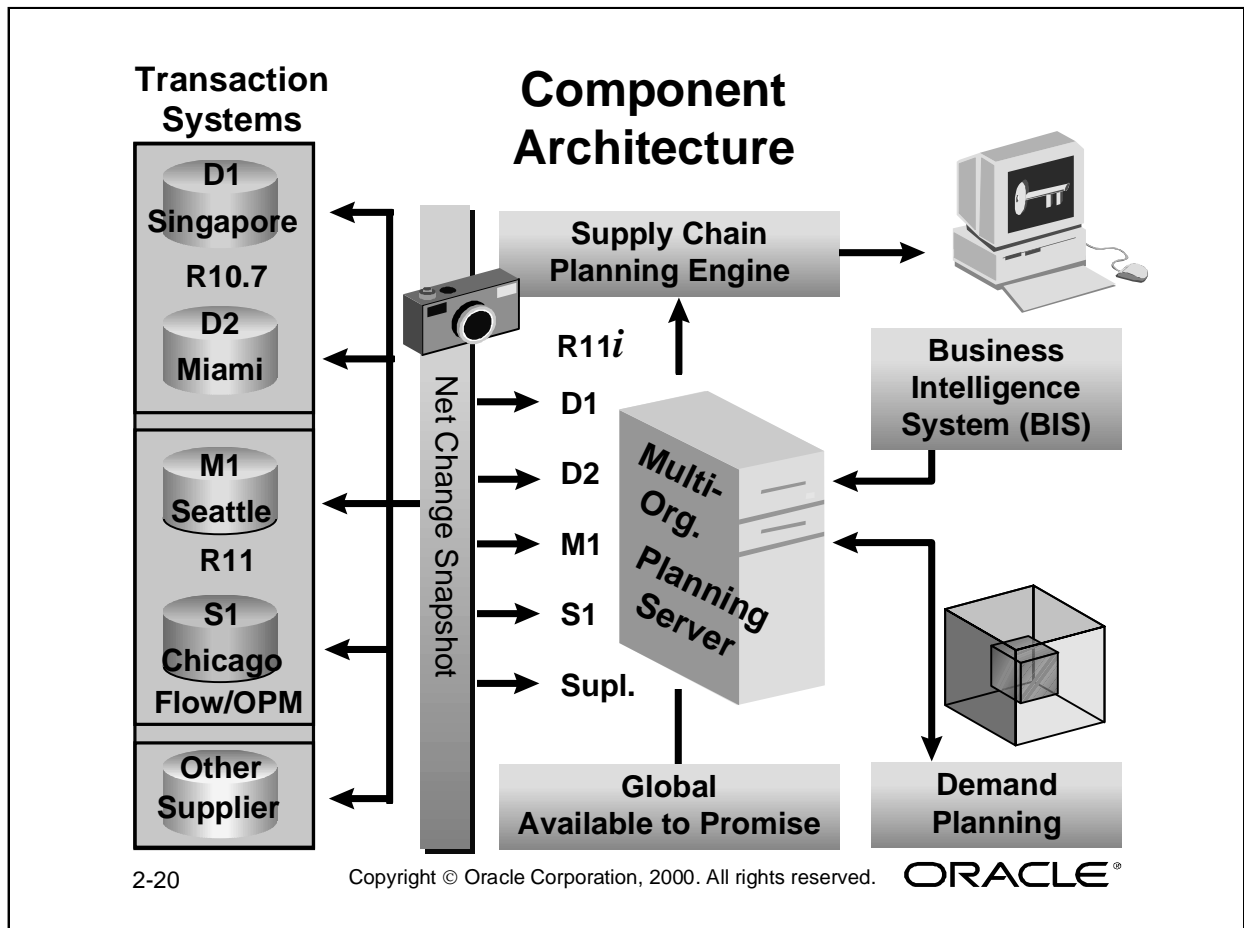
Oracle has taken a radically different approach. Oracle ASCP combines many elements of planning that have historically forced companies into multiple-step planning processes, resulting in longer planning cycles and multiple plans to reconcile. Oracle ASCP delivers faster planning cycles by combining the following capabilities into one integrated planning engine:

- Internal, customer, and supplier locations
- Distribution and manufacturing planning
- Material planning at the item or product family level
- Capacity planning at the resource or aggregate resource level
- Long-range planning and detailed scheduling
- Optimization and constraint-based scheduling

Single Common Data Model

Oracle provides a single common data model and a single memory model or planning process.

Oracle Advanced Supply Chain Planning and Oracle Applications share a common data model for planning and execution; and since high-level planning and detailed scheduling are the same process, there is only one data model. Even best-in-class APS products today with a common data model for planning must still reconcile that data model with execution systems.



ASCP Features: Component Architecture

Multi-Organization Planning Server

Implementation of the advanced planning system does not disrupt the existing transaction instances (also called source instances) shown on the left. Data collection programs capture a snapshot of the data from the transaction instances, and copy that information to the ASCP system (also called the destination system), which can be installed on a separate planning server. The supply chain planning engine can then perform multi-organization planning and simulation calculations without impacting transaction server resources. Results of the supply chain optimization, such as planned orders, are published back to the transaction systems. Execution status is refreshed upon the next data collection.

The demand planning, the Global ATP server, and the Business Intelligence System (BIS) performance measurement system interface with the planning server.

No Additional Supply Chain Setup Required

Oracle Applications customers never see more than one model of bills, routings, items, bills of distribution, sourcing rules, and so on with Oracle Advanced Supply Chain Planning. The same sourcing rules that automatically choose supply sources in Oracle Purchasing and ATP are automatically used by Oracle Advanced Supply Chain Planning to define the supply chain sourcing relationships. This drastically reduces the time needed to implement the APS solution, leading to much faster return on investment. It also reduces the ongoing maintenance costs by eliminating redundant data entry and eliminating the headaches of keeping multiple representations of your business data synchronized. This provides you a lower total cost of ownership and higher returns on your investment in the long term as well.

Optimization

- **ILOG solver and optimization technology**
- **Optimizes plans to strategic objectives**
- **Incorporated with third-generation memory-based planning**
- **Optimal sourcing decisions, production, and distribution plans for each organization**

ASCP Features: Optimization

Oracle APS and ILOG

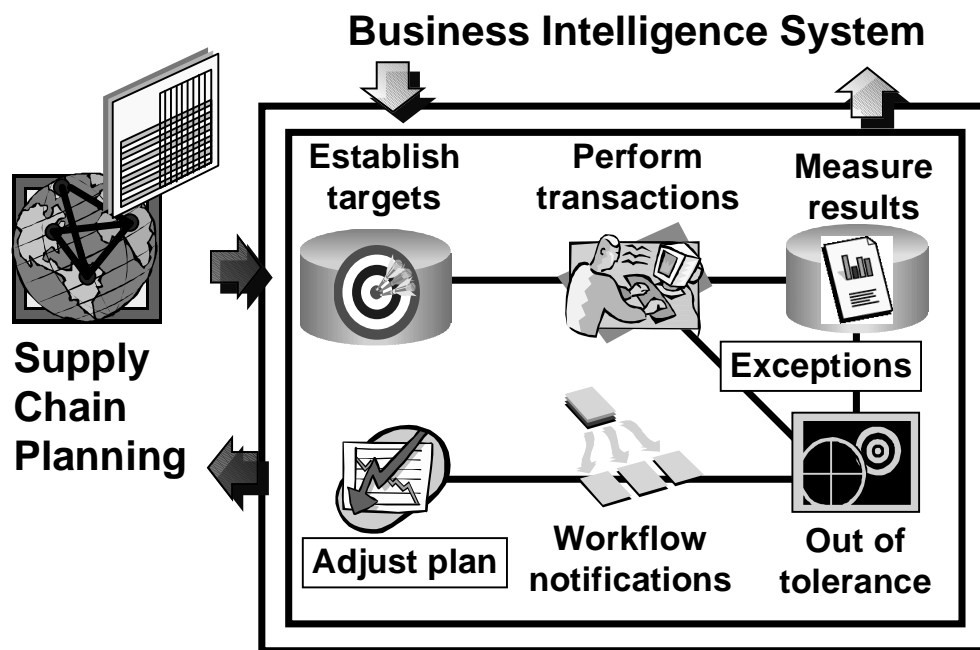
The Oracle Advanced Planning System employs advanced solver and optimization techniques built with components supplied by ILOG S.A., of Gentilly, France.

You can optimize your plans to financial and other enterprise-strategic objectives. The memory-based planner creates coordinated production and distribution plans for each organization. In addition, a constraint-based scheduling engine ensures that the plan is feasible and respects all of your constraints.

Business Requirements Fulfilled

- Simultaneously plan material and capacity while considering the constraints of each.
- Create plans that achieve selected goals:
 - Minimize inventory costs
 - Maximize on-time delivery
 - Maximize overall plan profit

Integrated Performance Management



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ASCP Features: Integrated Performance Management

Integrated performance management is the link between a plan and its affect on the enterprise. A plan can be directly evaluated based on defined key performance indicators (KPIs).

Oracle APS integrates with Oracle Business Intelligence System and Oracle Workflow to create a plan-execute-measure-improve continuous cycle.

Business Requirements Fulfilled

- Easily and quickly evaluate a plan based on its impact on target KPIs.
- Manage by exception; receive notifications when corrective actions are required.
- Set organizational objectives to drive continuous improvement.
- Optimize to performance targets:
 - Industry standards
 - Corporate
 - Personal

Features

- Integration with Oracle BIS Performance Management System:
 - Multiplan KPI comparisons
 - Multiplan exception comparisons
- Integration with Oracle Workflow
- Notification and corrective action alerts

Decision Support

- **Planner workbench decision-support tool**
- **Flexible, intuitive, and easy to use**
- **Quick access to information**
- **Streamlines common activities of planners**



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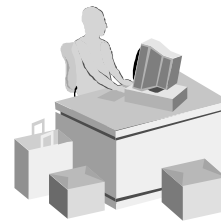
ASCP Features: Decision Support

Business Requirements Fulfilled

- Increase system efficiency.
- Improve user productivity.
- Improve Planner Workbench performance.
- Improve ability to customize display and extend functionality.
- Use fewer keystrokes for common actions.
- Achieve higher customer satisfaction.
- Achieve lower cost to the organization.

Oracle Demand Planning (ODP)

- **Compare constrained production plan with unconstrained demand forecast**
- **Multiple forecasting techniques**
- **What-if scenarios**
- **Benchmark performance**



What Is Oracle Demand Planning?

Oracle Demand Planning (ODP) is based on a multidimensional online analytical processing (OLAP) engine, which supports a broad range of analytical features. Oracle Demand Planning enables companies to create forecasts of future demand that are not constrained by limited production resource capacity. ODP writes the forecast into the planning server, and from there it can be tested against the constraints of manufacturing by ASCP. Constrained manufacturing production plans, which are generated by Oracle Advanced Supply Chain Planning, are then made available for comparison with the unconstrained demand forecast within Oracle Demand Planning. This comparison reveals the value of lost business caused by production constraints.

ODP provides a rich set of forecasting techniques that can be used either selectively or in an automated expert mode. The techniques take into account seasonality, outliers, and missing data. The system supports ad-hoc creation of an unlimited number of scenarios, which in turn can be analyzed. The analysis provided across scenarios can be along any dimension and at any level. When looking at volume data, you can select the units of measure with which to plan, and when looking at volume in terms of value, you can select the currency in which to present the data.

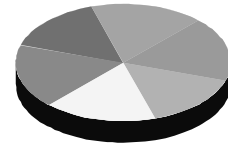
Forecasting can be done at any level of detail within user-defined hierarchies. Forecasts can be generated from the top down, bottom up, or middle out. Adjustments to forecasts are tracked. History can be reviewed to understand how the results were generated.

The system can be used to benchmark performance. The OLAP engine contained in the system supports a broad range of metrics to compare actual sales to forecast, as well as to study further the trends within actual sales data.

ODP Benefits



- **Improve forecast accuracy**
- **Improve supply and demand alignment**
 - **Inventory reduction**
 - **Higher fill rates, higher revenue**
- **Automate forecast consolidation and reconciliation**
- **Plan collaboratively with customers**



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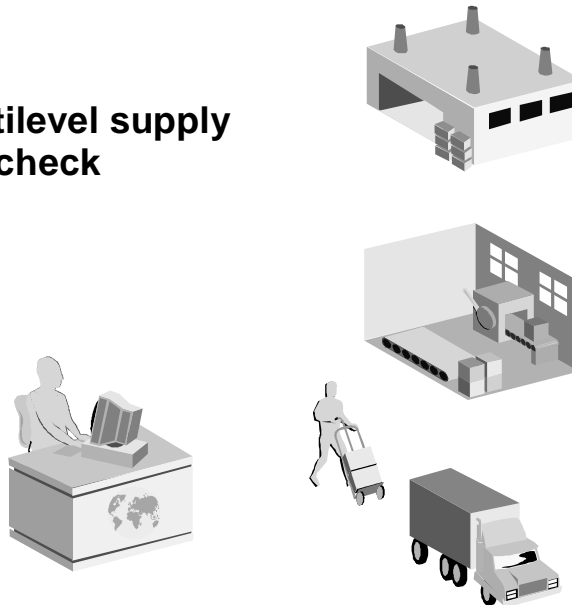
Oracle Demand Planning Benefits

Demand forecasting is a crucial function for managing the manufacturing process. It provides the information necessary to improve the operational plans, as well as to improve the company's ability to manage its profitability and its customers' expectations.

Oracle Demand Planning improves the planning process by providing the information necessary to make the product-mix decisions in a manner consistent with the goals of the company. The ODP system enables manufacturers to systematically create the best forecasts by using the best available information.

Global ATP Server

- **ATP/CTP/CTD**
- **Configurable multilevel supply chain availability check**



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What Is the Global Available-to-Promise Server?

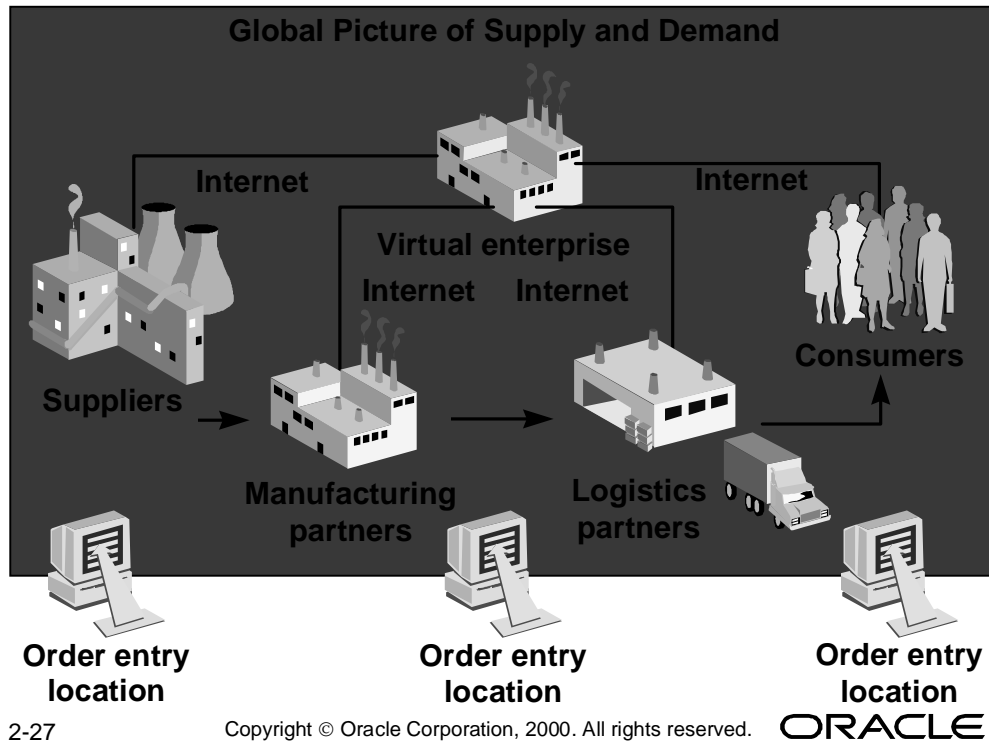
Fast, accurate order promising is the key to retaining existing customers and attracting new customers. Oracle's Advanced Planning System allows you to quickly make accurate delivery promises that your customers can rely on.

As order promising methodology has evolved, new terms have been coined to describe advanced order promising capabilities. Available-to-promise (ATP) typically refers to the ability to promise finished goods availability based on a statement of current and planned material supply. Capable-to-promise (CTP) refers to the additional ability to consider component material and production resources while making promises to meet demand. Capable-to-deliver (CTD) refers to extending order promising to consider transportation resources and transit time necessary to meet customers' requests.

The Oracle Global Available-to-Promise (Global ATP) Server enables companies to quickly perform accurate available-to-promise, capable-to-promise, and capable-to-deliver calculations based on any link in their supply chain, including trading partners and suppliers.

The order promising solution is flexible and configurable. You can control the list of potential sources to be considered in the availability check. You can also control the number of levels in your supply chain bill to be considered in your check. At each level in the supply chain bill, you can specify the key components and bottleneck resources for which you want to check availability. You can also check the group availability of products that need to ship together, like ship sets and arrival sets.

Oracle Global ATP Server Features



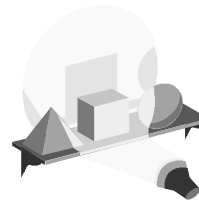
Global ATP Features

Oracle Global ATP provides multilevel global order promising. Capable-to-promise (CTP) uses flexible rules that determine whether to consider supplier capacity. Capable-to-Deliver (CTD) uses transportation lead time and capacity information. Global ATP provides:

- Seamless integration with Oracle Order Entry
- Flexible ATP rules: Assign sources for availability calculations down to the customer and item levels
- Supply chain ATP, CTP, and CTD:
 - Commit against material and resource capacity, even if unplanned
 - Commit against supplier capacity
 - Commit using transportation lead time
- Global ATP server:
 - Consolidated supply and demand
 - Access from multiple order-entry systems
 - For fast response, ATP server reduces contention with transaction systems and planning server
- Multilevel BOM availability checking
- Check availability of end items and their components

Oracle Global ATP Server Benefits

- **Fast, accurate commitments**
- **Global picture of supply and demand**
- **Capture additional sales**



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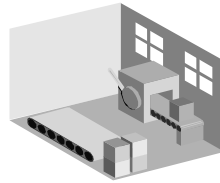
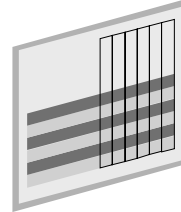
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Global ATP Benefits

- Fast, accurate commitments to customer orders
- Commit to demand based on global supply and demand picture
- Capture additional revenue by committing to unplanned demand based on material and resource capacity

Manufacturing Scheduling

- **Short-term finite scheduling and rescheduling**
- **Interactive scheduling for material, labor, and equipment**
- **Drag-and-drop user interface (UI)**
- **Shop floor visibility**



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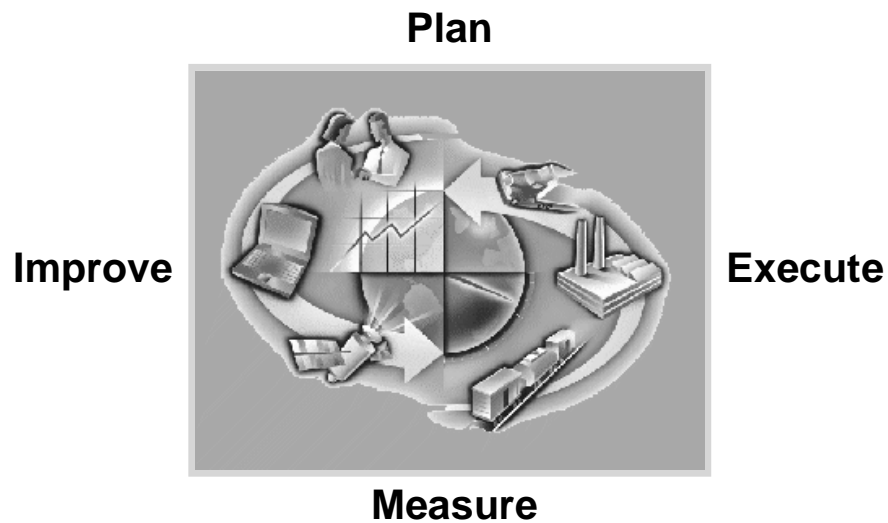
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What Is Oracle Manufacturing Scheduling?

Oracle Manufacturing Scheduling enables companies to generate a feasible shop floor schedule constrained by material and resource availability within a production facility. It generates minute-level schedules for all of your plant's resources, including material, labor, and equipment. It includes a compelling user interface with strong drag-and-drop and interactive scheduling capabilities and tight integration with Oracle Work in Process. You can use the Scheduling Workbench user interface to view and interactively reschedule jobs, operations, and resources.

Note: Oracle Manufacturing Scheduling is the only APS module that requires implementation of release 11i on the transaction (source) instance. At the time of the initial 11i release, Oracle Manufacturing Scheduling will not be compatible with earlier releases.

Integrated APS Planning Cycle



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Planning Cycle

Oracle APS integrates with Oracle Business Intelligence System (BIS) and Oracle Workflow to create a plan-execute-measure-improve continuous cycle.

Setup: APS—Transaction Systems



Order Entry

Customers
Price lists

Purchasing

Supplier list
Supplier capacity

Supply Chain

Sourcing rules
Bills of distribution
Assignment sets

Inventory

Organizations
Items
Item attributes

Engineering

BOMs
Departments
Resources
Routings and standards

Cost

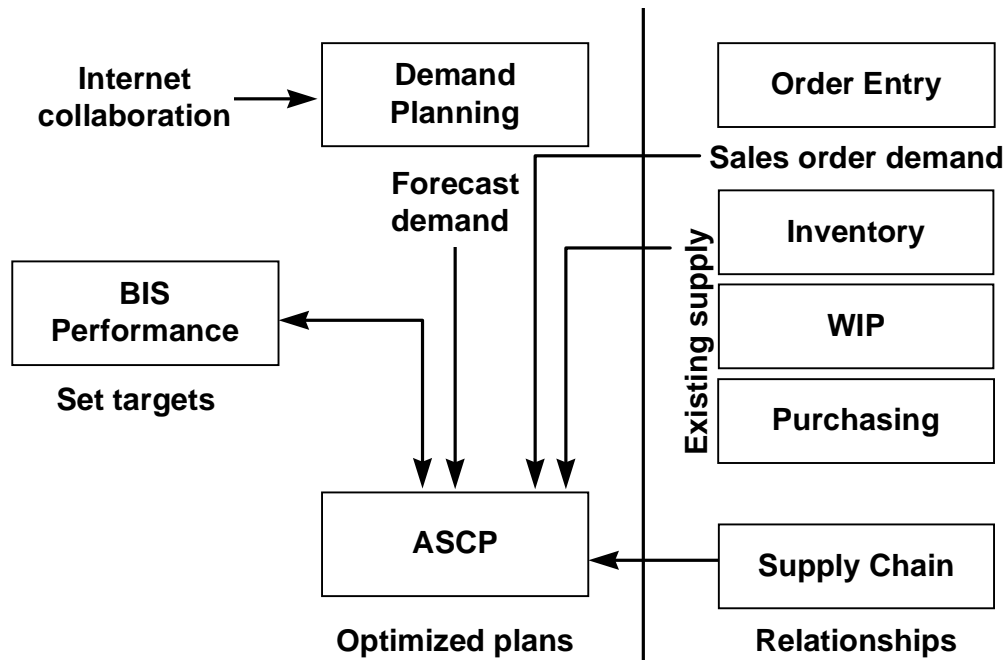
2-31

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No Redundant Setup

The APS system uses transaction system (also called source system) information already set up in existing release 10.7 or later implementations.

Plan: APS—Transaction



2-32

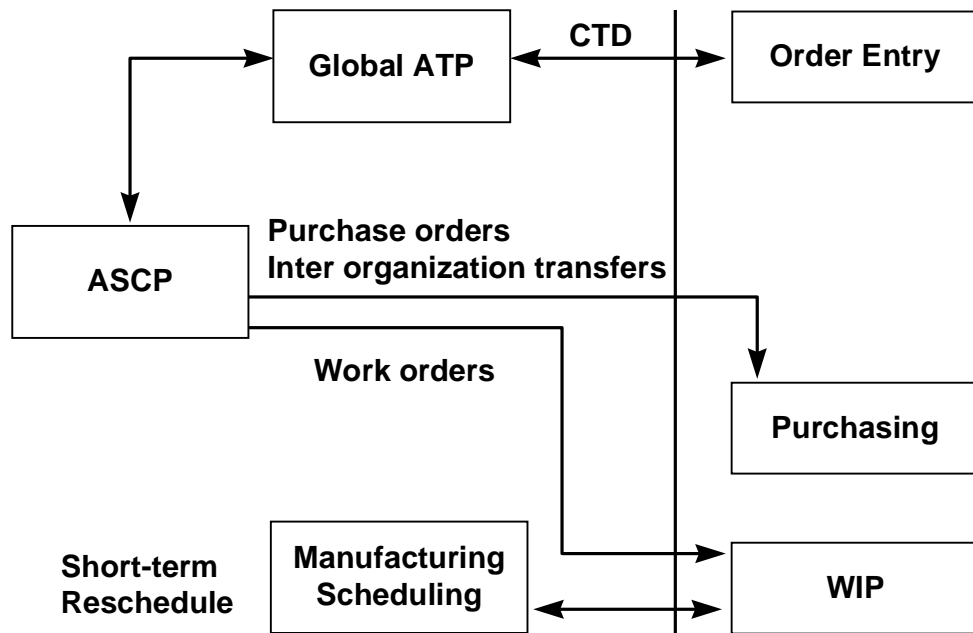
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Planning Demand and Supply

To begin the planning cycle, Internet-based collaboration is used to collect demand information from supply chain partners and internal sources. The demand planning process results in a demand forecast entered into the Advanced Supply Chain Planning engine. Collection programs obtain other input for planning, such as sales orders; finished goods inventory (FGI); work-in-process (WIP); and raw material on-hand inventory, released purchase orders, and supply chain sourcing information. ASCP then creates plans optimized to objectives such as inventory turnover, profit, on-time delivery, and resource utilization that are consistent with the key business performance indicator targets you have established.

Execute: APS—Transaction



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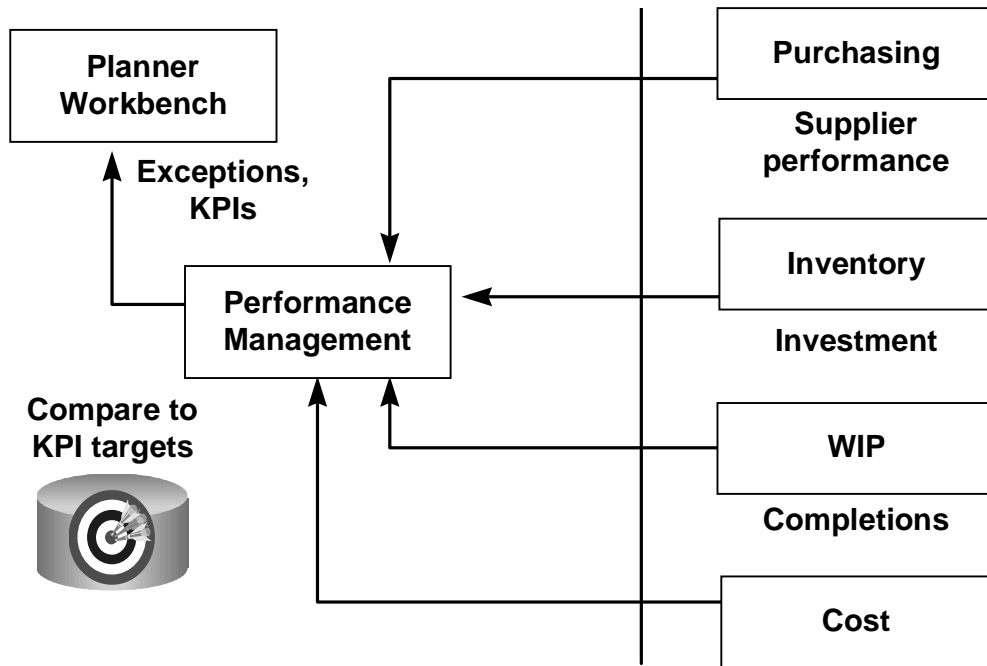
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Executing Plans

ASCP creates an optimized sourcing plan consisting of suggested work orders and purchase orders. The supply chain sourcing plan forms the basis for Global ATP sales order promising.

Shop floor job, operation, and resource rescheduling decisions are implemented in the APS Manufacturing Scheduling module and automatically integrated to the Work-In-Process module. These changes to the WIP supply information are collected during the next planning cycle.

Measure: APS—Transaction



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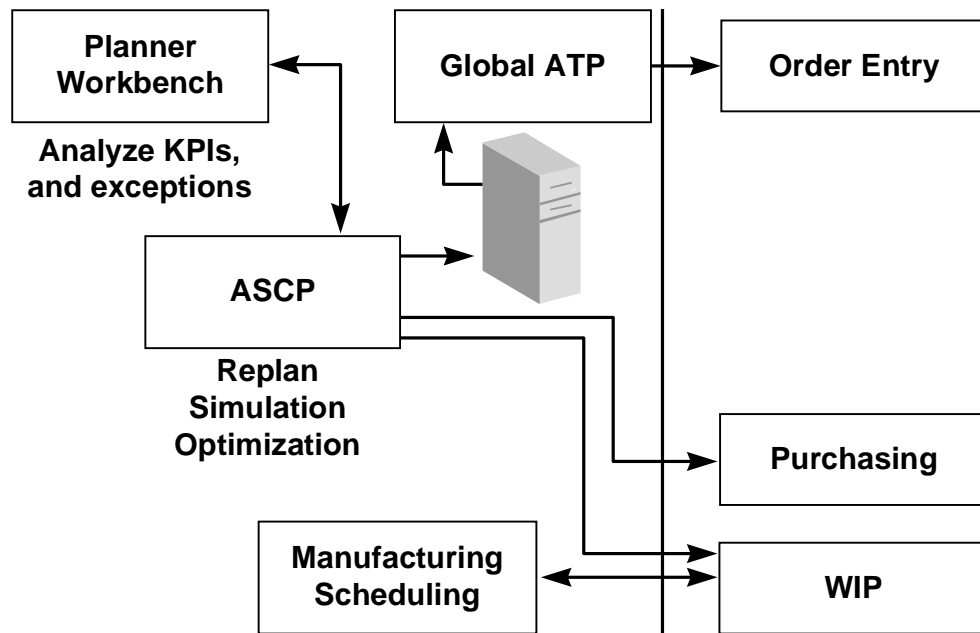
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Measuring Performance

Integrated performance management compares measured performance to key indicator targets. When the difference exceeds user-defined tolerances, Oracle Workflow is used to send notifications that corrective actions are required.

Supplier performance and WIP completions are a measures of on-time delivery and resource utilization. Inventory investment is reflected in inventory turnover ratio. Cost is an important component of profit margin.

Improve: APS—Transaction



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Taking Corrective Action

The Planner Workbench user interface provides graphical comparisons of exceptions and key performance indicators associated with alternative plans.

Key performance indicators:

- Inventory turns
- On-time delivery
- Margin percentage
- Utilization

The Planner Workbench also provides the ability to view exception message details and to quickly simulate alternative plans.

The planning control loop is closed with replanning, which updates order suggestions and Global ATP promise information based on execution performance.

APS Benefits: Component Architecture

- **Rapid implementation**
- **Faster time to benefit**
- **Planning on demand**
- **Distributed planning**



Component Architecture

- **Go live today:** Interface with existing ERP systems for quick implementation. Using Oracle Applications One Hour Install to install the software, Oracle Applications Implementation Wizard to guide you through the applications setup, and the included collection programs to gather the data from your applications instances, implementation time for Oracle APS can be measured in hours or days instead of weeks or months.
- **Faster time to benefit:** Component architecture enables you to upgrade your planning modules before upgrading the rest of your Oracle Applications. Oracle APS will work with prior versions of Oracle Applications. The short implementation schedule will enable you to begin realizing benefits rapidly. Savings can be used to fund the rest of your implementation project.
- **Planning on demand:** Planners need online interactive net change simulation to respond to dynamic conditions. Deploying your planning applications on a separate server enables you to run planning processes and perform simulations without affecting the performance of your transaction processing. You can perform simulations as required to be responsive to your customers' needs.
- **Distributed planning:** Oracle APS enables you to perform global distributed planning. The planning server can consolidate the data from multiple transactions systems, plan your entire global supply chain, and publish the results back to your transaction systems. In addition, APIs are provided to support legacy system integration. You can choose the way you deploy Oracle APS to support either centralized or decentralized planning strategies.

APS Benefits: Integrated Performance Management

- **Optimize to performance targets**
 - Industry standards
 - Corporate
 - Personal
- **Evaluate plans based on targets**
- **Define corrective actions**
- **Initiate actions as needed**



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Integration with Performance Management System

The planning system is integrated with the Oracle Business Intelligence System (OBIS). In OBIS, you can set targets to drive improvement in your key performance measures. Oracle Advanced Supply Chain Planning will optimize your plans to help you achieve your targets. Alternative plans can be evaluated based on their impact on your key performance measures. Multiple simulations can be compared to help you choose the tactical and operations plans that best meet your strategic objectives.

Closing the Loop

As you execute the plan, your actual performance is monitored against your targets. As exceptions arise, notifications or corrective action requests can automatically be sent to the responsible parties.

APS Benefits

- **Collaborative supply chain planning**
- **Intuitive graphical user interface (GUI)**



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Collaborative Supply Chain Planning

Oracle ASCP extends the collaborative features of Oracle Applications. It is built on Oracle's Internet computing architecture, which enables all of the applications to be deployed over the Internet or your corporate intranet. It is also integrated with Oracle's Self-Service Web Applications. It provides powerful Internet-based collaboration capabilities that enable you to seamlessly communicate with your trading partners.

Intuitive Graphical User Interface

Oracle ASCP introduces a completely redesigned version of the Planner Workbench. Extensive discussions and design reviews with customers have led to many changes to make the Planner Workbench more flexible, more intuitive, and easier to use. Some of the highlights of the new user interface include:

- Plan performance indicators
- Flexible tree navigation
- Customizable data display
- User-definable graphics
- Graphical supply chain display
- Full graphical pegging display
- Ability to zoom to related information
- Pivot tables

Summary

In this lesson, you should have learned how to:

- **Describe the elements and functions of Oracle Advanced Planning and Scheduling (OAPS)**
- **Sketch the architecture of OAPS**
- **Explain how OAPS interacts with other application modules**
- **Describe the benefits of OAPS features**

Features Summary

- Component architecture
- Advanced mixed-mode manufacturing planning
- Integrated performance management
- Advanced simulation and net change planning
- Global order promising
- Collaborative supply chain planning
- Intuitive Planner Workbench graphical user interface (GUI)

Rapidly Begin ROI

It is expected that Oracle release 10.7 and release 11 customers will be able to implement the Oracle APS solution in approximately one day, offering customers the opportunity to improve profitability, increase efficiencies, and improve responsiveness almost immediately.

Mixed-Mode Manufacturing Support

Oracle's APS solution is compatible with many manufacturing environments, including project, discrete, flow, and process manufacturing, or any combination of these.

Internet Collaboration

Oracle APS enables supply chain partners to participate in a collaborative planning process to increase customer service and lower costs—promising orders based on supplier resources and capacity as well as sharing demand forecast and production schedule information using the Internet.

Practice 2-1 Overview

This practice is a quiz covering the APS Overview.

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Performing Practice 2-1

For detailed instructions on performing this practice, see Practice 2-1 in Appendix A, “Practices and Solutions.”

3

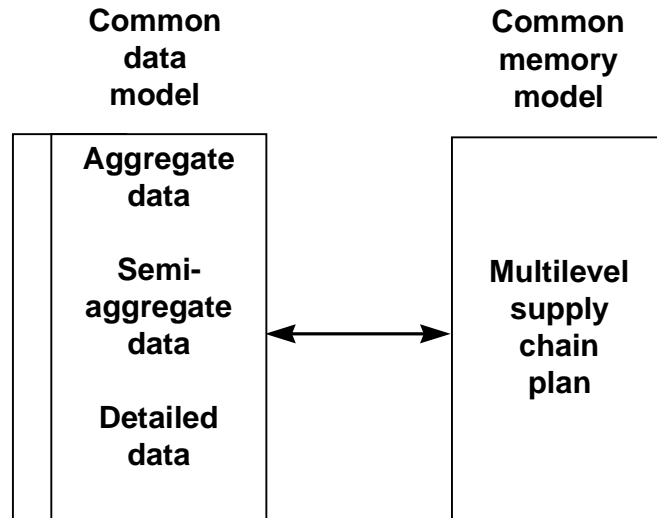
Transaction System Setup

Objectives

After completing this lesson, you should be able to do the following:

- **Identify data setup in transactional modules that is collected into APS**
- **Set up the transaction system to enable ASCP functionality**
- **Discuss the use of flexfields to accommodate APS-specific data**

Oracle's Common Data Model Architecture



3-3

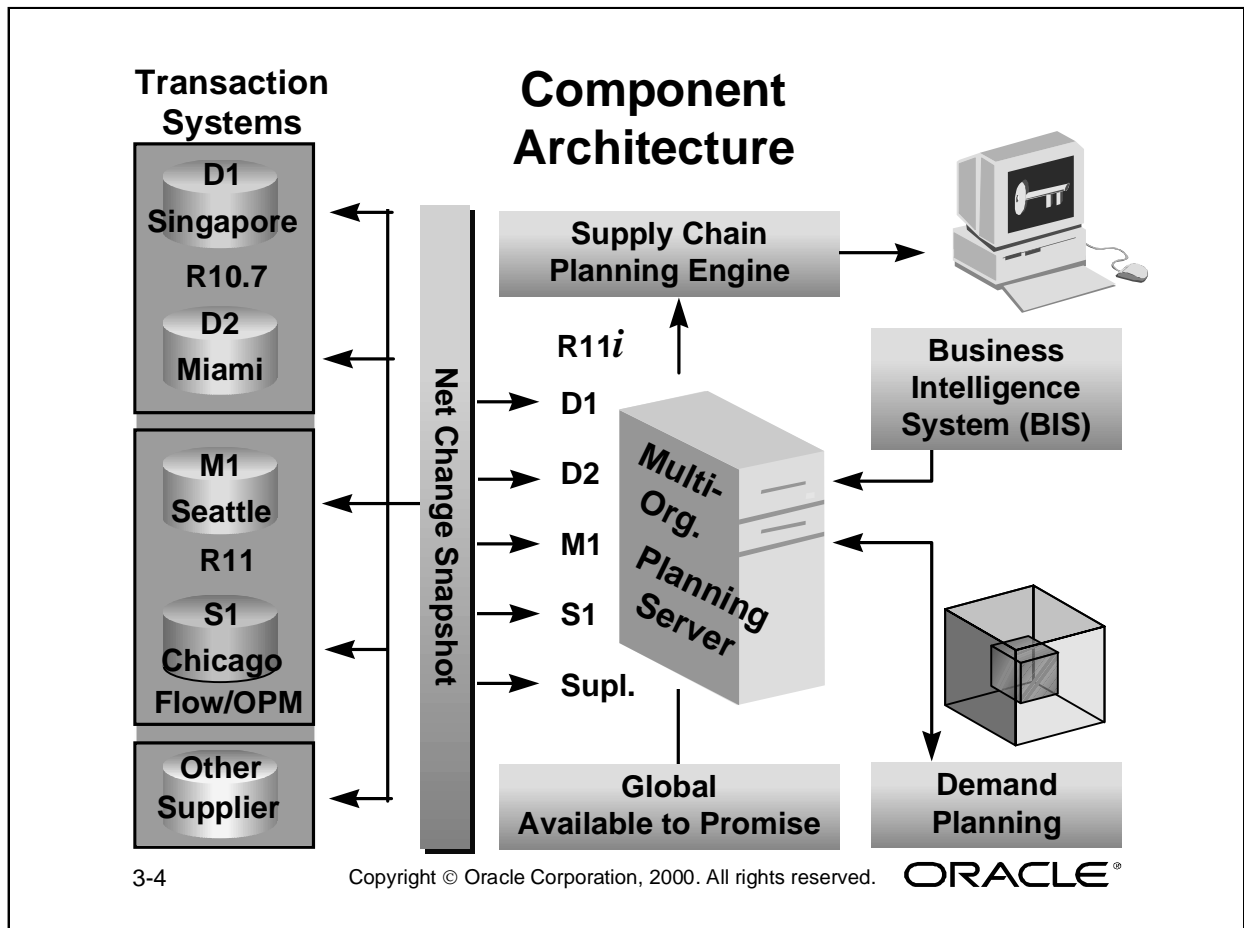
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Common Data Model

Oracle Advanced Supply Chain Planning and Oracle Applications share a common data model for planning and execution, while high-level planning and detailed scheduling are accomplished within a common in-memory process. Therefore, Oracle Applications customers never see more than one model of bills, routings, items, bills of distribution, sourcing rules, and so on. The same sourcing rules that automatically choose supply sources in Oracle Purchasing and ATP are automatically reused by Oracle Advanced Supply Chain Planning to define the supply chain sourcing relationships. No additional setup is required.

This drastically reduces the time needed to implement the APS solution, leading to much faster return on investment. It also reduces ongoing maintenance costs by eliminating redundant data entry. Gone are the headaches of keeping multiple representations of your business data synchronized. There is only one representation. The common data model and single planning process result in lower total cost of ownership and higher returns on your investment.

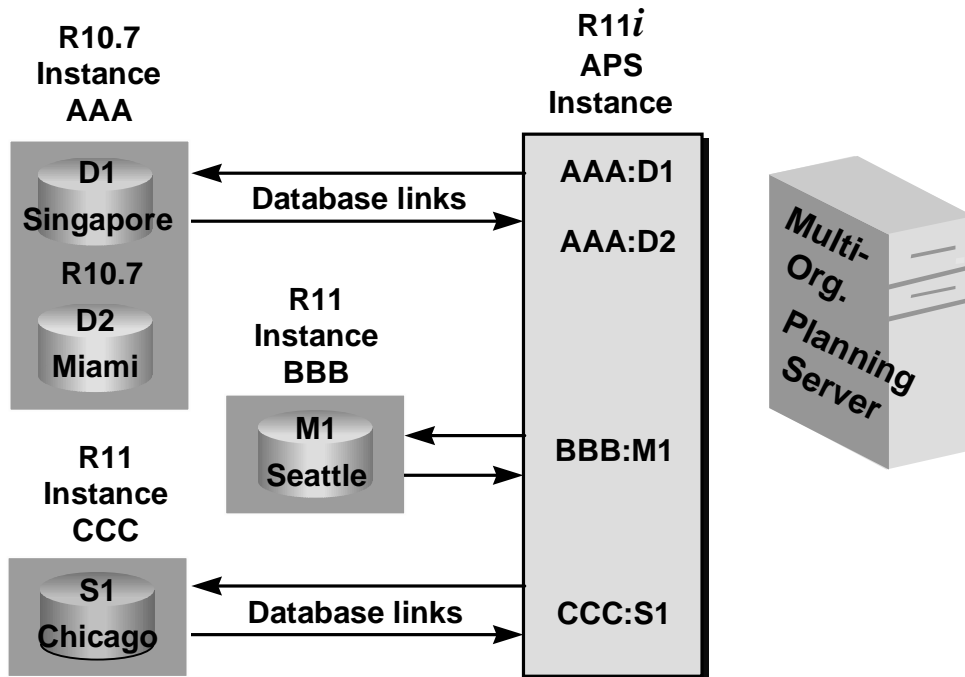


Multi-Organization Planning Server

Implementation of the Advanced Planning System need not disrupt the existing transaction system operations. The figure shows a separate planning server capturing a snapshot of the data from the transaction systems. The user can specify the frequency of data collection program execution and also control the type of data that is collected at different intervals. (Refer to the lesson titled “Transaction System Data Collection.”) The supply chain planning engine performs multi-organization planning and simulation calculations without affecting transaction server resources. Results of supply chain optimization, such as a set of firm planned orders and purchase requisitions, are published back to the transaction systems. In most cases, the work load on the existing transaction system servers will be reduced, since the time-consuming manufacturing planning calculations will no longer be run on the transaction system servers.

Oracle Demand Planning, Global ATP server, and Business Intelligence System interface with the planning server. Those systems do not contend with the transaction system resources, and if installed on still other servers, need not contend with the ASCP calculation resources.

Instance Name: Organization Code



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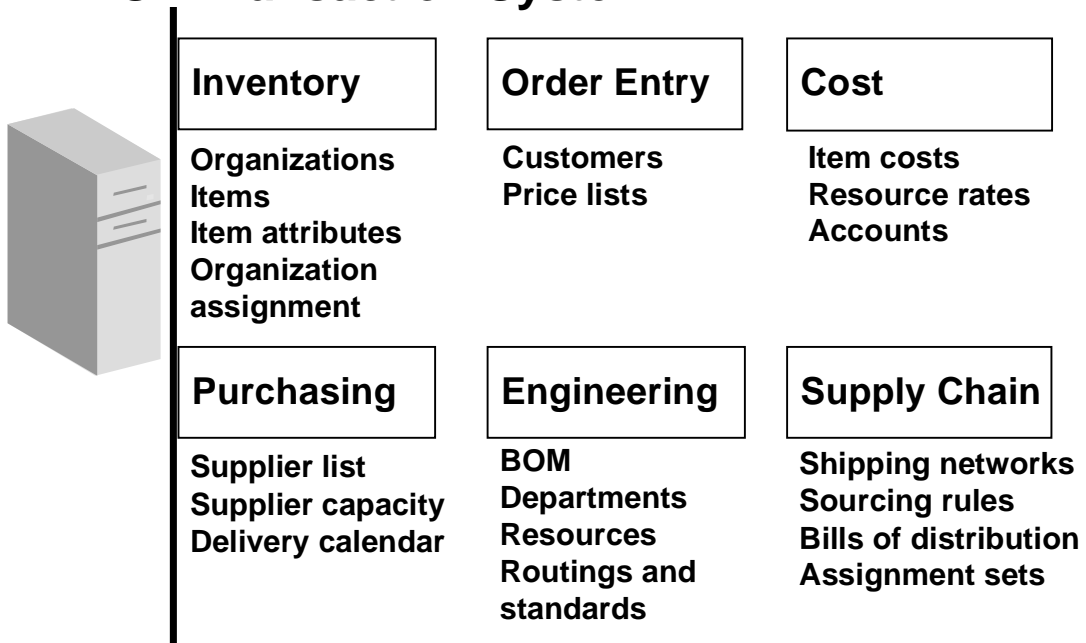
APS Organization Code Instance Tag

You can collect from multiple instances and prior releases for use by release 11i APS. The organization codes defined on the APS side include reference to the source instance name. In the figure, the transaction system for the distribution centers D1 and D2 are shown to be operating on a release 10.7 instance named AAA. Using a database link, the data collection program obtains information about organization D1 from the 10.7 release, and then brings that information to the release 11i planning server organization AAA:D1. Another database link is used when ASCP plan information for organization AAA:D1 is published back to the transaction system organization D1 on instance AAA.

(Refer to the lesson titled “Transaction System Data Collection.”)

The key is that nothing need be changed regarding the inventory organization structure or organization codes on the source instances.

Setup: APS—Transaction System



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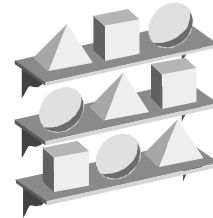
No Redundant Setup

The APS system uses transaction system information already set up in existing release 10.7 or later implementations. This lesson highlights transaction system setup in each of the following modules that is particularly important to the APS system:

- Inventory
- Order Entry/Order Management
- Cost
- Engineering
- Purchasing
- Supply Chain Planning

Inventory Setup

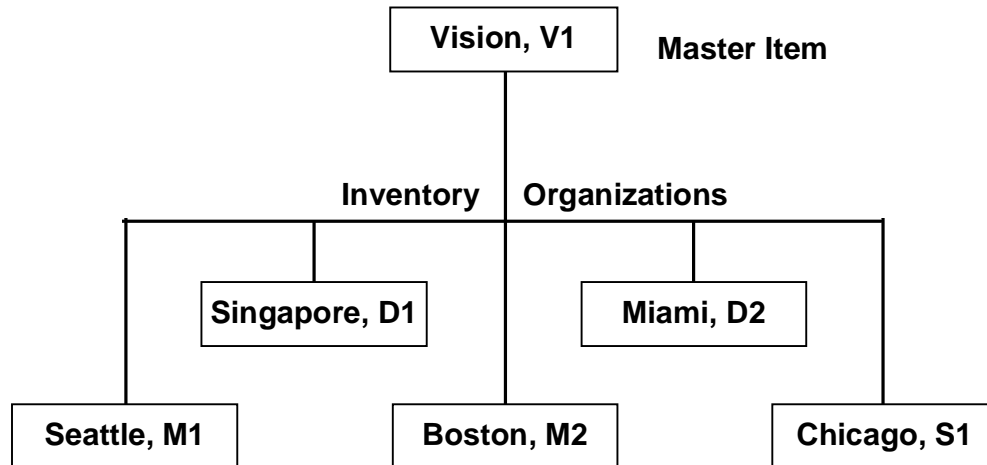
- **Define inventory organization structure and organization capacity**
- **Create item master records**
- **Specify item attributes**
- **Assign items to organizations**



Inventory

Inventory setup includes setting up the item master and inventory organization relationship, creating item master records, specifying item attributes, and assigning items to inventory organizations.

Inventory Organization Structure



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Inventory Organization Structure

The inventory organization structure is an important prerequisite to specifying item attribute information. Inventory items are defined in the item master and then enabled in one or more inventory organizations. For inventory organizations to become valid LOV choices in the Organization Assignment window, the relationship between each inventory organization and its item master organization must have previously been defined on the Inventory Parameters tabbed region of the Organization Parameters window.

Organization Parameters

Organization Parameters (M1)

Inventory Parameters | Costing Information | Revision, Lot, Serial | ATP, Pick, Item-Sourcing

Organization Code: M1

Item Master Organization: Vision Operations

Calendar: Vision01

Demand Class: DCLASSA

Move Order Timeout Period: 0 Days

Move Order Timeout Action: Approve automatically

Locator Control: Determined at Subinventory level...

☒ Allow Negative Balances

Capacity

Load Weight: [] UOM: []

Volume: [] UOM: []

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Organization Parameters

(N) Inventory—>Setup—>Organization—>Parameters

Item Master Organization

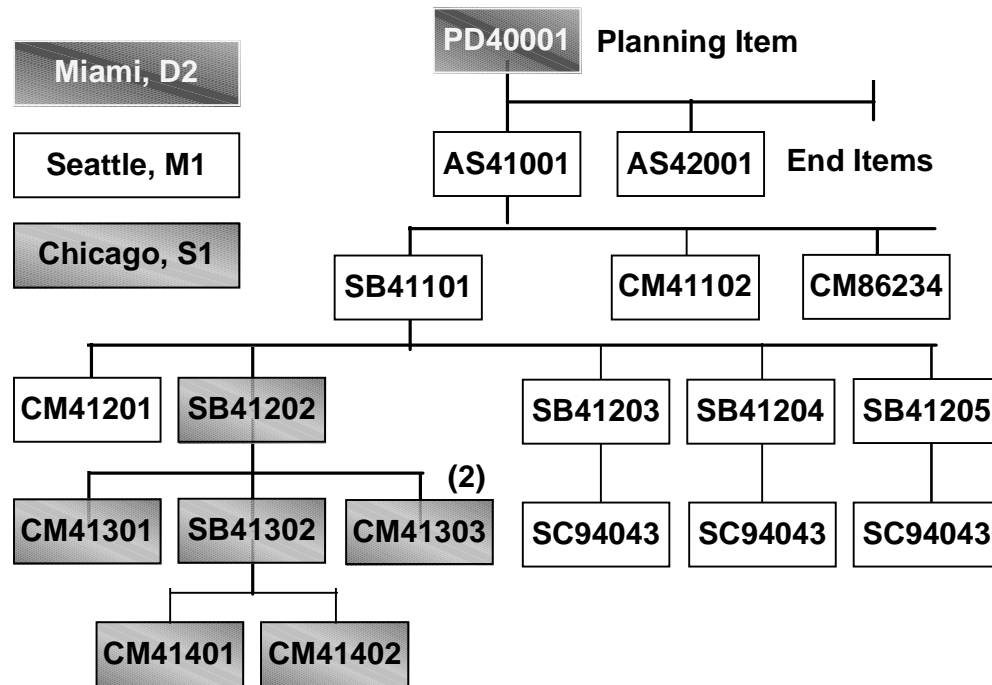
The link between item master and inventory organizations is established in the Organization Parameters window. In the figure, the Item Master Organization for Inventory Organization M1 is Vision Operations.

Organization Storage Capacity

The fields in the Capacity region of the Organization Parameters window are currently for information only. Modeling storage capacity of an organization in terms of weight or volume is future functionality. This region will define these parameters:

- Organization load weight capacity
- Weight unit of measurement (UOM)
- Organization volume capacity
- Volume UOM

Organization Assignment



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Assigning Items to Organizations

Each item number can be assigned to one or more inventory organizations. In the figure, item SB41202 is a subassembly that is manufactured in Chicago and then transferred to Seattle where it is consumed in the production of subassembly SB41101. Therefore, item SB41202 must be assigned to both the Chicago and the Seattle inventory organizations. To continue the example, if SB41101 is also sold as a service part from the Miami distribution center, the item must also be enabled there.

Organization Assignment

The screenshot shows the 'Organization Assignment (V1)' window. At the top, there are two input fields: 'Item' with the value 'AS41001' and 'PDA - Palmate'. Below these is a section titled 'Organization Assignment' with a checked checkbox. A table lists various organizations with columns for 'Org', 'Name', 'Primary Unit of Measure', and 'Assigned'. Organizations M1 and M2 have their 'Assigned' checkboxes checked. At the bottom, there are two buttons: 'Assign All' and 'Org Attributes'.

Org	Name	Primary Unit of Measure	Assigned
M1	Seattle Manufacturing	Each	<input checked="" type="checkbox"/>
M2	Boston Manufacturing	Each	<input checked="" type="checkbox"/>
M3	Dallas Manufacturing	Each	<input type="checkbox"/>
MA1	MAT_Inventory_Org	Each	<input type="checkbox"/>
MC	MLC2 MFG COMPANY	Each	<input type="checkbox"/>
MF1	MF Milan Distribution	Each	<input type="checkbox"/>
MF2	MF Paris Distribution	Each	<input type="checkbox"/>
MF3	MF San Francisco Distribution	Each	<input type="checkbox"/>
MF4	MF Buenos Aires Distribution	Each	<input type="checkbox"/>
MF5	MF Turin Distribution	Each	<input type="checkbox"/>

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Organization Assignment

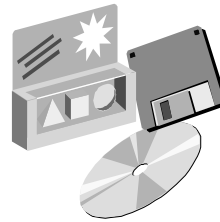
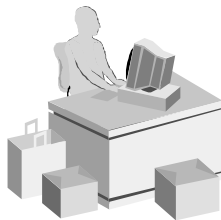
(N) Inventory—>Items—>Master Items (M) Tools—>Organization Assignment

Using the Assigned Check Box to Enable Organizations

After item attribute information is saved, the Organization Assignment function is enabled on the Tools drop-down menu. The Organization Assignment window opens when Organization Assignment is selected. Check the Assigned check box as desired to enable the item in organizations that report to this item master organization. In the figure, item AS41001 is shown as enabled in organizations M1 and M2. This item is also enabled in Vision Operations organization V1, since that is the item master organization used in this example.

Item Attributes

- **General planning: Make or Buy**
- **MPS/MRP planning: Planning method**
- **Physical attributes: Volume and weight**



Key Item Attributes

Item templates are used to set the numerous item attributes accurately. The figure lists some key item attributes affecting the supply chain. The general planning attribute; make or buy, directs replenishment sourcing. It determines whether the system should plan internal works orders and flow rates or plan external purchase orders. The planning method indicates which of the planning processes apply to this item. The horizontal and vertical strategy options of Oracle Supply Chain Planning carry over to Oracle Advanced Supply Chain Planning. These strategies are discussed in the lesson “Supply Chain Setup.” You can use the physical item attributes, volume and weight, to model transportation constraints. Future functionality will also model organization storage capacity.

Master Item: General Planning

The screenshot shows the 'Master Item (V1)' window with the 'General Planning' tab selected. The top section contains fields for Organization (V1), Vision Operations, Item (AS41001), and Description (PDA - Palmate). A 'Display Attributes' section has radio buttons for Master, Org, and All. Below this is a tabbed interface with 'Main', 'Inventory', 'Bills of Material', 'Costing', 'Purchasing', 'Receiving', 'Physical Attributes', and 'General Planning'. The 'General Planning' tab contains several sections: 'Inventory Planning Method' (Not Planned) with an arrow pointing to 'Planner' (Make or Buy: Make); 'Min-Max Quantity' (Minimum, Maximum); 'Order Quantity' (Minimum, Maximum); 'Cost' (Order, Carrying %); 'Source' (Type, Organization, Subinventory); 'Safety Stock' (Method: Non-MRP Planned, Bucket Days, Percent); and 'Fixed Order Quantity', 'Fixed Days Supply', and 'Fixed Lot Multiplier' at the bottom.

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Master Item: General Planning

(N) Inventory—>Items—>Master Items (T) General Planning

You specify the item attribute Make or Buy in the General Planning tabbed region. The figure shows that the finished good AS41001 is a manufactured item.

Master Item: MPS/MRP Planning

The screenshot displays the 'Master Item (V1)' window with the 'MPS/MRP Planning' tab selected. The top section shows the Organization as 'V1 Vision Operations', Item as 'AS41001', and Description as 'PDA - Palmate'. The 'Display Attributes' section has radio buttons for 'Master', 'Org', and 'All'. The main form area contains several tabs: 'Physical Attributes', 'General Planning', 'MPS/MRP Planning' (active), 'Lead Times', 'Work In Process', and 'Order Management'. In the 'MPS/MRP Planning' tab, the 'Planning Method' is set to 'MPS planning', 'Forecast Control' is 'Consume and derive', and 'Pegging' is 'None'. The 'Round Order Quantities' checkbox is checked. The 'Repetitive Planning' section includes an 'Overrun' field and 'Acceptable Rate' fields. The 'MPS Planning' section has a 'Calculate ATP' checkbox and a 'Reduce MPS' dropdown. At the bottom, there are 'Planning Time Fence', 'Demand Time Fence', and 'Release Time Fence' dropdowns, along with 'Days' input fields.

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Master Item: MPS/MRP Planning

(N) Inventory—>Items—>Master Items (T) MPS/MRP Planning

Planning Method

You specify the item attribute Planning Method in the MPS/MRP Planning tabbed region. The figure shows that the finished good, AS41001, is planned using the MPS planning method. This setting works with the plan type specification on the Plan Options form to select the items involved when launching a named plan. Refer to the lesson titled “ASCP Plan Options.”

Note: The Exception Set field must be completed to generate advanced supply chain planning exception messages.

Master Item: Physical Attributes

Master Item (V1)

Organization: V1 Vision Operations

Item: AS41001

Description: PDA - Palmate

Display Attributes: Master Org All

Main Inventory Bills of Material Costing Purchasing Receiving Physical Attributes General Planning

Weight: Unit of Measure: Kilogram Unit Weight: 1.1

Volume: Unit of Measure: Cubic centimeter Unit Volume: 350

Container: ☐ Container ☐ Vehicle

Container Type: Internal Volume: Maximum Load Weight: Minimum Fill Percent:

Type: ☐ Collateral Item ☐ Electronic Format ☐ Equipment ☐ Event ☐ Downloadable

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Master Item: Physical Attributes

(N) Inventory—>Items—>Master Items (T) Physical Attributes

Item Weight and Volume

You specify the item attributes weight and volume in the Physical Attributes tabbed region. The figure shows that the finished good, AS41001, weighs 1.1 kilograms and occupies 350 cubic centimeters of space. When you model transportation constraints, ASCP uses this weight and volume information to calculate transportation load.

Master Item: Order Management

Master Item (V1)

Organization: V1 Vision Operations

Item: AS41001

Description: PDA - Palmate

Display Attributes: Master Qrg All

Physical Attributes General Planning MPS/MRP Planning Lead Times Work In Process Order Management

☒ Customer Ordered
☐ Internal Ordered
☐ Ship Components
☐ Assemble to Order
☐ Ship Model Complete
☒ Returnable (S)
☐ RMA Inspection Required
☐ Activation Required

☒ Customer Orders Enabled
☐ Internal Orders Enabled

☒ Shippable
☒ OE Transactable

Check ATP
 ATP Rule
 ATP Components
 Picking Rule
 Default Shipping Organization
 Over Shipment Tolerance
 Under Shipment Tolerance
 Over Return Tolerance
 Under Return Tolerance

Material and Resource

None

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Master Item: Order Management

(N) Inventory—>Items—>Master Items (T) Order Management

Setting the Check ATP and ATP Components

You can enable multilevel ATP by setting the Check ATP and ATP Components fields; defining the supply chain; and defining manufacturing, supplier, and transportation capacity. In addition, the site-level profile option INV: Capable to Promise must be set to 4, Enable PL/SQL-Based ATP with Planning Output. Refer to “Oracle Global ATP Server Profile Options” in the *ASCP /Global ATP User’s Guide*.

At the item-organization level, the item attribute Check ATP is specified in the Order Management tabbed region of the item attributes form. This flag, in combination with the ATP Components flag located on the same tab, determines the level of the ATP check. The values selected from the drop-down menu for these two flags indicate what kind of ATP check you want to perform.

The figure shows that sales orders for the finished good, AS41001, will be checked by ATP promising for the material and transportation resource availability needed to meet the sales order promise date. However, the ATP Components flag is set to None. Therefore, the ATP check will not go to the component level even if there is not enough supply of this item.

For a list of values to enter for these flags and a discussion of the ATP check resulting from each combination of values, refer to “Enabling Multi-Level Supply Chain ATP, CTP, and CTD” in the *ASCP/Global ATP User’s Guide*.

BOM Check ATP

The screenshot shows the 'Bills of Material (M1)' window for item AS41001. The title bar indicates 'PDA - PALMATE DATA ASSISTANT'. The window includes fields for Item, Alternate, Revision (A), Date (24/FEB/2000 14:48:53), and Display (Future and Current). A 'Implemented Only' checkbox is checked. The main area has tabs for Main, Date Effectivity, Unit Effectivity, ECO, Component Details, Material Control, Order Entry, and Shipping. The 'Order Entry' tab is active, showing a table with columns for Item Seq, Operation Seq, Component, Check ATP, Optional, Mutually Exclusive, and Quantity (Minimum and Maximum). An arrow points to the 'Check ATP' checkbox for component SB41101.

Item Seq	Operation Seq	Component	Check ATP	Optional	Mutually Exclusive	Quantity
						Minimum Maximum
10	1	SB41101	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
20	1	CM41102	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
30	1	CM86234	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

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Bills of Material: Order Entry

(N) Bills of Material—>Bills—>Bills

BOM Level ATP Check

The ATP flag at the bill level can override the setting in the item organization attributes ATP Components flag discussed on the previous page. You can use these flags to enable ATP checks for a subset of the components listed on the bill.

Routings: Capable to Promise

The screenshot shows the Oracle Routing (M1) form. At the top, the 'Item' field is 'AS41001' and the 'Description' is 'PDA - Palmate'. The 'UOM' is 'Ea'. Below this, the 'Alternate' field is empty, and the 'Capable To Promise' checkbox is checked. The 'Revision' is 'A' and the 'Date' is '23/MAR/2001'. The 'Display' dropdown is set to 'Future and Current'. The 'Operations' section is visible, showing a table with columns: Seq, Code, Department, Effective, Disabled, Option Dependent, and Lead. The first row shows '10' in the Seq column, 'ASSEMBLY' in the Department column, and '23/MAR/2001' in the Effective column. The 'Option Dependent' column has a checkbox that is not checked. The 'Lead' column is empty. At the bottom of the form, there are three buttons: 'Routing Details', 'Routing Revisions', and 'Operation Resources'.

Seq	Code	Department	Effective	Disabled	Option Dependent	Lead
10		ASSEMBLY	23/MAR/2001		<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	
					<input type="checkbox"/>	

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Routings: Main

(N) Bills of Material—>Routings—>Routings

Capable-to-Promise Check

Manufacturing capacity is determined by the resources used on the primary routing for each manufactured item. To enable capable-to-promise checks, ensure that the Capable To Promise field is checked on the primary routing.

Item Carrying Costing

The screenshot shows the 'Organization Item (M1)' window for 'Seattle Manufacturing' with item 'AS41001' and description 'PDA - PALMATE DATA ASSISTANT'. The 'General Planning' tab is active, showing the 'Inventory Planning Method' as 'Not Planned' and the 'Planner' as 'C. Horton'. The 'Make or Buy' is set to 'Make'. In the 'Cost' section, the 'Carrying' cost is set to 70%. The 'Safety Stock' section shows the 'Method' as 'Non-MRP Planned'. The 'Source' section includes fields for 'Type', 'Organization', and 'Subinventory'. At the bottom, there are fields for 'Fixed Order Quantity', 'Fixed Days Supply', and 'Fixed Lot Multiplier'.

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Organization Item: General Planning

(N) Inventory—>Items—>Organization Items (T) General Planning

Modeling Carrying Costs

You can set up inventory carrying costs in two ways:

- Enter an annual inventory carrying cost percentage for the Profile option MSO: Inventory Carrying Costs.
- Enter an annual inventory carrying cost percentage for the organization item attribute in the carrying field in the cost region of the General Planning tab, as shown in the figure. Setting this field will override the profile option setting.

Note: The Inventory Turns optimization objective will have no effect if you do not set the carrying cost at either the item attribute level or the system profile level. A null value for the carrying cost percentage is interpreted as zero. When the zero factor is used to evaluate alternatives, any plan will appear to minimize inventory costs (zero).

Price List

Product Context	Product Attribute	Product Value	UOM	Price	Percent
Item	Item Number	AT23808	Ea	2349	
Item	Item Number	AS41001	Ea	200	
Item	Item Number	AS54888	Ea	1599	
Item	Item Number	AS92689	Ea	1999	
Item	Item Number	CM08830	Ea	150	

Buttons: Pricing Attributes, Price Breaks

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Price Lists: List Lines

(N) Order Entry—>Pricing—>Price Lists—>Price List Setup

Prices Used in Calculating Plan Profit

For the purposes of calculating plan profit, planning uses the price list specified in the Profile Option, MRP: Plan Revenue Price List.

In the figure, the CORPORATE price list shows that the price for end item AS41001 is 200 USD for each unit.

Master Demand Schedule

Item	Date	End Date	Number of Days	Current/Rate	Quantity
AS41001	02/APR/2001		1	4000	
AS41001	09/APR/2001		1	4000	
AS41001	16/APR/2001		1	4000	
AS41001	17/APR/2001		1	2400	
AS41001	23/APR/2001		1	4000	
AS41001	30/APR/2001		1	4000	
AS41001	07/MAY/2001		1	4000	
AS41001	14/MAY/2001		1	4000	

Source Information

Origination: **Forecast** Sales Order:

Org: **D2** Forecast/Schedule: **PDA_Miami**

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Item Master Demand Schedule Entries

(N) Supply Chain Planning—>MDS—>Entries

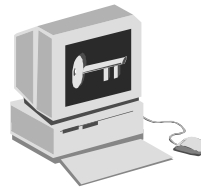
Statement of Demand

Manufacturing planning systems balance sources of supply in response to a variety of inputs. An important input in the planning process is a statement of demand, known as a master demand schedule (MDS). (See the lesson titled “Creating and Loading the Master Demand Schedule.”) Two general categories of demand included in an MDS are:

- Forecast demand, usually based upon a history of demand for this item or similar items
- Actual demand, based upon current sales order backlog demand for this item

Business Intelligence System (BIS) Setup

- **Key performance indicator (KPI) targets are set up in the BIS module**
- **The Planner Workbench compares KPIs of alternative plans against each other and against KPI targets**



Supply Chain Plan Key Performance Indicators (KPIs)

Prices and costs are used to evaluate plan profit, which is one of the supply chain plan performance indicators. KPI targets are set up in the BIS module. KPIs for each plan and simulated plan are automatically calculated and associated with the plan name or simulation name. The Planner Workbench is a graphical user interface that includes the capability to compare named plans and named simulations against each other and against targets.

Setting KPIs Without BIS

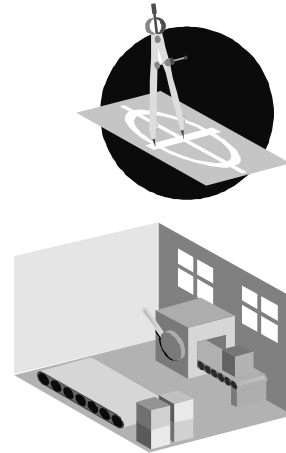
Oracle ASCP includes the ability to set the four performance management targets or KPIs from within Oracle ASCP. You are not required to purchase licenses for Oracle BIS to set the four KPIs used in ASCP. From within ASCP Planner Workbench, go to the Tools menu and select the option to set KPIs.

The four KPIs included in Oracle ASCP are:

- Inventory turns
- Margin percentage
- Planned utilization
- On-time delivery

Engineering

- **Bills of material**
- **Departments and resources**
- **Routings and standards**



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Engineering

The engineering module contains bills of material information describing how items are processed and assembled, department and resource capacities, and routings specifying which resources are used in the manufacture of specific items:

(N) Bills of Material—>Bills, Departments, Resources, Routings

(N) Flow Manufacturing—>Lines—>Departments, Lines

(N) Flow Manufacturing—>Product Sync—>Flow Routings

Flexfield Setup

- **Use of flexfields may be required for release 10.7 or 11 transactional instances**
- **Flexfields enable the capture of APS-specific parameters in pre-11*i* instances**

Release 10.7 and 11 Flexfield Setup

Modeling certain characteristics may require the use of flexfields already existing on release 10.7 or 11.0 transactional instances. The ASCP optimization option requires more information and is more likely to require the use of flexfields. Patches are provided to set up pre-11*i* instance flexfields for ASCP use in capturing specific parameters.

Penalty Factor Flexfields

- **Late demand (demand, item, or organization level)**
- **Exceeding material capacity (item/supplier, item, or organization level)**
- **Exceeding resource capacity (resource or organization level)**
- **Exceeding transportation capacity (shipping method or organization level)**
- **Cost of using alternative BOM or Routing (BOM form)**

Using Flexfields to Provide Penalty Cost Information

APS optimization produces plans seeking to attain the important objectives, while at the same time avoiding the most undesirable consequences. The relative importance of objectives is specified in the Plan Options window in the Optimization tabbed region. Undesired consequences are assessed default penalty costs in a general way at the same location. When refinements are desired, such as when missed due dates for some items is a bigger issue than missed due dates for other items, then more specific information is needed.

The figure lists several undesired consequences, such as late demand (satisfying demand after the due date). To make the optimization tradeoff, the system needs information regarding the relative importance of avoiding undesired consequences. For example, is it more important to avoid late demand than it is to avoid using alternative bills and routings? If so, then a higher penalty cost is associated with late demand, and a lower penalty cost is placed on the use of alternative bills and routings. The optimizer minimizes costs. When the optimizer must choose between use of alternative bills and routings or filling an order after its due date, the higher penalty cost of late demand will drive the solution toward the use of alternative bills and routings.

In releases 10.7 or 11, this specific penalty cost information is provided to the system through the use of flexfields.

Master Item: Main

Master Item (V1)

Organization: V1 Vision Operations

Item: AS41001

Description: PDA - Palmate

Display Attributes: Master Org All

Main Inventory Bills of Material Costing Purchasing Receiving Physical Attributes General Planning

Primary Unit of Measure: Each

User Item Type: Finished good

Item Status: Active

Conversions:

- ☐ Standard
- ☐ Item specific
- ☒ Both

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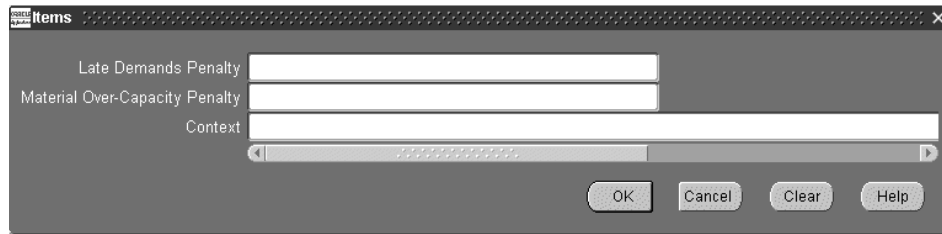
Master Item: Main

(N) Inventory—>Items—>Master Items (T) Main

The figure shows a flexfield located in the header region of the Master Item form.

The ASCP Optimization option enables this flexfield to open the window shown on the next page.

Master Item Flexfields

The screenshot shows a window titled "Items" with a close button (X) in the top right corner. Inside the window, there are three text input fields. The first field is labeled "Late Demands Penalty", the second is labeled "Material Over-Capacity Penalty", and the third is labeled "Context". Below the "Context" field is a horizontal scrollbar. At the bottom right of the window, there are four buttons: "OK", "Cancel", "Clear", and "Help".

Items

(N) Inventory—>Items—>Master Items [Flexfield]

Item Level Penalty Factor Information

The ASCP Optimization option takes penalty factor information entered on this form into account when making plan optimization calculations. If this information is left blank, default penalty factor information is obtained from the Optimization tabbed region of the Plan Options form. Refer to the lesson titled “Constraint-Based Planning and Optimization.”

Resource Scheduling Flexfield Setup

- **Aggregate resource assignment**
- **Simultaneous resource sequence**
- **Alternative resources for an operation**
- **Priority of alternative resources for an operation**
- **Priority for substitute items**

Simultaneous and Alternative Resource Scheduling

A new feature with the release 11i is the capability to schedule simultaneous resources used in a routing. Simultaneous resource scheduling enables you to schedule two or more resources at the same time without the limitations of previous workarounds, such as using the Schedule Yes and Schedule No features on the Routings Operations Resources form.

A simultaneous resource is used at exactly the same start and end times as the principal resource it is paired with. More than one resource can be used simultaneously with the principal or primary resource. At least one resource must be designated as the principal resource.

Using Alternative Resources

A feature of the ASCP module is the ability to recommend planned orders using an alternative resource. This applies both to constrained plans and to optimized plans. The HLS engine schedules WIP jobs using an alternative resource when the capacity of the primary resource is exhausted and capacity is available for an alternative resource. If the first alternative resource does not have available capacity, then the second alternative resource is recommended if it has available capacity, and so on.

Scheduling Alternative and Simultaneous Resources

Operation Resources (M2)

Item: IN31102 Alternate: Sequence: 20 Effective Date: 12/OCT/2000

Resources

Main Scheduling Costing

Seq	Resource	Available 24 Hours	Assigned Units	Schedule	Offset %	
10	LBR-FAB	<input type="checkbox"/>	2	Yes		...
20	IN-SANDER	<input checked="" type="checkbox"/>	1	No		..
30	IN-SANDER	<input checked="" type="checkbox"/>	1	No		..
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				
		<input type="checkbox"/>				

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Operation Resources

(N) Bills of Material—>Routings—>Routings (B) Operations Resources

Flexfields

Details regarding flexfield setup are provided in the *ASCP/Global ATP Users Guide*. The following pages provide an example of flexfield use to schedule alternative and simultaneous resources.

Simultaneous resource scheduling is implemented using flexfields in release 11*i*. For APS servers integrated with release 10.7 and release 11 instances, the same flexfields are installed in the source instance. Oracle APS constrained and optimized calculations plan the simultaneous resources. Therefore, simultaneous resource scheduling is available for release 10.7 and release 11 instances that are integrated with Oracle APS.

The flexfield shown in the Operation Resources window is used to enter information to control simultaneous and alternative resource scheduling. The Operation Resource Information window shown on the next page opens when you click the flexfield indicated in the figure above.

Resource Scheduling Flexfields

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Operation Resource Information

(N) Bills of Material—>Routings—>Routings (B) Operations Resources[Flexfield]

Simultaneous and Alternative Resource Scheduling Example

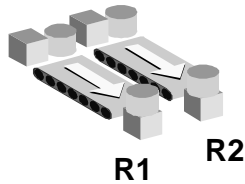
In the following table, the Operation Sequence values are from the Routings window, and the Resource Sequence and Resource Name values are from Operation Resources window. The remainder of the data is placed in the Operation Resource Information window flexfields displayed in the figure.

<u>Operation Sequence</u>	<u>Resource Sequence</u>	<u>Resource Name</u>	<u>Resource Priority</u>	<u>Principle Resource</u>	<u>Resource Step Number</u>
10	10	R1	1	Yes	10
10	20	R2	1	No	10
10	30	R1	2	Yes	10
10	40	R4	2	No	10
10	50	R3	1	Yes	20

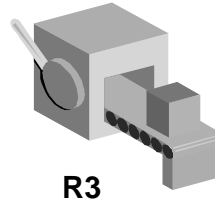
The results of the example setup are explained on the next page.

Resource Scheduling Example Results

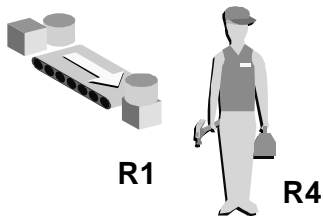
Priority 1, Step 10



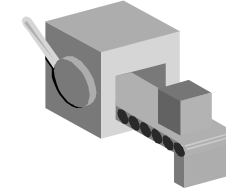
Priority 1, Step 20



Priority 2, Step 10



Priority 2, Step 20



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Simultaneous and Alternative Resource Scheduling Example Results

Operation Sequence	Resource Sequence	Resource Name	Resource Priority	Principle Resource	Resource Step Number
10	10	R1	1	Yes	10
10	20	R2	1	No	10
10	30	R1	2	Yes	10
10	40	R4	2	No	10
10	50	R3	1	Yes	20

Resources R1 and R2 are scheduled to be used together (simultaneously). An alternative (priority 2) calls for resources R1 and R4 used together to accomplish the same work. Regardless of whether the first or the alternative choice is made, resource R3 is scheduled to follow (step 20).

The resource step number indicates the processing sequence. Within a resource step number, resource priority indicates groups of alternative resources. In the above example, within resource step number 10, there are two resource priorities: 1 and 2. So the choice of alternatives comes down to (1) use all of the resources within resource priority 1 as a group or (2) use the group of resources with priority 2.

Note that this applies to resources within step number 10 only. Within each resource step number, there must be at least one resource with Principle Resource = Yes. This Yes flag value designates the primary resource, whose use does not incur a “use of alternative resource” implicit penalty cost.

Summary

In this lesson, you should have learned how to:

- **Identify data setup in transactional modules that is collected into APS**
- **Set up the transaction system to enable ASCP functionality**
- **Discuss the use of flexfields to accommodate APS-specific data**

Summary

Supply chain modeling requires set up in inventory, engineering, purchasing, and supply chain planning modules. Some new fields in the organization parameters and approved supplier list are used to model constraints. The ASCP system uses setup information from the transaction systems. There is no need to perform redundant setup efforts to use ASCP.

Practice 3-1 Overview

This practice covers completing Part I of the APS case study:

- **Setting up profile options**
- **Setting up inventory items**
- **Setting up bills of material**
- **Setting up resources, departments, and flow lines**
- **Setting up discrete and flow routings**

Performing Practice 3-1

For detailed instructions on performing this practice, see Part I in Appendix B, “Case Study.”

4

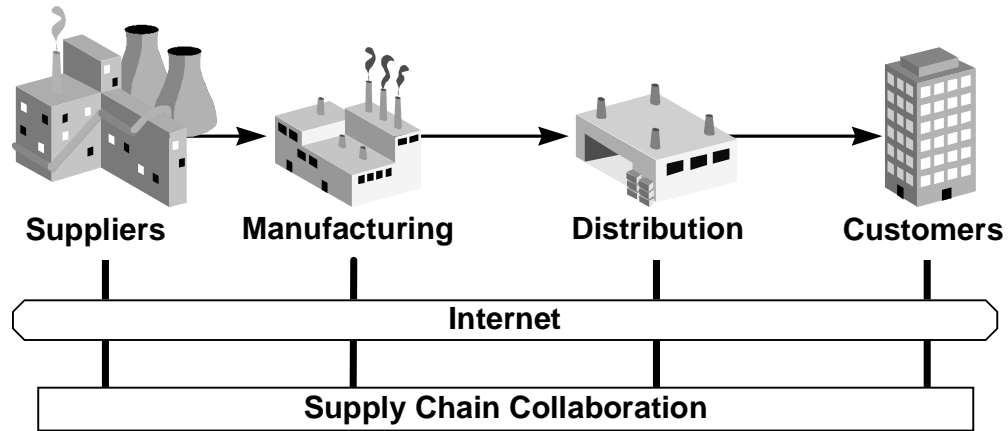
Supply Chain Setup

Objectives

After completing this lesson, you should be able to do the following:

- **Set up supply chain relationships in transaction instances**
- **Discuss the use of flexfields to accommodate APS-specific data**

Modeling the Supply Chain



4-3

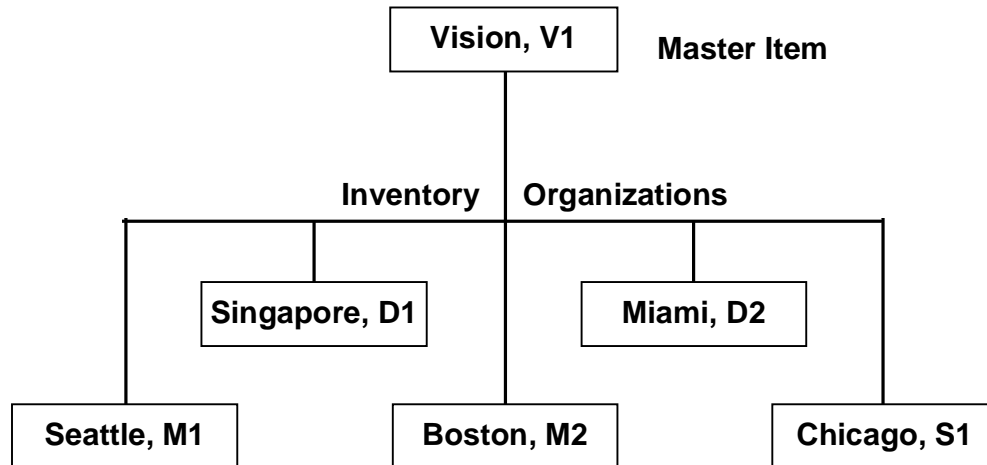
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Overview: Modeling the Supply Chain

Note: If you have implemented Oracle supply chain manufacturing applications, release 10.7 or later, no additional supply chain set up is required.

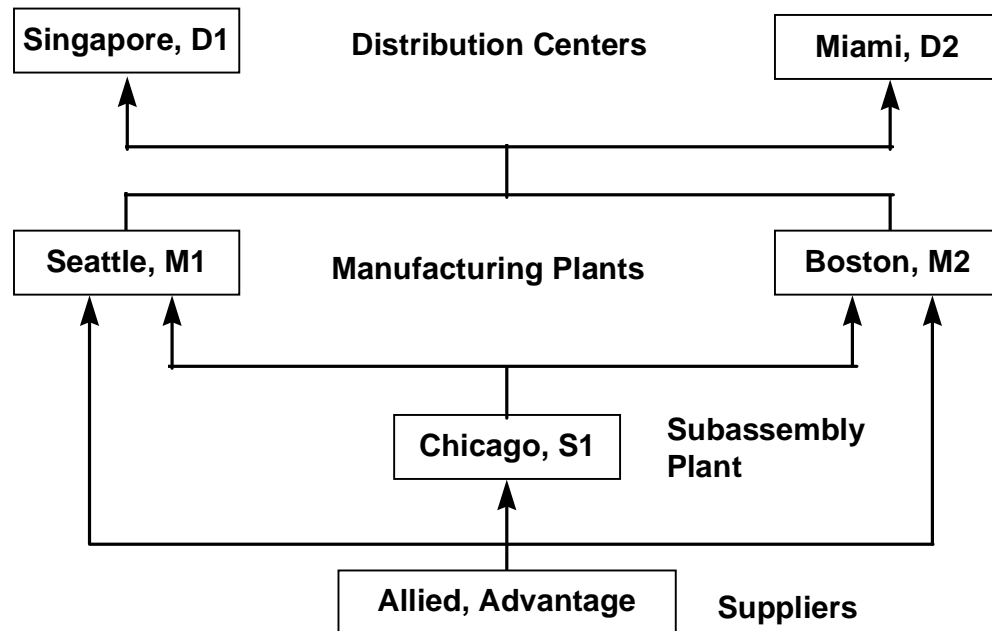
Inventory Organization Structure



Inventory Organization Structure

The inventory organization structure is an important prerequisite to specifying item attribute information. Inventory items are defined in the master item and then enabled in one or more inventory organizations. For inventory organizations to become valid LOV choices in the Organization Assignment window, the relationship between each inventory organization and its master item organization must have previously been defined in the Inventory Parameters tabbed region of the Organization Parameters window.

Supply Chain Structure



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Supply Chain Structure

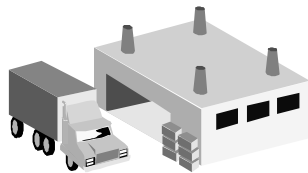
Supply chain structure is different from inventory organization structure. While the inventory organization structure is static and limited to two levels (master organizations and inventory organizations), the supply chain model is dynamic, involves many levels, and can become complex.

Some of the situations that increase supply chain model complexity are:

- Multilevel, multi-organization supply chains
- Mixed-mode manufacturing methods (discrete, flow, process, project)
- Disparate software releases and legacy software systems
- Identical items obtained from more than one supplier
- Different suppliers preferred by different inventory organizations
- Manufacturing, supplier, and transportation capacity constraints
- Varied delivery frequencies and transit times by item, supplier, and shipping method
- Scarce resources allocated by demand priority
- Operations routed to outside suppliers
- Alternative routings used to alleviate bottlenecks and to balance resource utilization

Modeling Transportation Capacity

- **Capacity between organizations:**
 - Shipping networks
 - Shipping methods
- **Capacity between external sites and organizations:**
Inter-location transit time



Transportation Capacity Entry

You can use either of two forms to enter transportation capacity between locations, depending on whether you want to specify transportation capacity between two inventory organizations or between external sites and inventory organizations. Transportation capacity setup details follow this page.

Transportation Capacity Between Organizations

For interorganizational transfers, Advanced Supply Chain Planning uses transportation capacity entered on the Shipping Methods form for each interorganization network link. First you navigate to the Shipping Networks form. Click the Find button and select the particular interorganization network link that you want to set up. From the menu bar, select Tools—>Shipping Methods to open the Inter-Org Shipping Networks form, where you can enter shipping methods, transportation time, and weight and volume capacity for each shipping method.

Transportation Capacity Between External Sites and Organizations

Use the Inter-Location Transit Times window to enter transit times from supplier and customer locations to an inventory organization. You can also specify shipping capacities.

Note: If you use the Inter-Location Transit Times form to enter transit times and transportation capacities between inventory organizations, that information will not be used by ASCP.

Note: The windows for entering transportation capacities are new release 11*i* forms. They are not available in release 10.7 or release 11 source instances. At the time this document was written, you cannot model transportation capacities on the ASCP planning server instance. Therefore, if your source system uses one of these earlier releases, modeling transportation capacity involves substantial custom programming.

Shipping Methods

Application Utilities: SHIP_METHOD Lookups

Type: SHIP_METHOD
 User Name: SHIP METHOD
 Application: Oracle Inventory
 Description: Ship Method

Access Level:
☐ User
☒ Extensible
☐ System

Effective Dates: From To Enabled

Code	Meaning	Description	Tag	From	To	Enabled
AIR	Air Freight	Use Air Freight as Car		14/MAY/1997		<input checked="" type="checkbox"/>
AIRWAY	AIRWAY					<input checked="" type="checkbox"/>
CONSOLIDATED	CONSOLIDATED					<input checked="" type="checkbox"/>
RAIL	Rail Road	Use Railroad as Carrier		14/MAY/1997		<input checked="" type="checkbox"/>
SDF	dfg					<input checked="" type="checkbox"/>
SHIP	Overseas Freight	Use Ship as Overseas		14/MAY/1997		<input checked="" type="checkbox"/>
TRUCK	Truck	Use Truck as Carrier		14/MAY/1997		<input checked="" type="checkbox"/>
						<input type="checkbox"/>
						<input type="checkbox"/>
						<input type="checkbox"/>

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Application Utilities: SHIP_METHOD Lookups

(N) Inventory—>Setup—>Organizations—>Shipping Method

Shipping Method

This form is used to set up a valid list of values (LOV) for shipping method fields. The shipping method is the mode of transport used to convey goods from one location to another. Shipping methods are user defined and then assigned to each shipping network from-to link. Examples of valid shipping methods include:

- Maritime
- Rail
- Truck
- Air
- LTL (less than truck load)
- Customer pick-up
- Best way

Shipping method definition can be extended to support the concept of service:

- Next-day air
- Second-day ground
- Terms of delivery

Defining Shipping Methods

Enter a code, meaning, description, and effectivity dates.

Shipping Networks

From	To	Transfer Type	FOB	Receipt Routing	Internal Order Required
M1	D1	Intransit	Shipment	Direct	<input checked="" type="checkbox"/>
M1	D2	Intransit	Receipt	Standard	<input checked="" type="checkbox"/>
M1	JDS	Intransit	Receipt	Standard	<input checked="" type="checkbox"/>
M1	M2	Intransit	Receipt	Direct	<input checked="" type="checkbox"/>
M1	M3	Direct			<input checked="" type="checkbox"/>
M1	MAS	Direct			<input type="checkbox"/>
M1	P1	Intransit	Receipt	Direct	<input checked="" type="checkbox"/>

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Shipping Networks

(N) Inventory—>Setup—>Organizations—>Shipping Networks

Transportation Links

Shipping networks define transportation links from one organization to another organization. If traffic flows in both directions, two transportation links must be defined: from organization A to organization B, and from organization B to organization A. The figure shows links originating at M1 with destinations D1, D2, and so on.

The network includes routes, lanes, zones and locations. Lanes are single origin and destination pairs that can be established at any level of a geographic hierarchy (address, postal code, city, county, state, country, zone). A set of consecutive lanes from an origin to an ultimate destination form a route.

Any node (origin or destination point) on a lane is a location. Examples of locations include:

- Supplier site
- Customer site
- Inventory organization
- Carrier terminal
- Third-party managed external warehouse
- Customs zone
- Port

For a shipment, a route is an ordered sequence of lane segments from point of origin to point of ultimate destination.

Inter-Org Shipping Networks

Shipping Method	Intransit Time	Daily Capacity	Load Weight	UOM	Cost Per Unit
AIR	2	1000	KG	10	
SHIP	10				

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Inter-Org Shipping Networks

(N) Inventory—>Setup—>Organizations—>Shipping Networks (M) Tools—>Shipping Methods

Transit Between Organizations

In the figure, two shipment methods are set up for the inter-org network link from inventory organization M1 to inventory organization D1. The shipment method AIR requires two days of lead time and is limited by weight to one metric ton. The default shipment method is selected by a check box that is located on this form off the screen to the right of the area displayed in this figure.

The shipment method SHIP requires 10 days of lead time and has no capacity limits.

You can specify the transportation time, weight capacity constraints, and volume capacity constraints by shipping method and by direction. For example you can model transportation time by rail from organization A to B as six days, and transportation time by rail from organization B to A as four days.

Transportation Constraints

From Location	Description	To Location	Description
M1- Seattle	Seattle Mfg Plant 1 used in O	Chicago	Chicago Warehouse
M1- Seattle	Seattle Mfg Plant 1 used in O	D1- Singapore	Singapore Dist Cntr 1 used in
M1- Seattle	Seattle Mfg Plant 1 used in O	D2- Miami	Miami Distribution Center 2 us
M1- Seattle	Seattle Mfg Plant 1 used in O	Loc-ATPOne-1	Location 1 for ATP One
M1- Seattle	Seattle Mfg Plant 1 used in O	Loc-ATPOne-2	Location 2 for ATP One

Shipping Method	Intransit Time	Daily Capacity	Load Weight UOM	Cost Per Unit	€
AIR	1				
RAIL	2				
TRUCK	3				

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Inter-Location Transit Times

(N) Inventory—>Setup—>Organizations—>Inter-Location Transit Times

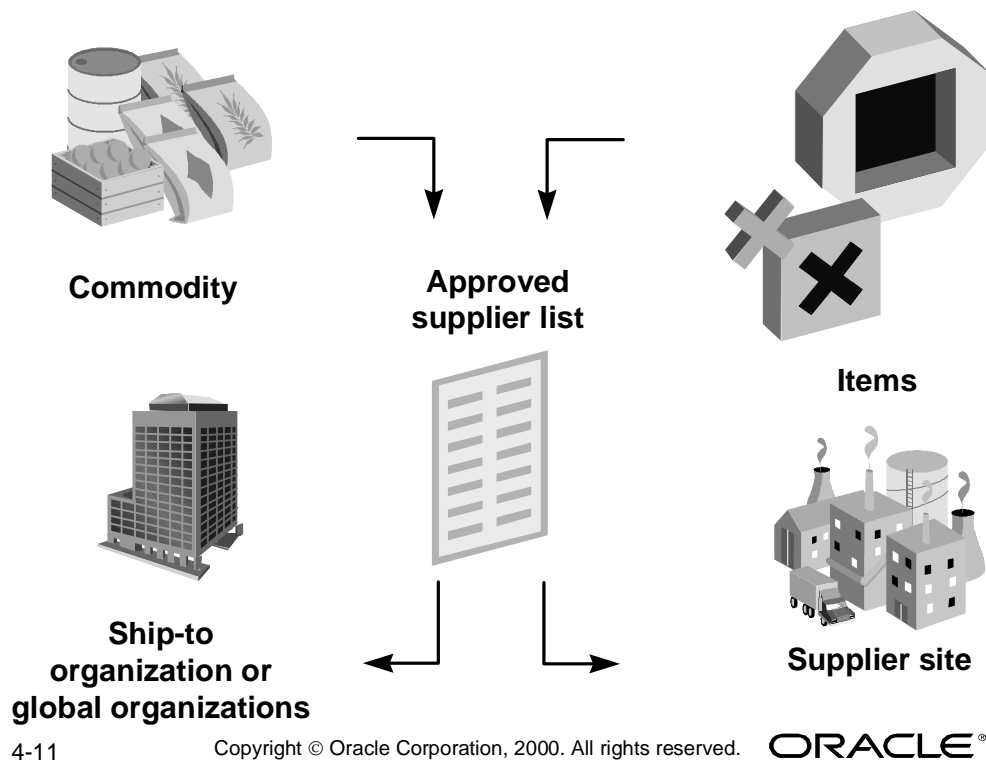
Transit Between Locations

You use this form to model transportation capacity between external sites and organizations. Note that this form uses From Location and To Location fields instead of the From Org and To Org fields that appear on the Inter-Org Shipping Networks window. This form models transportation time, weight capacity constraints, and volume capacity constraints by shipping method and by direction between locations, and not between inventory organizations.

To enable you to model transportation capacity by lane, in the Inter-Location Transit Times window the following fields have been added in release 11i to the right of the Intransit Time field:

- Daily load weight capacity
- Load weight unit of measurement (UOM)
- Cost per unit load weight
- Currency
- Daily volume capacity
- Volume UOM
- Transportation lead time by mode

Approved Supplier List (ASL)



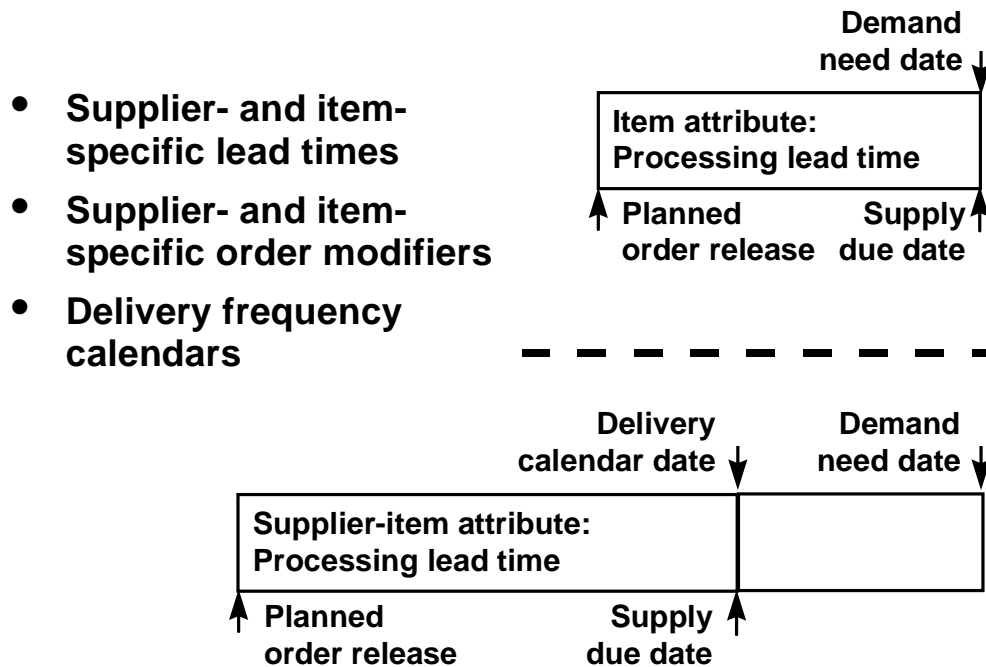
Approved Supplier List

Procurement organizations maintain lists, either formally or informally, that associate the items and services they buy with the companies that supply them. An approved supplier list (ASL) is a controlled global repository of information that links items and commodities to the suppliers and supplier sites that provide them for a specific ship-to organization or for the entire enterprise.

This repository includes information about all suppliers with business statuses ranging from:

- **Approved:** The supplier has demonstrated the ability to satisfy rigorous quality, cost, and delivery requirements over a sustained period.
- **Debarred:** The supplier is temporarily or permanently disallowed on purchase orders because of performance failure, ethics violations, and so on.
- **New:** You have never placed a purchase order with the supplier.

ASL Enhancements



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Enhanced Sourcing

Enhanced sourcing provides greater accuracy and flexibility in making sourcing allocations during the planning process. You can define supplier-specific order modifiers by item and by supplier site. This enables you to more precisely specify the conditions related to each source. Planning respects the order modifier quantities defined for the sources of the item. You can specify supplier- and item-specific lead times. This ensures that your orders are placed early enough to provide the selected supplier adequate time to react to your demand for each item.

Adjusting the Lead Time Offset for Valid Delivery Dates

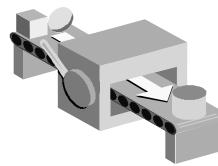
You can use delivery and reception frequency calendars to specify valid delivery dates for your supplier and item combinations. The calendar defines the dates that an organization can receive an item from each supplier.

The upper part of the figure shows previous functionality. MRP uses item attribute lead time offsets to align supply order due dates with demand dates of need.

You can now set up planning to adjust planned order release dates so that deliveries occur on valid delivery dates. The lower part of the figure shows demand that does not occur on a valid delivery date. The supplier-item specific processing lead time is offset from the delivery calendar date to arrive at an adjusted planned order release date.

ASL Enhancements

- **Allocate purchase orders based on capacity constraints**
- **Use flexible tolerance fences to model supplier capacity constraints that can change with advance notice**



Allocating Purchase Orders Based on Supplier Capacity Constraints

You can specify the capacity of individual suppliers to supply specific items. You can allocate planned orders while taking into account the capacity constraints of the suppliers. Planning uses the ranking information that you specify. It first attempts to source the planned orders with the primary sources. If the primary sources do not have enough capacity to fulfill the demand, the planning process suggests sourcing with the alternative sources that you have specified, in the rank sequence that you have specified.

Defining Flexible Tolerance Fences

For each source, you can define capacity tolerance percentages that vary over time. This enables you to allocate demand by a variable percentage over capacity, depending on how far into the future the demand will occur. For example, if a supplier can increase capacity if given sufficient notice, you can set a flexible tolerance fence to allocate demand up to 100% of the supplier's capacity inside of the tolerance fence, and up to 160% of the supplier's capacity outside of the tolerance fence.

ASL Enhancements

- **Allocate planned orders based on historical allocations**
- **Disable ASL entries**



Allocating Demand Based on the History of Allocations

Historical allocations are taken into account when allocating planned orders to sources. Planning uses history to determine the allocations necessary to achieve your targeted allocations.

Note: You can control the range of history used in the allocation calculation by using the From and To effective date fields in the Sourcing Rule window.

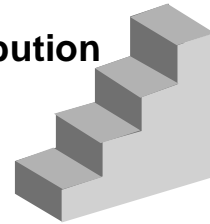
Disabling ASL Entries

You can disable an ASL entry, preventing its use by Purchasing and Supplier Scheduling. You can also reenable the disabled entry.

Note: Except for Disable ASL entries, you specify this information in the Planning Constraints tabbed region of the Supplier-Item Attributes window. You enable and disable ASL entries in the Key Attributes tabbed region of the Approved Supplier List window.

Enhanced Sourcing Setup Steps

- **Define delivery calendar**
- **Define approved suppliers**
- **Assign supplier-item attributes**
 - **Delivery calendar**
 - **Order processing lead time and quantity modifiers**
 - **Supplier capacity and tolerance**
- **Define sourcing rules and bills of distribution**
- **Specify the assignment set**



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Setting Up Supplier-Item Attributes

The next several pages describe the process of setting up the supplier-item attributes to make use of the new enhanced sourcing features.

New Features

- Delivery calendar sets valid delivery dates by organization, supplier, and item
- Approved supplier list:
 - Check box to disable an ASL entry
 - Global entry on the Record Details tab of the Approved Supplier List window enables the Planning Constraints tab on the Supplier-Item Attributes window
- Supplier-Item Attributes window, Planning Constraints tabbed region:
 - Default order processing lead time
 - Default order quantity modifiers
 - Delivery day calendar
 - Date effective supplier capacity
 - Supplier capacity tolerance fences
- Sourcing rules and bills of distribution
- Revised allocation and ranking rules

Supplier-Item Attributes

- **Processing lead time**
- **Delivery calendar**
- **Order modifiers**
- **Capacity**
- **Tolerance fences**



Assigning Supplier-Item Planning Constraints

The following attributes are defined in the Planning Constraints tabbed region of the Supplier-Item Attributes window.

Processing Lead Time

This supplier-item attribute overrides the organization item attribute for processing lead time.

Delivery Calendar

Planning adjusts planned order release dates so that deliveries occur on the valid delivery date that coincides with the due date or is the closest valid delivery date occurring prior to the due date. If no delivery calendar is defined, then the system assumes that all days are acceptable for receiving.

Order Modifiers

This supplier-item attribute overrides the organization item order modifier attributes for the minimum order quantity and lot size multiple.

Capacity

This supplier-item attribute represents supplier-item daily capacity in the purchasing UOM. Effectivity dates enable time-phased capacity modeling.

Tolerance Fences

You use the Tolerance % and the Days Advance Notice fields together to state by what percentage your supplier can change capacity if given a number of days advance notice. You can make multiple entries to represent the percentage change in capacity allowed with different days of advance notice.

Approved Supplier List (ASL)

Type	Commodity	Item	Description
Item		CM41401	Integrated Circuit

Suppliers

Key Attributes Record Details Comments

Business	Supplier	Site	Status	Disabled	Supplier Item	Manufacturer
Direct	Advantage Corp	ADVANTAGE -	{Approved}	<input type="checkbox"/>		
Direct	Allied Manufacturi	ST. LOUIS	{Approved}	<input type="checkbox"/>		
				<input type="checkbox"/>		
				<input type="checkbox"/>		
				<input type="checkbox"/>		

Attributes

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Approved Supplier List

(N) Purchasing—>Supply Base—>Approved Suppliers List (T) Key Attributes

Approved suppliers can be specified by item or commodity, and by organization.

Supplier Constraints

Enhanced sourcing available with release 11 provides the ability to model flexible supplier capacity.

Approved Supplier List: Record Details

The screenshot shows the 'Approved Supplier List (M1)' window. At the top, there are fields for Type (Item), Commodity, Item (CM13139), and Description (8GB Hard Drive). Below these is a 'Suppliers' section with three tabs: Key Attributes, Record Details, and Comments. The 'Record Details' tab is selected, displaying a table of suppliers. An arrow points to the 'Global?' dropdown menu, which is set to 'Yes'.

Business	Supplier	Site	Status	Disabled	Global?	Owning Org
Direct	Star Gate Ltd	STAR GATE - E	Approved	<input type="checkbox"/>	Yes	Seattle Manufact
Direct	Star Gate Ltd	STAR GATE - E	Approved	<input type="checkbox"/>	No	Seattle Manufact
Direct	Advanced Network	SANTA CLARA	Approved	<input type="checkbox"/>	Yes	Seattle Manufact
Direct	Advanced Network	SANTA CLARA	Approved	<input type="checkbox"/>	No	Seattle Manufact

At the bottom right of the window is an 'Attributes' button.

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Approved Supplier List (continued)

(N) Purchasing—>Supply Base—>Approved Suppliers List (T) Record Details

Note: The Planning Constraints tab on the Supplier-Item Attributes window is accessible only when the ASL entry includes an item and supplier number and the Global field is set to Yes as shown on the figure. The setting on this field can not be changed after you save your work.

Click the Attributes button to open the Supplier-Item Attributes window shown on the next page.

ASL Supplier Constraints

Supplier-Item Attributes (S1)

☒ Global ☐ Local

Item: **CM41301** Commodity:

Supplier: **Advantage Corp** Site: **ADVANTAGE -**

Purchasing UOM: Release Method:

Price Update Tolerance: % Country of Origin:

Source Documents | **Supplier Scheduling** | Planning Constraints

Processing Lead Time: Delivery Calendar:

Order Modifiers

Minimum Order Quantity: Fixed Lot Multiple:

Capacity

From Date	To Date	Capacity per Day
19/APR/2001		700

Tolerance Fences

Days in Advance	Tolerance %
40	60

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Supplier-Item Attributes

(N) Purchasing—>Supply Base—>Approved Suppliers List (B) Attributes

Supplier Capacity Planning Constraints

Suppliers' capacity constraints are specified in the Planning Constraints tabbed region of the Supplier-Item Attributes window. This example shows that supplier Advantage Corp. at Site ADVANTAGE - US has a production capacity limit of 700 units per day of item CM41301.

ASCP uses the information in the Tolerance Fences region to model supplier-item capacity constraints that are flexible with advance notice. The figure is set up for Advantage to be able to increase capacity by 60% if given 40 days advance notice.

Note: The Planning Constraints tab is accessible only when the ASL entry includes an item and supplier number and is a global entry. (See the previous page.) The flexible tolerance percentages are independent of the capacity constraints. In other words, tolerance percentages are not matched to capacity within a specific date effectivity range.

Also located on this tab is a Delivery Calendar name field. The delivery calendar is used to establish valid delivery days by supplier, item, and organization. For example, a supplier makes weekly Monday deliveries to a particular organization. A delivery calendar named "Mondays" is set up for valid deliveries on Mondays only. (See the next page.) The planning system will then offset planned purchase order release dates by the number of days in Processing Lead Time field plus the number of days necessary to cause the delivery to your dock to occur on a Monday.

The processing lead time is the supplier's lead time to your dock. If this value is left blank on this form, this information is obtained from the organization item attribute Processing Lead Time.

Delivery Calendar

The screenshot shows a window titled "Workday Calendar". It contains the following fields and controls:

- Name:** A text field containing "Mondays".
- Description:** A text field containing "Mondays Only".
- Quarterly Type:** A drop-down menu showing "4/4/5 Week Pattern".
- Calendar Date Range:** A section with two rows of date and day selection:
 - From:** "01/JAN/2000" and "Saturday".
 - To:** "01/JAN/2004" and "Thursday".
- Buttons:** At the bottom, there are three buttons: "Workday Pattern", "Shifts", and "Dates".

Workday Calendar

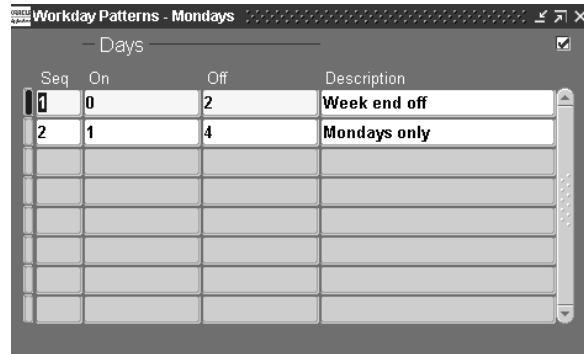
(N) Inventory—>Setup—>Organizations—>Calendars

How to Set Up Delivery Calendars

You use the Workday Calendar window to set up delivery calendars as well as workday calendars.

1. Enter a calendar name and description.
2. Specify the Quarterly Type value by selecting from the drop-down menu. Select from 4/4/5 Week Pattern, 5/4/4 Week Pattern, Calendar Months, or 13 Periods.
3. In the Calendar Date Range region, specify the effectivity dates for the calendar.
4. Save your work.
5. Click the Workday Pattern button to open the Workday Pattern window. See the next page.

Delivery Days



Seq	On	Off	Description
1	0	2	Week end off
2	1	4	Mondays only

Workday Patterns

(N) Inventory—>Setup—>Organizations—>Calendars (B) Workday Pattern

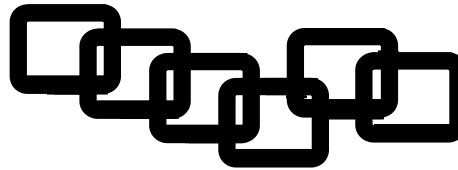
How to Set Up Delivery Patterns

You use the Workday Pattern window to set up valid delivery days.

1. On the Workday Patterns window, enter the sequence number and days on and days off.
Valid delivery days are days set to On.
2. Save your work.
3. From the menu bar select Tools—>Build to build your calendar.

Supply Chain Links

- **Sourcing rules**
- **Bills of distribution**
- **Assignment sets**



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Supply Chain Links

Supply chain complexity is managed through the use of sourcing rules, bills of distribution, and assignment sets. Taken together, these forms specify how material is supplied, manufactured, and transferred across a supply chain. When you create sourcing rules and bills of distribution, you create descriptions of the means by which you will replenish items. However, item numbers are not specified anywhere on the definition forms, so a defined sourcing rule or bill of distribution can later be assigned to any items or groups of items. You use assignment sets (shown later in this lesson) to associate specific item numbers with the sourcing rules and bills of distribution.

For example, a simple sourcing rule named SR-S1 is set up in Chicago with the thought that it would apply to all items that are purchased from supplier A. In the Assignment Set window, an assignment set name, such as ASN-S1, is created in the header, and in the Assignments region, sourcing rule SRS1 is assigned to item CM41401. Finally, the assignment set name is specified in the Plan Options tabbed region for a named MRP plan. Then the named MRP plan will call for replenishment in Chicago for item CM41401 to be sourced from supplier A.

The following pages explain how to set up sourcing rules, bills of distribution, and assignment sets.

Sourcing Rules

Sourcing Rule (M1)

Name: **RM-M1** ☐ All Orgs ☒ Planning Active

Description: **Purchased material - Seattle** ☐ Org: **M1** [Copy From...](#)

Effective Date

From Date: **24/MAR/2001** To Date: []

Shipping Organization

Type	Org	Supplier	Supplier Site	Allocation %	Rank	Shipping Method	Intransit Time
Buy From		Allied Manufac	ST. LOUIS	100	1		
Buy From		Advantage Co	ADVANTAGE -	100	2		

[View](#) [Purge](#) [Copy Shipping Orgs From...](#) [Assignment Set...](#)

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Sourcing Rule

(N) Supply Chain Planning—>Sourcing—>Sourcing Rules

Allocation and Rank

Sourcing rules and bills of distribution determine the movement of material between organizations. These organizations include supplier, manufacturing, and distribution facilities. The rules for allocation and rank have changed for release 11i. The total allocation percentage for all sources within a rank must add up to 100%. The sources with the highest rank (lowest numerical value) will have the highest priority in allocations. When sources of the highest rank have no more capacity, allocation will be performed for sources in the next highest rank.

When you select the All Orgs radio button, you define a global sourcing rule applying to receipts at all organizations. When you select the Org radio button and enter an organization code in the adjacent field, you create a sourcing rule that applies to just one organization.

The three types of sources are:

- **Transfer From:** Interorganization shipping functionality accomplishes the transfer between internal organizations. Enter the source organization in the Org column.
- **Make At:** The item is manufactured at this internal organization. Enter the manufacturing organization in the Org column.
- **Buy From:** Purchase the item from an external enterprise. Data entry in the Supplier and Supplier Site columns will be enabled, and the Org column will be disabled.

In this example, items assigned sourcing rule RM-M1 will first be purchased from Allied Manufacturing. Demand in excess of Allied's capacity will be placed with Advantage Corp.

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Bills of Distribution

Bill of Distribution

Name: **SCP-DC** ☒ Planning Active

Description: **Supply Chain BOD to Distribution Centers** []

Receiving Organization

Org	Customer	Address	From Date	To Date
M1			12/MAR/2001	
M2			01/DEC/2000	
D2			07/OCT/2000	

Shipping Organization

Type	Org	Supplier	Supplier Site	Allocation %	Rank	Shipping Method	Intransit Time
Transfer From	M2			100	2	AIR	2
Transfer From	M1			100	1	AIR	1

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Bill of Distribution

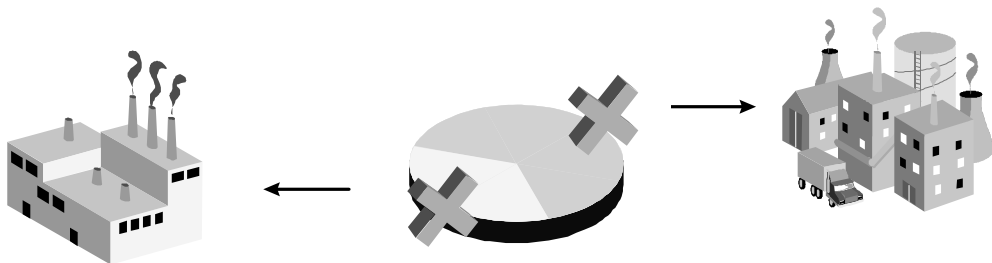
(N) Supply Chain Planning—>Sourcing—>Bill of Distribution

When material flows through three or more organizations, bills of distribution describe supply chain links more efficiently than do sourcing rules.

The figure shows one bill of distribution that involves at least the three receiving organizations; M1, M2, and D2, displayed in the Receiving Organization region of the form. The Org D2 row is selected in the Receiving Organization region. The information displayed in the Shipping Organization region of the form is in reference to the D2 row. The Shipping Organization Rank 1 and Allocation 100% values specify that all of the demand from D2 will be transferred from organization M1. The shipping method is air, and the transportation lead time is two days. When the capacity of M1 is depleted, all excess demand will be transferred from M2 (Rank 2 Allocation 100%).

Allocation Rules

- **The total allocation percentage for all sources within a rank must be 100%**
- **CBP sources with the highest rank have the highest priority in allocation**
- **Optimization sources with the lowest penalty adjusted cost have the highest priority in allocation**



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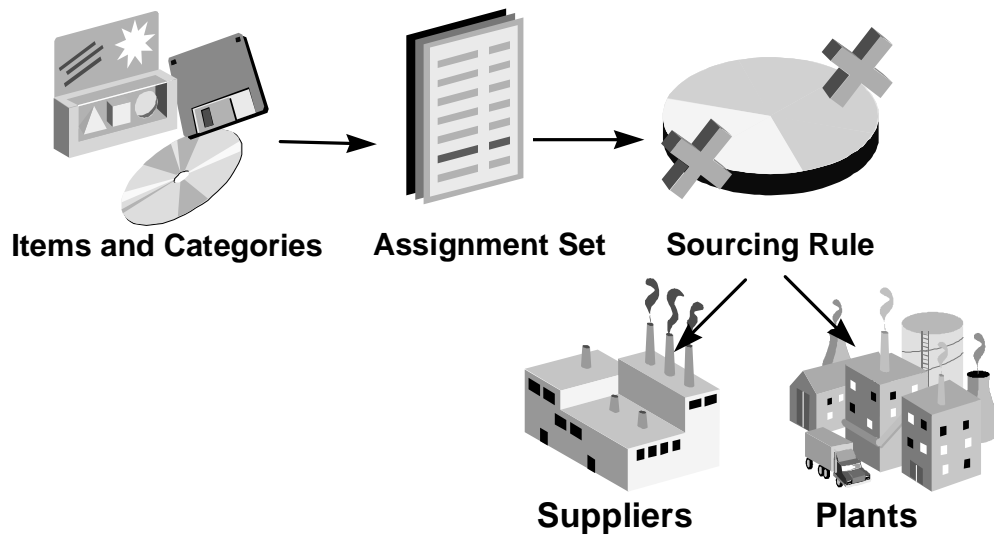
Allocation Rules

Allocation rules have changes with release 11i:

- The total allocation percentage for all sources within a rank must add up to 100 percent.
- In constraint-based planning, rank is used to prioritize sets of sources. The planning engine allocates planned orders to sources of higher preference first. When two or more sources share the same rank, each planned order is split among the sources according to their respective allocation percentages. Sources with the highest rank (lowest numerical value) have the highest priority in allocation. When sources of the highest rank are filled to capacity, allocation begins for sources of the next highest rank.
- In optimized planning, cost is used to prioritize sources. The source of supply is selected on the basis of lowest cost. For example, a second rank (alternative) supplier will be chosen before a first rank (primary) supplier when the cost for using the alternative supplier is lower. This evaluation includes the cost penalties you set up for using the alternative suppliers. When the lowest cost supplier's capacity is exhausted, the demand is allocated to the next-lowest-cost supplier.

Assignment Sets

Assignment sets associate items with sourcing rules and bills of distribution



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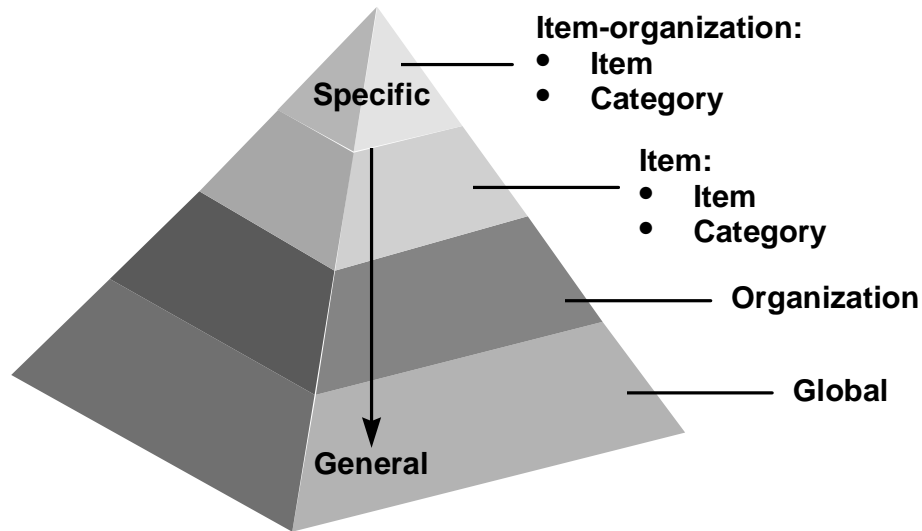
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Assignment Sets

The supply chain for different products varies. Items are associated with their sourcing rules and bills of distribution in an assignment set. In effect, the assignment set creates the sourcing and transfer links between organizations for each item involved in a supply chain plan. Alternative supply chains can be modeled by creating alternative assignment sets.

You must specify an assignment set when launching the planning process. The assignment set to be used while generating a named supply chain plan is specified in the planning options for that supply chain plan name. You can name and create several alternative supply chain plans and then use the Planner WorkBench to compare key performance indicators resulting from your alternative plans. Refer to the lesson titled “ASCP Planner Workbench.”

Sourcing Assignment Hierarchy



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Sourcing Assignment Hierarchy

The planning process uses a sourcing assignment hierarchy to determine the actual source of a specific item. You can assign replenishment sources at the following four levels. The levels are listed from specific to general. Specific sourcing assignments supersede assignments levels that are lower in the hierarchy.

Assigned To	Item/Category	Application
Item-Organization	Item	Applies to a specific item in one organization
Item-Organization	Category	Applies to all items in an item category in one organization
Item	Item	Applies to a specific item in all organizations
Item	Category	Applies to all items in an item category in all organizations
Organization	n/a	Applies to all items in one organization
Global	n/a	Applies to all items in all organizations

Assignment Sets

Assigned To	Item / Category	Description	Type	Sourcing Rule / BoD
Item	AS41001	PDA - Palmate	Bill of Distribut	SCP-DC
Item-Organization	SB41202	Electronic assembl	Sourcing Rule	S1-M1
Item-Organization	SB41202	Electronic assembl	Sourcing Rule	S1-M2
Item-Organization	CM41102	Stylus	Sourcing Rule	RM-M1
Item-Organization	CM41201	LCD display, 11cm	Sourcing Rule	RM-M1
Item-Organization	CM86234	PACKAGING	Sourcing Rule	RM-M1
Item-Organization	CM41102	Stylus	Sourcing Rule	RM-M2
Item-Organization	CM41201	LCD display, 11cm	Sourcing Rule	RM-M2
Item-Organization	CM86234	PACKAGING	Sourcing Rule	RM-M2
Item-Organization	CM41301	2 MB Ram	Sourcing Rule	RM-S1

Purge Copy from... View Sourcing Rule/BOD View Supply Chain Bill

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Sourcing Rule / Bill of Distribution Assignments

(N) Supply Chain Planning—>Sourcing—>Assign Sourcing Rule/BOD

Assignment Sets

The figure shows the Sourcing Rule / Bill of Distribution Assignments window, where an assignment set named ASCP has been set up. When this assignment set is specified in a named MRP plan, the planning engine will plan for finished goods item AS41001 to be replenished according to the bill of distribution named SCP-DC. Item-organization-specific demand for the subassembly SB41202 will be supplied according to sourcing rule S1-M1 or S1-M2, depending on which organization requires the subassembly. (The organization column is not displayed in the figure.) The purchased item CM41102 will be planned to be replenished from the source specified in the sourcing rule named RM-M1.

Located at the bottom of the window are buttons that you can use to view the applicable sourcing rule, bill of distribution, or supply chain bill for the row highlighted in the Assignments region.

View Sourcing Rule

View Sourcing Rule (M1)

Name: **S1-M1** ☐ All Orgs ☒ Planning Active

Description: **Transfer from Chicago or make at Seattle** ☐ Org **M1** Copy From...

Effective Date

From Date: **16/APR/2001** To Date: []

Shipping Organization

Type	Org	Supplier	Supplier Site	Allocation % Rank	Shipping Method	Intransit Time
Transfer From	S1			100 1		
Make At	M1			100 2		

View Purge Copy Shipping Orgs From... Assignment Set...

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View Sourcing Rule

(N) Supply Chain Planning—>Sourcing—>Assign Sourcing Rule/BOD

(B) View Sourcing Rule/BOD

Viewing the Assigned Sourcing Rule

From the Sourcing Rule / Bill of Distribution Assignments window, click the View Sourcing Rule/BOD button to display the assigned sourcing rule or bill of distribution. In the figure, the sourcing rule named S1-M1 calls for items to be transferred from organization S1 (Chicago). However, if Chicago is unable to supply the item, it will be manufactured at organization M1 (Seattle).

View Supply Chain Bill

Assignment Set	ASCP	Assignment set for ASCP
Organization	M1	Seattle Manufacturing
Item	AS41001	PDA - Palmate
Date	28/APR/2001	

View Indented Where Used View Indented Bill View Sourcing Hierarchy

View Supply Chain Bill

(N) Supply Chain Planning—>Sourcing—>Assign Sourcing Rule/BOD (B) View Supply Chain Bill

Viewing Supply Chain Information

With a row highlighted in the Assignment region in the Sourcing Rule / Bill of Distribution Assignments window click the View Supply Chain Bill button to open the View Supply Chain Bill window. From this window you can click the appropriate button to view the following information related to the highlighted row on the Sourcing Rule / Bill of Distribution Assignments window:

- Indented where-used information
- Indented bill of material information
- Sourcing hierarchy

View Sourcing Assignment Hierarchy

View Sourcing Assignment Hierarchy

Org: **M1** Item: **AS41001** PDA - Palmate

Assignment Set: **ASCP** Assignment set for ASCP

Sourcing Rules Assignment Hierarchy

Active Rule	Assigned To	Type	Sourcing Rule/Bill Of Distribution	Description	Source Org
<input type="checkbox"/>	Item-Org	Sourcing Rule			
<input type="checkbox"/>	Item-Org	Source Org			
<input type="checkbox"/>	Item Category-Org	Sourcing Rule			
<input checked="" type="checkbox"/>	Item	Bill Of Distribution	SCP-DC	Supply Chain BOD to Dis	
<input type="checkbox"/>	Item	Sourcing Rule			
<input type="checkbox"/>	Item Category	Bill Of Distribution			
<input type="checkbox"/>	Item Category	Sourcing Rule			
<input type="checkbox"/>	Organization	Sourcing Rule			
<input type="checkbox"/>	Organization	Source Org			
<input type="checkbox"/>	Global	Bill Of Distribution			
<input type="checkbox"/>	Global	Sourcing Rule			

View BOD/Sourcing Rule

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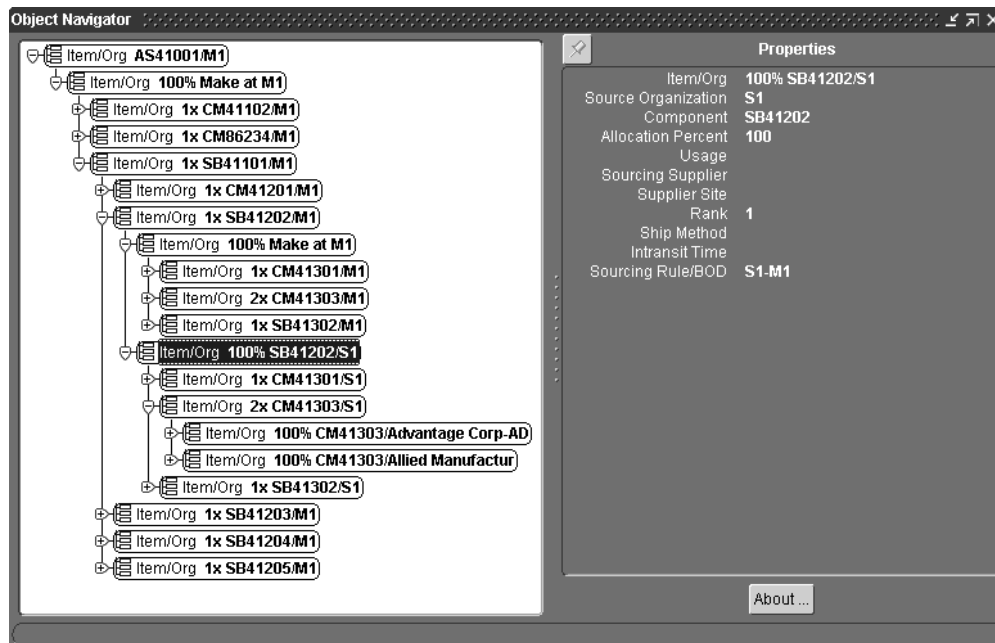
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View Sourcing Assignment Hierarchy

(N) Supply Chain Planning—>Sourcing—>Assign Sourcing Rule/BOD (B) View Supply Chain Bill
(B) View Sourcing Hierarchy

You can use this form to view the sourcing rule assignment hierarchy. In the figure, the check box indicates that item AS41001 has an active rule at the item level. It is a bill of distribution named SCP-DC.

View Indented Supply Chain Bill



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Object Navigator

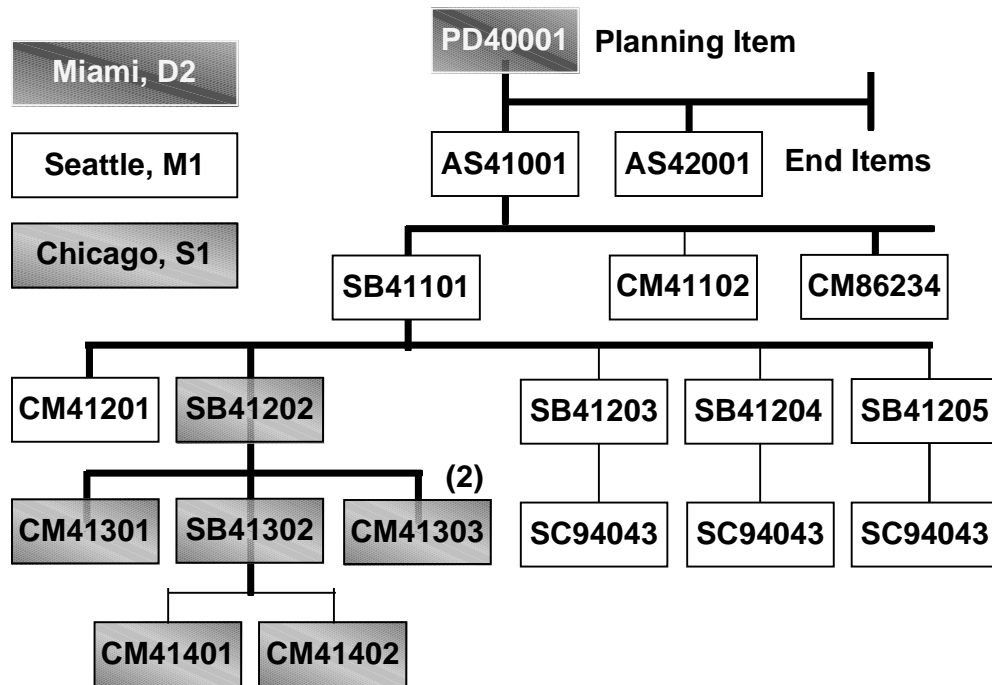
(N) Supply Chain Planning—>Sourcing—>Assign Sourcing Rule/BOD (B) View Supply Chain Bill
(B) View Indented Bill

View Indented Bill

In the View Supply Chain Bill window, click the View Indented Bill button to launch the Object Navigator. Click the plus (+) signs to open the tree.

- In the figure, item AS41001 is made at M1, Seattle.
- Components are purchased items CM41102, CM86234, and subassembly SB41101.
- Open the subassembly; the Object Navigator shows SB41101 is made in organization M1 from purchased item CM41201 and subassemblies SB41202, SB41203, SB41204, and SB41205.
- Open the subassembly SB41202; the display shows that the subassembly can be made at M1, Seattle, or transferred from S1, Chicago.
- Select the Chicago source; the Properties window shows the rank is 1. Not shown is that the Seattle source is rank 2. Therefore, Chicago is the primary source. In Chicago, subassembly SB41202 has purchased components CM41301 and CM41303 and subassembly SB41302 manufactured in Chicago.
- Open the purchased component CM41303; the Object Navigator shows two suppliers: Advantage and Allied. When the supplier node is highlighted, the Properties window shows sourcing rule and supplier rank information for this supplier-item.

Organization Assignment



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Assigned Items

Not every item in a bill of material needs to be listed in the assignment set. For example in the figure, the purchased items CM41301, CM41303, CM41401, and CM41402 are listed in an assignment set because a sourcing rule connects the supplier to the Chicago manufacturing plant where these items are consumed. Item SB41202 is an example of an item that is transferred between manufacturing plants. A bill of distribution directs that transfer, so item SB41202 appears in the assignment set as well.

SB41302 and SB41101 are examples of items that need not be assigned because these subassemblies are manufactured and then consumed within one organization. There is no need for a sourcing rule or bill of distribution to create an interorganization link covering those items.

Flexfield Setup

- **Flexfields enable the capture of APS-specific parameters in pre 11i instances**
- **Handling exceptions**
- **Data that must be set up for an APS instance (not captured by the pre-11i source)**
 - **Supplier capacity by item and organization**
 - **Sourcing rules based on 11i enhancements**

Flexfields

Modeling certain characteristics of a supply chain may require use of flexfields for release 10.7 or 11 transactional instances to capture specific parameters. The ASCP Optimization option requires more information and is more likely to require the use of flexfields. Patches are provided to set up pre-11i instance flexfields for APS use.

Exceptions

The penalty cost factor for exceeding transportation capacity at the shipping method level cannot be modeled when the transaction source is release 10.7 or 11 because capacity fields are not available on the Inter-Location Transit Time form and because the supplier site cannot be associated with a location.

APS Setup

When the source instance is pre-11i, there are not enough flexfields on the source to capture information such as:

- Supplier capacity by item
- Updated sourcing rule and BOD allocation and ranking procedures provided with release 11i

However, you can achieve this functionality by modeling this information on the APS side, which is at the release 11i level.

Details on flexfield setup are provided in the *ASCP/Global ATP Users Guide*.

Summary

In this lesson, you should have learned how to:

- **Set up supply chain relationships in transaction instances**
- **Discuss the use of flexfields to accommodate APS-specific data**

Summary

Supply chain modeling requires set up in inventory, engineering, purchasing, and supply chain planning modules. Some new fields in the organization parameters and approved supplier list are used to model constraints. The ASCP system uses setup information from the transaction systems. There is no need to perform redundant setup to use ASCP.

The summary lists transaction system setup that is especially important to ASCP.

Practice 4-1 Overview

This practice covers completing Part II of the APS case study:

- **Defining the approved supplier list**
- **Defining pricing**
- **Defining sourcing rules and bills of distribution**
- **Defining the assignment set**

Performing Practice 4 - 1

For detailed instructions on performing this practice, see Part II in Appendix B, “Case Study.”

5

Creating and Loading the Master Demand Schedule

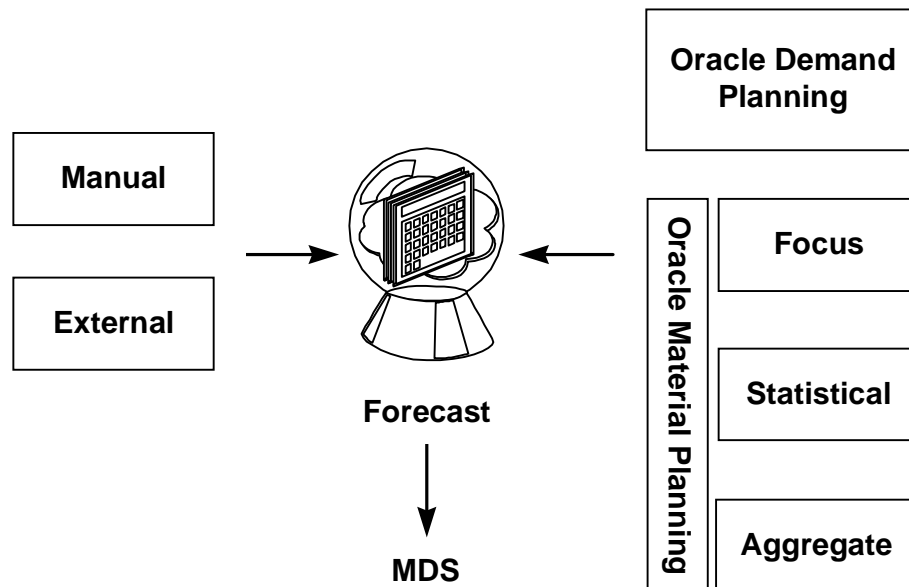
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Objectives

After completing this lesson, you should be able to do the following:

- **Describe forecasts, sets, methods, and levels**
- **Create and load forecasts**
- **Describe master demand schedules**
- **Create and load master demand schedules**

Forecasting Alternatives



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Forecast Methods

You can use any of the following forecasting alternatives to develop and maintain item forecasts:

- **Manual:** You directly enter the information into the Forecast Item Entries form.
- **External:** You develop forecasts using another software system and bring the information into Oracle material planning using the concurrent process Open Forecast Interface.
- **Focus:** Oracle material planning uses a process explained in the book, *Focus Forecasting* by Bernard T. Smith, c 1984 Bernard T. Smith, published by Oliver Wight Limited Publications, Inc. Essex Junction, VT to determine which of five methods to use in calculating a forecast for each item.
- **Statistical:** Oracle material planning calculates forecasts for items using the exponential smoothing mathematical technique with trend and season enhancement.
- **Aggregate:** Oracle material planning uses a bill of material explosion process to calculate component item requirements based on a forecast for the parent assembly.
- **Oracle Demand Planning:** This is a product within the Advanced Planning and Scheduling suite. It relies on Internet collaboration to obtain forecast information from many sources. Oracle Demand Planning provides functionality to coordinate, calculate, consolidate, analyze, adjust, and allocate forecasts. Refer to the lesson titled “Oracle Demand Planning.”

Note: When you use Oracle Demand Planning, much of the functionality described in this lesson, such as forecast sets and levels, is replaced by another approach. Regardless of the method used, the statement of demand entered the planning system is in the form of a master demand schedule.

Oracle Material Planning Forecasts

WESTERN Regional forecast

<u>Item</u>	<u>Date</u>	<u>Qty</u>	<u>Source</u>
A	6/1	25	Western

CENTRAL Regional forecast

<u>Item</u>	<u>Date</u>	<u>Qty</u>	<u>Source</u>
A	6/1	50	Central

EASTERN Regional forecast

<u>Item</u>	<u>Date</u>	<u>Qty</u>	<u>Source</u>
A	6/1	10	Eastern

Oracle Material Planning Forecasts

Make-to-stock, configure-to-order, and make-to-order businesses often use forecasts in their planning process. Forecasts are a statement of future customer orders that you expect to receive, while sales order backlog represents customer orders that you have already received, but not yet shipped.

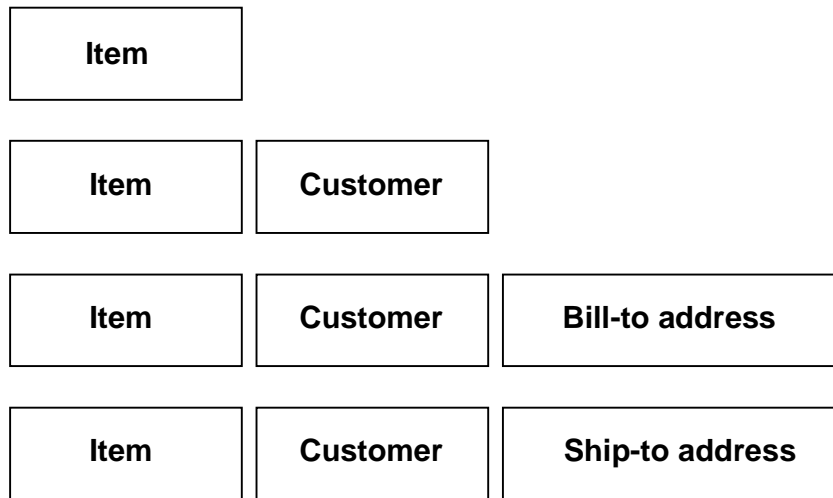
Oracle Material Planning forecasts contain the following elements:

- Item numbers
- Dates
- Original quantities
- Current quantities

Original quantities are expected shipments of goods due to customer orders that you expect to receive.

Current quantities are expected shipments of goods due to customer orders that you expect to receive less (net of) expected shipments of goods due to customer orders that you have already received. The process of calculating current quantities from original quantities is called forecast consumption. See “Forecast Consumption” later in this lesson.

Forecast Levels



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Forecast Levels

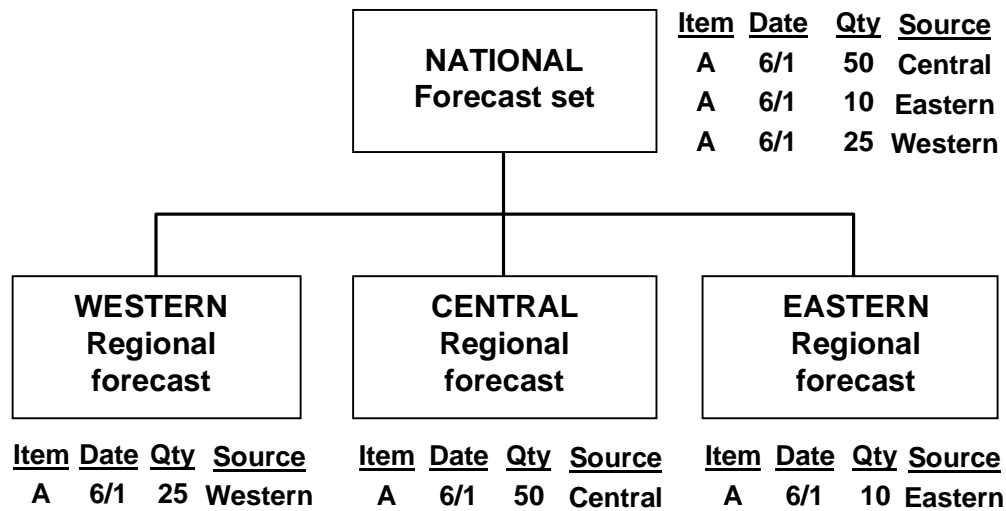
With Oracle Material Planning, you use forecast levels to specify the level of detail of the forecast entries. In the figure, the four available forecast levels are shown in order of increasing detail. For example, a forecast by item and by customer is more specific and detailed than is a forecast by item only.

Choose one of the following levels of detail and assign it to each forecast set:

- To provide date, quantity, and item, use forecast level Item.
- To provide date, quantity, item, and customer, use forecast level Customer.
- To provide date, quantity, item, customer, and bill-to address, use forecast level Bill-To.
- To provide date, quantity, item, customer, and ship-to address, use forecast level Ship-To.

To use Customer, Bill-To, or Ship-To, you must be using either Oracle Receivables or Oracle Order Entry.

Forecast Sets



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Forecast Sets

You use forecast sets to group multiple forecasts that logically represent a whole. In the above example, the eastern, central, and western regional forecasts logically represent the national forecast set. Note that each of these forecasts may have multiple item numbers, and that each of these item numbers may have multiple entries.

Forecasts within a set are added together. Therefore, you should not use forecast sets to group alternative methods of forecasting the same entity. For example, you forecast shipments for the eastern region using one method, and your colleague forecasts shipments for the same region using another method. Those two forecasts should not be placed within the same set, because the resulting combined forecast will be about twice what it should be. You should place alternative forecasts in different forecast sets. Then you can use the different forecast sets as input to alternative plan simulations.

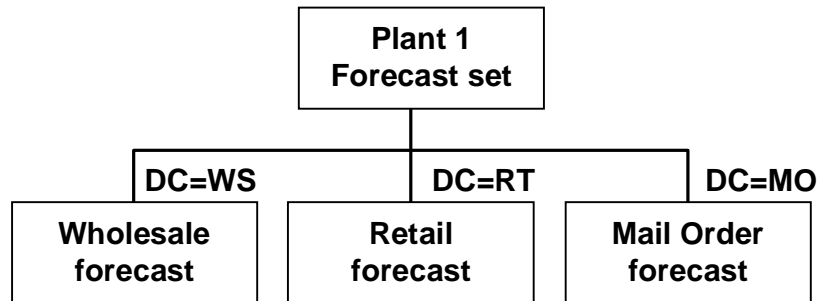
Note: If you have only one forecast, you still must assign it to a forecast set.

Viewing Forecasts

If you view the western regional forecast, you will see all of the forecast entries in the western regional forecast. However, if you view the national forecast set, you will see all of the forecast entries in the eastern, central, and western regional forecasts. The entries are interspersed by date and identified by source forecast.

You may view forecast entries in detail or bucketed by day, week, or month.

Demand Classes



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Demand Classes

You use demand classes to represent any grouping of forecast demand that you might want to consume or load separately. This grouping technique enables you to separate information in one organization into multiple, live forecasts, for example, by one of the following criteria:

- Product line
- Geography

You can assign a demand class to a forecast. Different forecasts within the same forecast set may have different demand classes.

In the above example, the company has three lines of business in one organization: wholesale, retail, and mail order. Each line of business in that one organization is represented by a separate forecast.

If you perform the forecast copy and merge process using a destination forecast with a demand class, the destination forecast entries use the destination forecast demand class, even if the source entries have a different demand class.

Forecast Bucket Types

Bucket Type	Date	End Date	No. of Buckets	Total Qty.	Orig Qty.	Curr. Qty.
Days	Jun 20		1	20	20	20
Days	Jun 20	Jun 30	7	140	20	20
Weeks	Jun 2		1	100	100	100
Weeks	Jun 2	Jun 30	5	500	100	100
Periods	Jun 2		1	400	400	400
Periods	Jun 2	Sep 29	5	2000	400	400

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Forecast Bucket Types

You use forecast bucket types to specify the time period that a forecast entry covers. Choose one of the following time periods and assign it to each forecast entry:

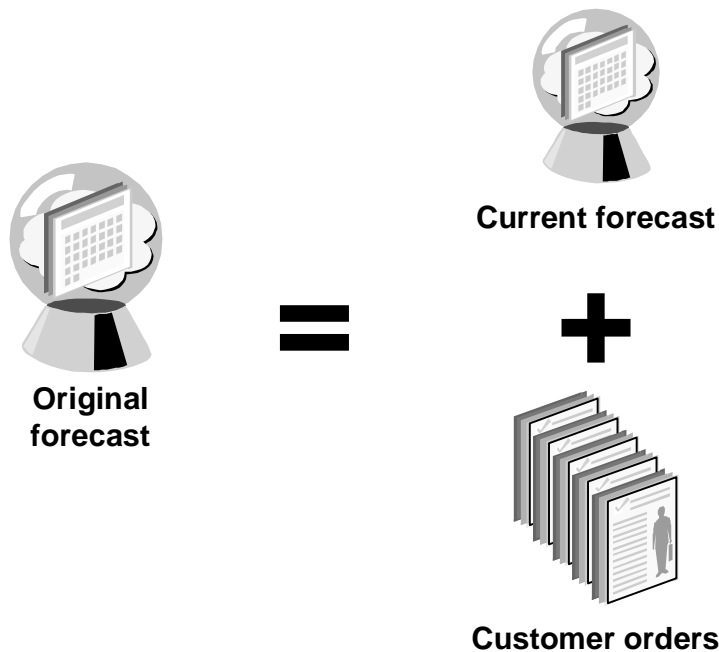
- For a forecast entry of a day, use forecast bucket type Days.
- For a forecast entry of a week, use forecast bucket type Weeks.
- For a forecast entry of a month according to the workday calendar, use forecast bucket type Periods.

An item number can have mixed bucket types. For example, you can specify the current quarter forecast entries in weeks and the remaining forecast entries in periods. The bucket types can also overlap. For example, you can enter a forecast for 500 units in a week, and also enter a daily forecast for 15 units to occur on the Wednesday of that same week. The result is a total forecast of 515 units, with 500 units forecast for the first day of the week, and 15 units on Wednesday.

Notes:

- Oracle Material Planning does not allow entry of quarterly forecasts.
- Oracle Material Planning does not convert forecast entries among bucket types. For example, at no point does it convert a period forecast into four or five weekly forecasts. However, you can perform this function by manually adjusting the forecast entries.

Forecast Consumption



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Forecast Consumption

You use forecast consumption to instruct Oracle material planning to reduce the current quantity of a forecast entry when you create a sales order to ship on the same day as the forecast entry. This allows you to:

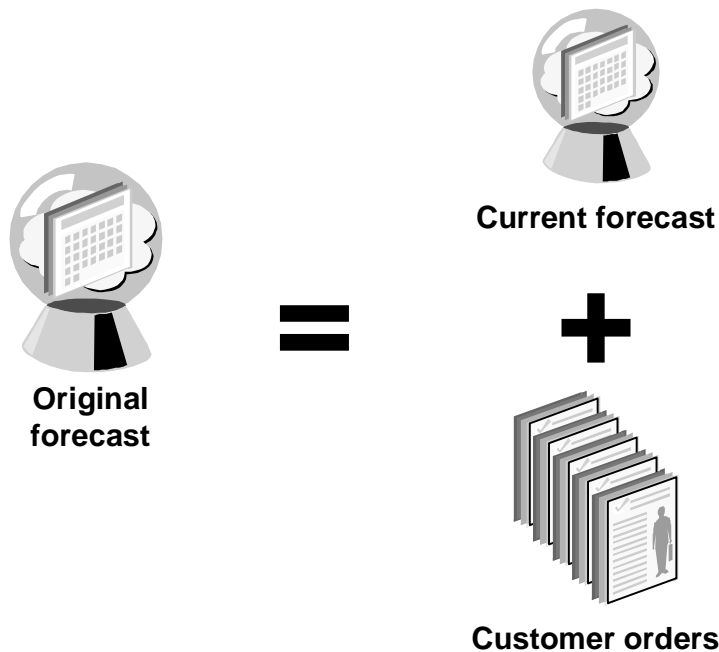
- Separately view the planned (forecast) and actual (sales order) portions of independent demand
- Assess forecast accuracy

You do *not* use forecast consumption to promise sales order ship dates to customers. Use the Oracle Inventory and Oracle Order Entry Available to Promise features.

The forecast consumption process uses the sales order line schedule date to match sales order and forecast dates. The schedule date is the date that you believe you will ship the units to the customer. It is usually the same as the promise date—the date that you promise to the customer that you will ship the units—but it could be recorded as a different date.

For successful forecast consumption, set the item attribute Forecast Control to Consume or Consume and Derive.

Forecast Consumption Terms



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Forecast Consumption Terms

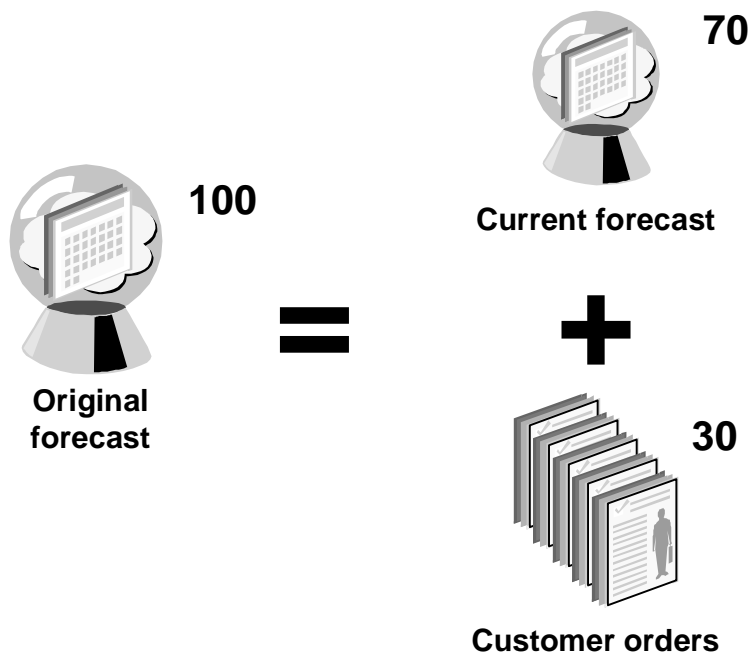
The original forecast states quantities of shipments due to customer orders that you expect to receive. The current forecast states quantities of shipments due to customer orders that you expect to receive, minus shipments due to customer orders that you have already received.

Sometimes you sell fewer units than you forecast; the forecast is optimistic. The current forecast quantity is lower than the original forecast quantity, but not zero. On rare occasions, you may sell exactly the same number of units that you forecast. Actual sales equal the original forecast, and the current forecast is equal to zero.

Sometimes you sell more units than you forecast. The current forecast quantity cannot drop below zero. To record the extra sales order quantity, the forecast consumption process creates an extra forecast entry with the following characteristics:

- The extra forecast entry appears only in the forecast set, *not* in the forecast.
- The source is called overconsumption.
- The original (forecast) quantity is set to zero.
- The current (forecast) quantity is the extra sales order quantity expressed as a negative number.
- The bucket type is Days.
- The date is the sales order line schedule date.

Forecast Consumption Example



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Forecast Consumption Example

The following example illustrates forecast consumption:

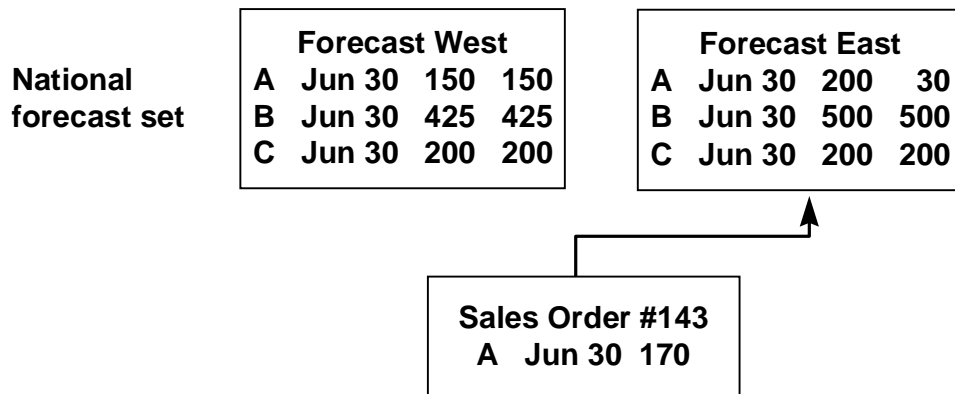
- The original forecast is 100 units:
 - Current forecast is 100 units.
 - Actual sales are 0 units.
- A sales order for 30 units is accepted:
 - Current forecast is 70 units (100 – 30).
 - Actual sales are 30 units.

The total sales for the period are still expected to be 100 units. Thirty units of demand are actual, and an additional 70 units are currently forecast to be demanded by as yet undetermined customers.

Assessing Forecast Accuracy

You can assess forecast accuracy by using forecast consumption original forecast, current forecast, and overconsumption quantity information. Consistent overconsumption indicates pessimistic forecasts. When the current forecast rarely drops to zero, the forecasting method is too optimistic.

Forecast Consumption Rules

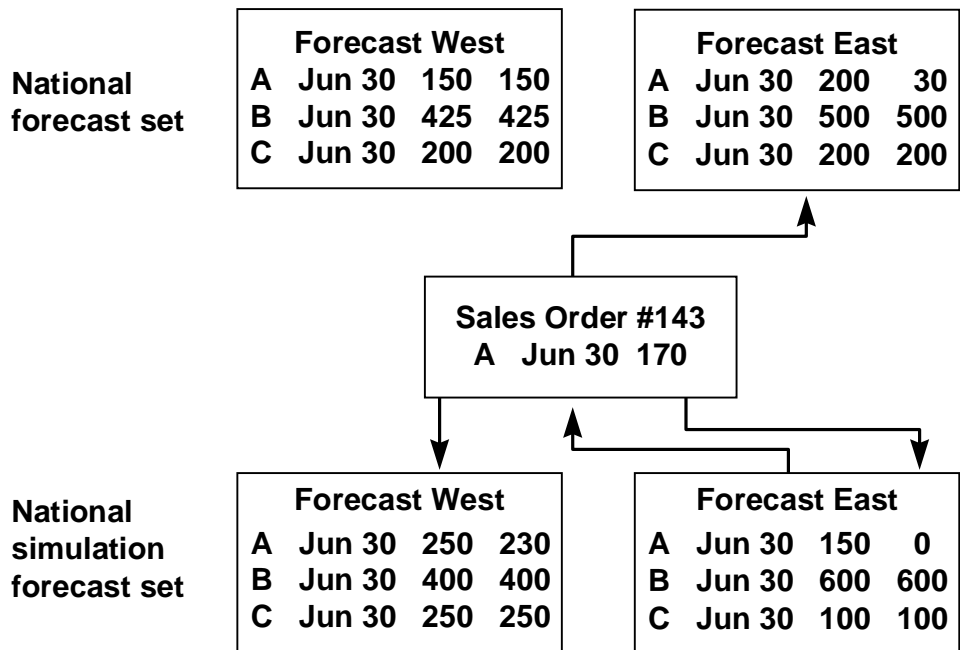


Forecast Consumption Rules

Two important rules govern forecast consumption:

- Forecast consumption occurs once within a forecast set. In the above example, you have developed an eastern and a western forecast in anticipation of sales orders.
 - The forecast consumption process consumes the 170 units from one of the forecasts in the forecast set, *not* both.
 - If the sales order quantity is 350, the process consumes 200 from the eastern forecast and then 150 from the western forecast (*not* 350 from each forecast).
- The process consumes from the eastern forecast first because it consumes forecasts within a forecast set in alphanumeric order (which you can override with the demand class feature).

Forecast Consumption Rules



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Forecast Consumption Rules (continued)

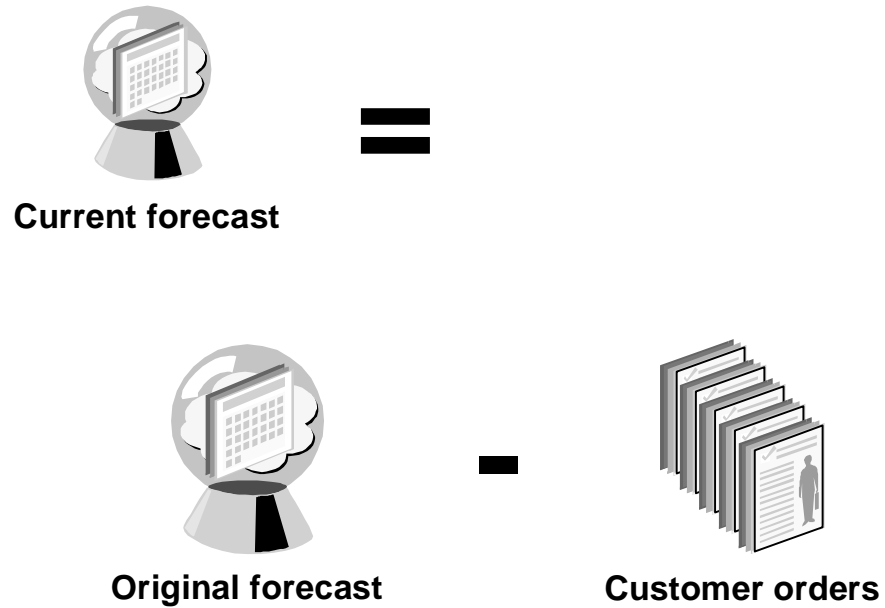
- Forecast consumption can occur simultaneously in multiple forecast sets. In the above example, you have developed two eastern forecasts in anticipation of the same sales orders and two western forecasts in anticipation of the same sales orders. However, you have used different techniques to develop each forecast set. You will compare the accuracy of the two methods to determine the better technique.

Since the two eastern forecasts and the two western forecasts anticipate the same sales orders, they are not multiple forecasts that logically represent a whole. You cannot place them in the same forecast set. Place the two active forecasts in one forecast set and the two simulation forecasts in another forecast set.

The forecast consumption process:

- Consumes 170 units from the eastern forecast in the active forecast set
- Consumes 150 units from the eastern forecast and then 20 units from the western forecast in the simulation forecast set

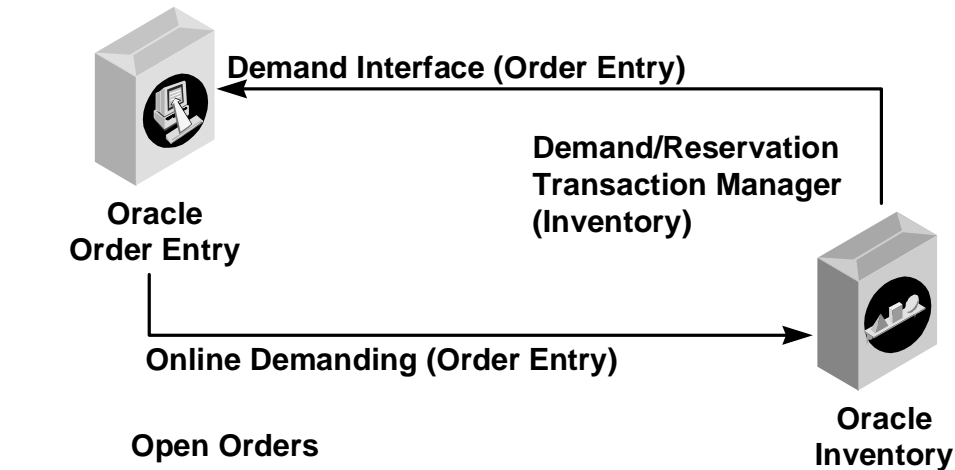
Forecast Consumption



Instructing Oracle Master Schedule/MRP to Perform Forecast Consumption

1. Set the Personal Profile option MRP: Consume Forecast to Yes.
2. Choose Consume for each desired forecast set.

Demanding



Open Orders			
<u>Order</u>	<u>Item</u>	<u>Date</u>	<u>Qty.</u>
1432	A	6/1	10

Supply/Demand

<u>Order</u>	<u>Item</u>	<u>Date</u>	<u>Qty.</u>
1432.Standard.ORDER ENTRY	A	6/1	-10

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The Demanding Process in Forecast Consumption

Most manufacturing processes in Oracle Applications do not interact directly with Oracle Order Entry; they use sales order information in the supply and demand portion of Oracle Inventory. You use the demanding process to create sales order information in the supply and demand portion of Oracle Inventory.

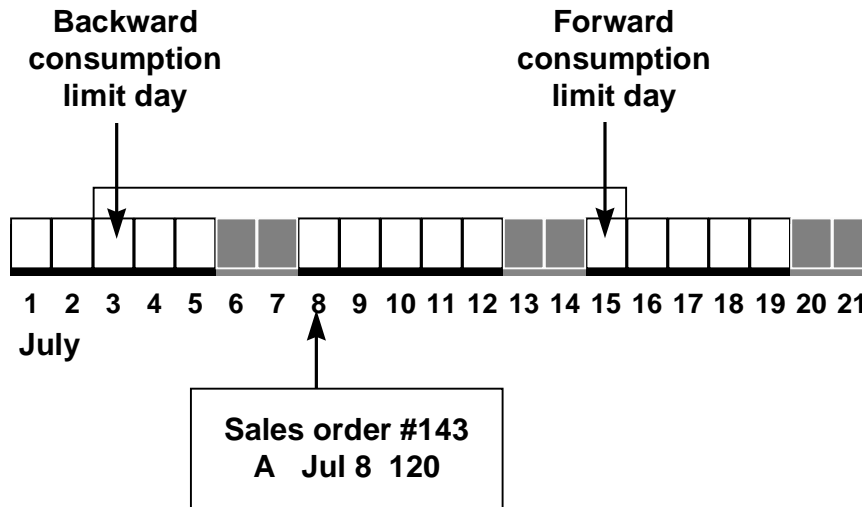
Performing the Demanding Process

When you enter a sales order using Oracle Order Entry, only Oracle Order Entry knows about the sales order. You execute one of the following processes to create a reference to the sales order in the Oracle Inventory supply and demand information (this action triggers forecast consumption):

- The Oracle Order Entry concurrent process Demand Interface, which passes information to the Oracle Inventory concurrent process Demand/Reservation Transaction Manager
- The Oracle Order Entry online process Online Demanding

Note that there is another Oracle Order Entry process known as *reserving*. Reserving locks on-hand inventory (*not* planned inventory) for the sales order, placing the reservation so that you do not use it for any other sales order. When you reserve a sales order line, you also have demanded it.

Consumption Days



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Consumption Days in Forecast Consumption

You use backward and forward consumption days in forecast consumption because customers do not always request ship dates that exactly match your forecast dates. For example:

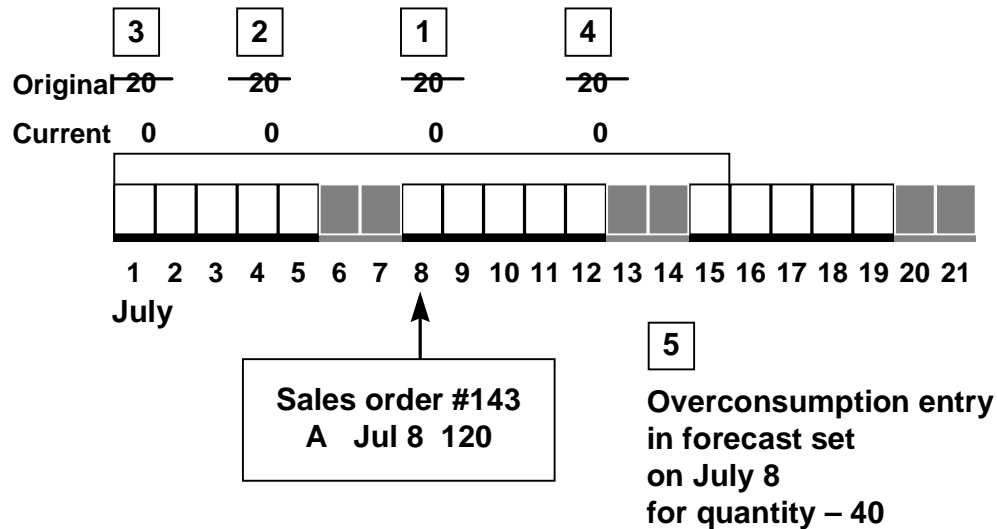
- Your weekly forecast entries are for quantity 100 for this week and quantity 100 for next week. All of this week's forecast quantity has been consumed, and you receive another sales order for shipment this week. You may feel that customers ordered earlier than expected, and that some of the forecast quantity that you planned next week was in anticipation of sales orders that you actually promise to ship this week.
- Your periodic forecast entries are for quantity 500 for this month and quantity 500 for next month. All of next month's forecast quantity has been consumed, and you receive another sales order for shipment next month. You may feel that customers ordered later than expected, and that some of the forecast quantity that you planned this month was in anticipation of sales orders that you actually promise to ship next month.

When you set backward and forward consumption days, you create a window around the sales order line schedule date. The sale will consume forecasts falling within the window. The boundary days of the window are the Backward Days and Forward Days values you enter on the Forecast Sets window.

Forecast Consumption: Days

Backward consumption days = 5 from day 8 (days 5, 4, 3, 2, 1)

Forward consumption days = 5 from day 8 (days 9, 10, 11, 12, 15)



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The Forecast Consumption Process with Daily Bucket Types

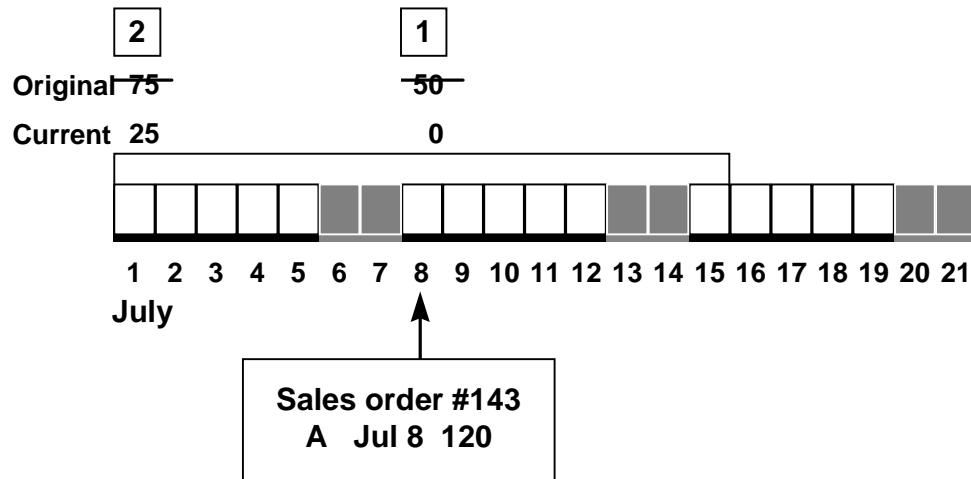
Oracle Applications uses the following process to perform forecast consumption for daily bucket types:

1. The Oracle material planning periodic concurrent process Planning Manager detects the creation of the sales order from the demanding process.
2. The Planning Manager checks for a forecast entry for the item on the sales order line schedule date. If it finds any, it lowers the quantity and notes sales order information in the forecast (*reduces the entry*).
3. If the Planning Manager does not find entries whose quantity covers the sales order quantity, it reduces other forecast entries as follows:
 - If you have assigned backward consumption days, it proceeds backward from the sales order line schedule date to the backward consumption limit day, reducing entries that occur during those days.
 - If you have assigned forward consumption days, it proceeds forward from the sales order line schedule date to the forward consumption limit day, reducing entries that occur during those days.
 - If it has not completely reduced the sales order quantity, it creates an overconsumption entry.

Forecast Consumption: Weeks

Backward consumption days = 1 from day 8 (day 5)

Forward consumption days = 0 from day 8



The Forecast Consumption Process with Weekly Bucket Types

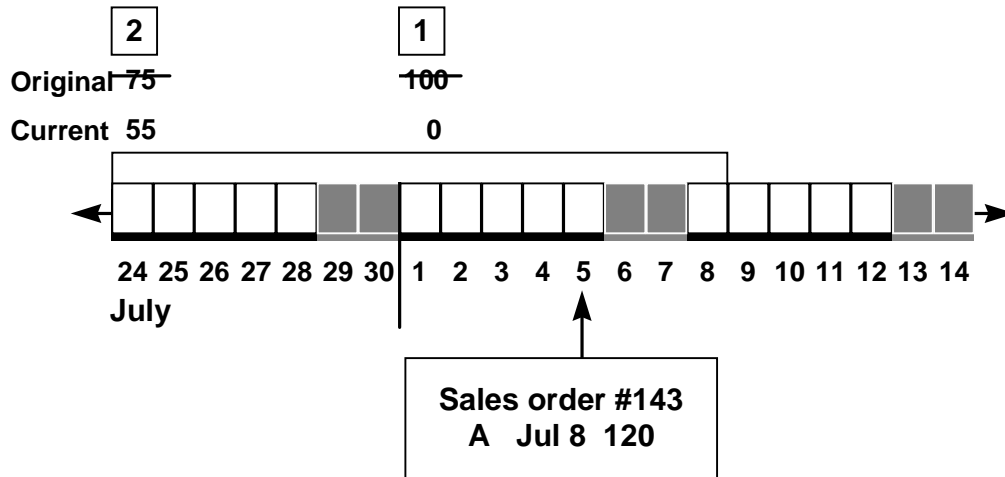
Oracle Applications uses the following process to perform forecast consumption for weekly bucket types:

1. The Oracle material planning periodic concurrent process Planning Manager detects the creation of the sales order from the demanding process.
2. The Planning Manager checks for a forecast entry for the item in the week that contains the sales order line schedule date, even if the the forecast entry is not on the sales order line schedule date. If it finds any, it lowers the quantity and notes sales order information in the forecast (*reduces the entry*).
3. If the Planning Manager does not find entries whose quantity covers the sales order quantity, it reduces other forecast entries as follows:
 - If you have assigned backward consumption days, it proceeds backward from the sales order line schedule date to the backward consumption limit day, reducing entries that occur during those days and entries that occur in the same week as the backward consumption limit day.
 - If you have assigned forward consumption days, it proceeds forward from the sales order line schedule date to the forward consumption limit day, reducing entries that occur during those days and entries that occur in the same week as the forward consumption limit day.
 - If it has not completely reduced the sales order quantity, it creates an overconsumption entry.

Forecast Consumption: Periods

Backward consumption days = 10 from day 5 (days 4, 3, 2, 1, 28, 27, 26, 25, 24, 21)

Forward consumption days = 10 from day 5 (days 8, 9, 10, 11, 12, 15, 16, 17, 18, 19)

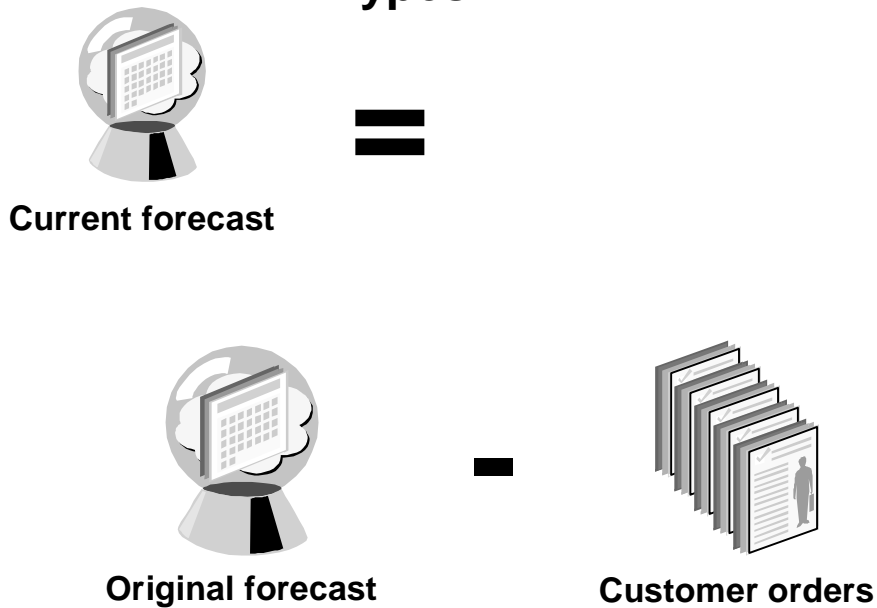


The Forecast Consumption Process with Periodic Bucket Types

Oracle Applications uses the following process to perform forecast consumption for periodic bucket types:

1. The Oracle material planning periodic concurrent process Planning Manager detects the creation of the sales order from the demanding process.
2. The Planning Manager checks for a forecast entry for the item in the period that contains the sales order line schedule date, even if the the forecast entry is not on the sales order line schedule date. If it finds any, it lowers the quantity and notes sales order information in the forecast (*reduces the entry*).
3. If the Planning Manager does not find entries whose quantity covers the sales order quantity, it reduces other forecast entries as follows:
 - If you have assigned backward consumption days, it proceeds backward from the sales order line schedule date to the backward consumption limit day, reducing entries that occur during those days and entries that occur in the same period as the backward consumption limit day.
 - If you have assigned forward consumption days, it proceeds forward from the sales order line schedule date to the forward consumption limit day, reducing entries that occur during those days and entries that occur in the same period as the forward consumption limit day.
 - If it has not completely reduced the sales order quantity, it creates an overconsumption entry.

Forecast Consumption: Multiple Bucket Types



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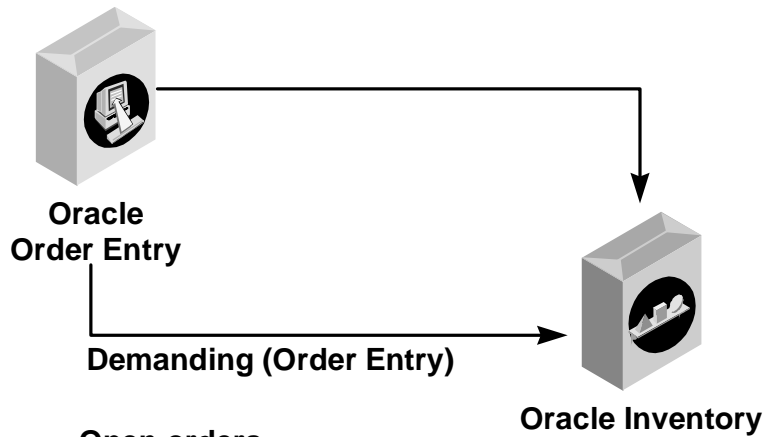
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The Forecast Consumption Process with Multiple Bucket Types

If you have a combination of daily, weekly, and periodic forecasts for one item, the Planning Manager consumes forecast entries according to the following procedure:

- It consumes those entries on the sales order line schedule date (or within the same week or period) as follows:
 - Daily forecast entries first
 - Weekly forecast entries next
 - Periodic forecast entries last
- It consumes those entries on backward consumption days (or within the same week or period) as follows:
 - Daily forecast entries first
 - Weekly forecast entries next
 - Periodic forecast entries last
- It consumes those entries on forward consumption days (or within the same week or period) as follows:
 - Daily forecast entries first
 - Weekly forecast entries next
 - Periodic forecast entries last

Undemanding



Open orders

<u>Order</u>	<u>Item</u>	<u>Date</u>	<u>Qty</u>
1432	A	6/1	10

Supply/Demand

<u>Order</u>	<u>Item</u>	<u>Date</u>	<u>Qty.</u>
1432.Standard.ORDER ENTRY	A	6/1	-10

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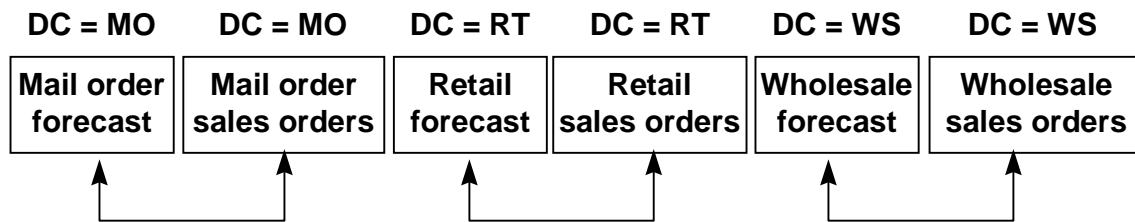
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Forecast Consumption with Changed and Canceled Sales Orders

If you change or cancel a sales order, use the following process to coordinate with forecast consumption:

- Use the Oracle Order Entry order entry forms to undemand the sales order line. This process removes sales order information in the supply and demand portion of Oracle Inventory. Note that you may not change or cancel a demanded sales order line without undemanding it.
- The Oracle material planning periodic concurrent process Planning Manager reverses forecast consumption to increase the current quantity of forecast entries previously consumed by the sales order that you have undemanded.
- Use Oracle Order Entry order entry forms to change or cancel the sales order line.
- If you changed the sales order line, demand the sales order line using the Oracle Order Entry forms.
- Oracle material planning consumes forecast entries from the sales order.

Demand Classes



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The Forecast Consumption Process with Demand Classes

You use demand classes to represent any grouping of forecast demand that you might want to consume or load separately. Using this grouping technique enables you to separate information in one organization into multiple, live forecasts, for example, by one of the following criteria:

- Product line
- Geography

You may assign a demand class to a forecast. Different forecasts within the same forecast set may have different demand classes.

In the above example, the company has three lines of business in one organization: wholesale, retail, and mail order. You can do either of the following:

- Create one forecast set, represent each line of business in that one organization by a separate forecast in that forecast set, and assign each forecast a different demand class.
- Create three forecast sets, represent each line of business in that one organization by a forecast in one of the forecast sets, and assign each forecast a different demand class.

If you perform the forecast consumption process using demand classes, you stop the forecast consumption process from consuming forecasts in a forecast set in alphanumeric order.

Forecast Control

None

Consume

Consume and Derive

Forecast Control

You use the item attribute Forecast Control to control the forecast explosion and consumption processes.

The forecast explosion process is used in two situations:

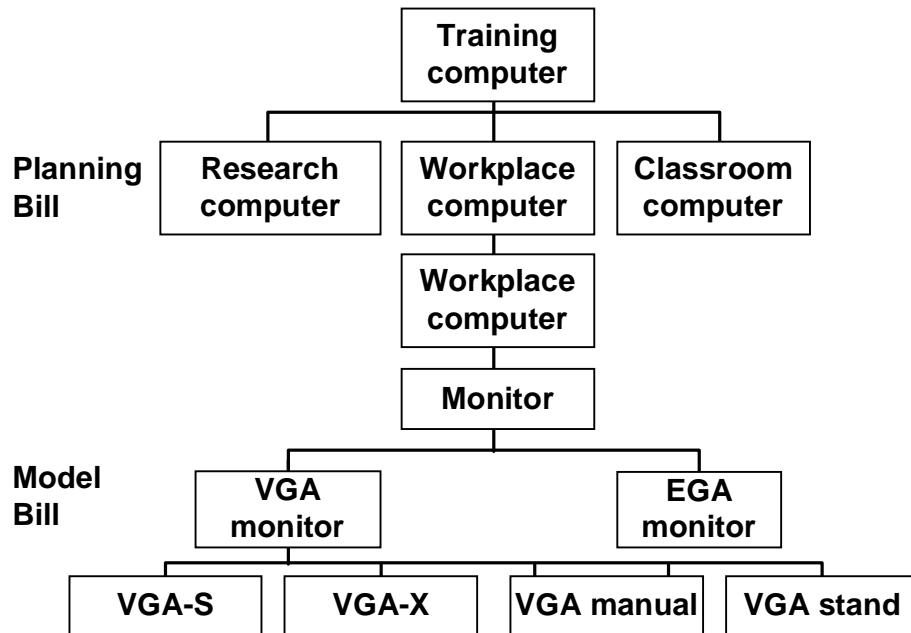
- A planning bill of material guides the calculation of demand for product family members based upon a forecast for the parent product family item.
- A model bill of material guides the calculation of demand for modular options based upon a forecast for an assemble-to-order end item.

The forecast consumption process is used to prevent double counting of demand when both a forecast and a backlog of sales orders exist for the same item in the same time period. As sales orders are received, the forecast is decreased by an equal quantity. Using the forecast consumption technique, for a particular time period, the sum of the two types of demand—forecasts and sales orders—does not change as additional sales orders are entered over time. Only when the backlog of sales orders for a period exceeds the forecast will the planning system increase the planned source of supply.

For each item, you select one of the following choices:

- **None:** The item is not subject to either forecast explosion or forecast consumption.
- **Consume:** The item is subject to forecast consumption, but is not subject to forecast explosion.
- **Consume and derive:** The item is subject to both forecast explosion and forecast consumption.

Aggregate Forecasting



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Aggregate Forecasting

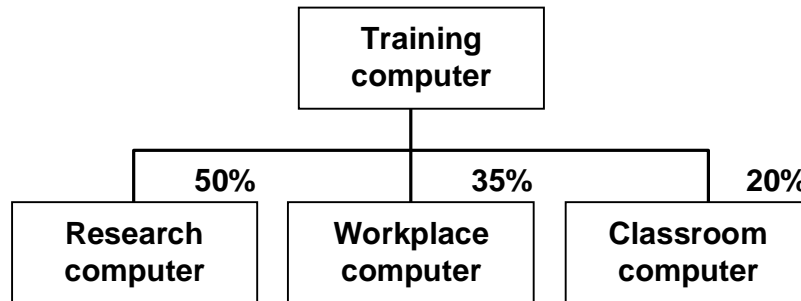
You use aggregate forecasting to consume forecasts for component items from sales orders of their assemblies. Aggregate forecasting is not a statistical forecasting method based on demand history for the items. Instead, the aggregate forecast calculation works like a bill of material explosion.

Aggregate forecasting works with two types of bills of material:

- Planning
- Model

The forecast consumption process works with planning bills of material and model bills of material as described next.

Planning Bills of Material



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Planning Bills

Planning bills of material are used by Oracle material planning for forecast explosion. They have the following characteristics:

- Their parent assembly has a BOM Item Type item attribute of Planning.
- Their components have BOM Item Type item attributes of Standard, Model, or Option Class.

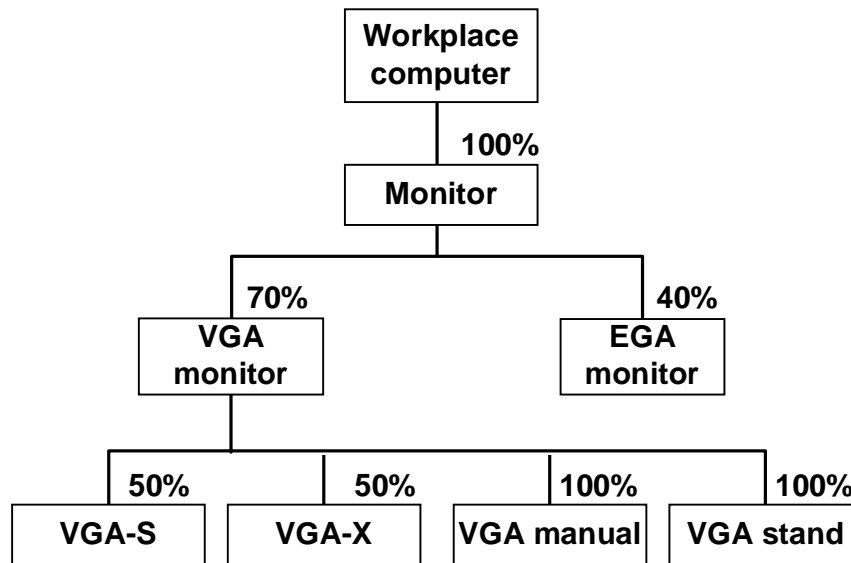
The figure shows a planning bill. The training computer, also known as a product family, has item attribute BOM Item Type set to Planning. Even though it is not an item that you would sell or produce, you create a product family item as you would any other item.

The research computer, workplace computer, and classroom computer have item attribute BOM Item Type set to Standard. These items are produced, stored, and sold as finished goods end items.

The explosion process multiplies the planning family item forecast by the forecast explosion percentages for each of the family members to arrive at a forecast for each of the family members.

There is no requirement that the forecast explosion percentages total 100%. When there is uncertainty in the product mix that will be demanded, the family members can be overplanned to provide a safety stock. Forecast explosion percentages should be managed so that too much inventory does not build up over time. You can create alternative planning bills of material. All alternative planning bills for an item must have the same member items as the primary bill, but you may assign different forecast explosion percentages.

Model Bills of Material



Model Bills

Model bills of material are used by Oracle material planning for forecast explosion and by Oracle Order Entry for entry of sales orders for configured items. They have the following characteristics:

- The parent assembly has a BOM Item Type item attribute of Model.
- The components have BOM Item Type item attributes of Option Class or Standard.

In the figure, the workplace computer is an example of a model bill. It has item attribute BOM Item Type set to Model. The monitor, VGA monitor, and EGA monitor have item attribute BOM Item Type set to Option class. Option classes are categories of options from which you must choose one or more. Even though they are not items that you would sell or produce, you create option class items as you would any other item. In this example, when a customer purchases a workplace computer, the customer is required to choose a monitor. The forecast explosion percentages for the VGA and EGA options are estimates of the product mix that will be sold to customers. Note again that it is not required that the forecast explosion percentages total 100%.

A customer choosing the VGA monitor option class automatically receives the VGA manual and VGA stand, also known as mandatory components or included items. These items have item attribute BOM Item Type set to Standard and the Optional flag set to No. You always produce these items for final assembly or shipment. The VGA-S and VGA-X, also known as options, have item attribute BOM Item Type set to Standard and the Optional flag set to Yes. Forecast explosion percentages indicate that the product mix is evenly split between VGA-S and VGA-X monitors. The customer selects a monitor from the VGA monitor option class, and this selection is then specified on the sales order, produced, and shipped along with the mandatory items and other options selected by the customer.

Planning Bill Explosion

Level	Item Number	Item Type	Optional	Plan %	Orig. Qty.	Curr. Qty.
1	Training	Planning	No	100	200	200
. 2	Research	Standard	Yes	50	100	100
. 2	Workplace	Standard	Yes	35	70	70
. 2	Classroom	Standard	Yes	20	40	40

Performing Forecast Explosion for Planning and Model Bills

To execute forecast explosion of a planning or model bill, use the following process:

1. Assign forecast explosion percentages to each component. The percentage refers to the percentage of sales of the assembly that the component represents. You set and maintain the percentages; Oracle material planning does not automatically calculate, recalculate, or set the percentages. However, you can query sales order, inventory issue, or forecast consumption information to help you determine the planning percentages to use. The percentages may total more than 100%; use this feature if you want to overplan options.
2. Set the item attribute Forecast Control for components to Consume and Derive.
3. Develop a forecast for the product family or model.
4. Execute the forecast explosion process. The forecast explosion calculates forecast entries for each component. The date and bucket type of the component entries are the same as those of the assembly entry. The quantity of each component entry is defined as follows:

$$FQC = FQA * PP$$

where: FQC = Forecast quantity for the component

FQA = Forecast quantity for the assembly

PP = Planning percentage of component in assembly (from BOM)

Planning Bill Forecast Consumption

Level	Item Number	Item Type	Optional	Plan %	Orig. Qty.	Curr. Qty.
1	Training	Planning	No	100	200	190
. 2	Research	Standard	Yes	50	100	90
. 2	Workplace	Standard	Yes	35	70	70
. 2	Classroom	Standard	Yes	20	40	40

Forecast Consumption for Aggregate Bills

- With a planning bill, the process consumes the forecast entry for standard items that the customer ordered. It does not consume the product family forecast entry.

In the above example, you use Oracle Order Entry to enter a sales order for 10 research computers. The forecast consumption process consumes forecasts for 10 of the research computer (*not* the training computer).

Model Bill Forecast Consumption

Level	Item Number	Item Type	Optional	Plan %	Orig. Qty.	Curr. Qty.
1	Workplace	Model	No	100	200	190
. 2	Monitor	Opt Cls	No	100	200	190
. . 3	EGA	Opt Cls	Yes	40	80	80
. . 3	VGA	Opt Cls	Yes	70	140	130
. . . 4	VGA-S	Standard	Yes	50	70	70
. . . 4	VGA-X	Standard	Yes	50	70	60
. . . 4	Stand	Standard	No	100	140	130
. . . 4	Manual	Standard	No	100	140	130

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Forecast Consumption for Aggregate Bills (continued)

- With a model bill, the process consumes the model forecast entry, the option class forecast entries, only the option forecast entries that the customer selected, and the mandatory component and included item forecast entries. You can use this information to help you determine the model bill planning percentages.

In the above example, you use Oracle Entry to enter a sales order for 10 workplace computers with the VGA-X option. The forecast consumption process consumes forecasts for 10 of the workplace computers, monitors, VGA monitors (*not* EGA monitors), VGA-X options (*not* VGA-S options), VGA manuals, and VGA stands.

- When using a sales order that uses a model configuration to final assemble, you perform a later process that creates a standard item number just for the sales order and line. After you do this, the forecast consumption process unconsumes the forecast entries for the sales order line made from the model item and its components. Then it consumes forecast entries from the sales order line based on the new standard item number and its components. The process has consumed the same forecast entries but has used a different bill of material.

Model Bill Explosion

Level	Item Number	Item Type	Optional	Plan %	Orig. Qty.	Curr. Qty.
1	Workplace	Model	No	100	200	200
. 2	Monitor	Opt Cls	No	100	200	200
. . 3	EGA	Opt Cls	Yes	40	80	80
. . 3	VGA	Opt Cls	Yes	70	140	140
. . . 4	VGA-S	Standard	Yes	50	70	70
. . . 4	VGA-X	Standard	Yes	50	70	70
. . . 4	Stand	Standard	No	100	140	140
. . . 4	Manual	Standard	No	100	140	140

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Performing Forecast Explosion for Planning and Model Bills

Note that when the forecast explosion process calculates forecasts for items, it begins at the product family or model item and continues down a bill of material tree until it has calculated a forecast for a standard item. After that, it explodes no further.

In the planning bill example, the forecast explosion process calculates a forecast for the research computer, workplace computer, and classroom computer (with item attribute BOM Item Type set to Standard), but not for the subassemblies and purchased items that you need to produce the research computer, workplace computer, and classroom computer. These subassemblies and purchased items also have item attribute BOM Item Type set to Standard. You plan for these subassemblies and purchased items by using the MPS and MRP planning processes, not the forecast explosion process.

In the model bill example, the forecast explosion process calculates a forecast for the VGA-S and VGA-X options (with item attribute BOM Item Type set to Standard), but not for the subassemblies and purchased items that you need to produce the VGA-S and VGA-X. These subassemblies and purchased items also have item attribute BOM Item Type set to Standard. You plan for these subassemblies and purchased items by using the MPS and MRP planning processes, not the forecast explosion process.

Forecast Sets

Forecast Set: ASCP-D2 Description: ASCP forecast set for Miami

Bucket Type: Days Level: Item Inactive On:

Consumption Options

☒ Consume Outlier Update: 100% Backward Days: 1 Forward Days: 3

Consume Forecast Set Items

Forecast	Description	Inactive On	Demand Class	Customer
<input checked="" type="checkbox"/> PDA_Miami	Planning family forecast			
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				
<input type="checkbox"/>				

Copy/Merge Forecast Forecast Items

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Forecast Sets

(N) Forecast—>Sets

Creating Forecast Sets

You use the Forecast Sets window to create forecast set names and to list forecast names belonging to the forecast set.

1. Enter a forecast set name and description.
2. Select a default bucket type for the entries that you will make into the forecasts of this forecast set. You can override this choice for each forecast entry.
3. Select a forecast level to control the level of detail that you must provide for the forecasts in this forecast set.
4. Select Consume to allow forecast consumption for the forecasts of this forecast set. If you set a value for backward or forward consumption days, you allow consumption of a forecast entry by a sales order, even if the two have different dates.
5. Enter an outlier percentage. If you enter an outlier percentage of less than 100%, you limit the quantity by which a sales order may consume a forecast.
6. Enter at least one forecast name and description.
7. Enter a demand class, if you want to limit forecast copy and merge operations and forecast consumption to forecasts and sales orders with the same demand class.
8. If you have chosen forecast set level Customer, Bill-To, or Ship-To. Enter the customer number and then either the customer ship-to address or customer bill-to address.
9. Select one of the forecasts by highlighting the box at the beginning of the row. Then, click Forecast Items to create forecast items.

[illegible]

(N) Forecast—>Sets (B) Forecast Items

Use this window to specify the item numbers that have entries in this forecast. You can view some of their item attributes.

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Forecast Entries

Bucket	Date	End Date	Number of Buckets	Current	Original	
Days	17/APR/2001	17/APR/2001	1	3000	3000	<input checked="" type="checkbox"/>
Days	26/JUN/2001	26/JUN/2001	1	5000	5000	<input checked="" type="checkbox"/>
Weeks	02/APR/2001	29/DEC/2003	144	5000	5000	<input checked="" type="checkbox"/>

Source Information

Origination: **Manual** Org: Forecast: End Item: End Usage: **Consumptions**

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Forecast Entries

(N) Forecast—>Sets (B) Forecast Items (B) Detail

Creating Forecast Entries

Use this window to create forecast entries for an item number.

- You must enter a forecast level, date, and current quantity:
 - You can create as many entries as you desire for this item number.
 - You can mix bucket types. For example, you can specify the current quarter forecast entries in weeks and the remaining forecast entries in periods.
 - If you enter an end date, you are specifying multiple forecast entries with the same quantity. Note that you can set the date and the end date; you cannot set the date and the number of buckets.
 - You can create multiple forecast entries for one day with no warning or error from Oracle material planning. This most often happens inadvertently when you mix bucket types or specify end dates.
 - If the bucket type is days, the date must be a work day. If the bucket type is weeks or periods, the date must be the first day of the week or period.

Forecast Entries

Forecast Entries (D2)

Forecast Set: **ASCP-D2** Forecast: **PDA_Miami** Item: **PD40001**

Bucket	Date	End Date	Number of Buckets	Current	Original	[]
Days	17/APR/2001	17/APR/2001	1	3000	3000	
Days	26/JUN/2001	26/JUN/2001	1	5000	5000	
Weeks	02/APR/2001	29/DEC/2003	144	5000	5000	

Source Information

Origination: **Manual** Org: Forecast: End Usage: Consumptions

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Creating Forecast Entries (continued)

- If you enter a confidence percentage, you lower the forecast quantity that drives the planning process. For example, if you create a forecast entry for 100 and specify a confidence percentage of 85%, the planning process will plan for you to make or buy 85 rather than 100.
- You may enter a comment about the forecast entry. You usually do this if the entry is unusual in quantity, date, or confidence percentage.

Oracle material planning sets the:

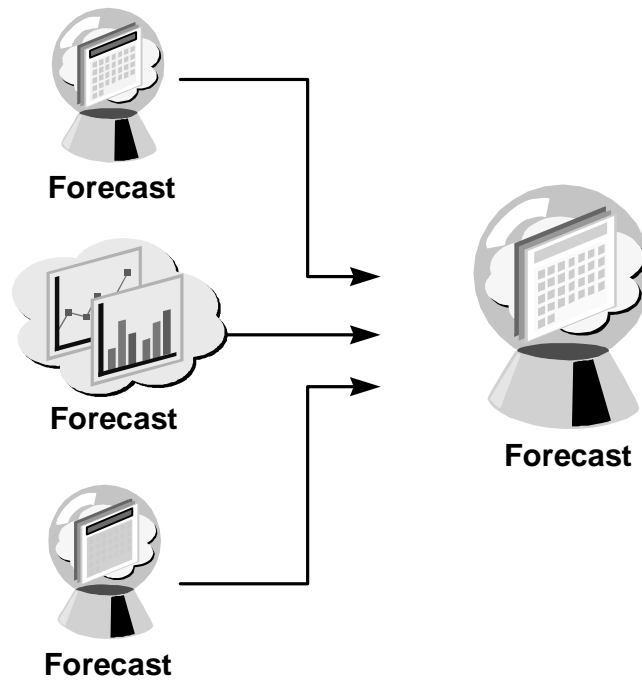
- Number of buckets
- Original quantity the same as the current quantity
- Total quantity, as defined in the following equation:

$$TQ = NOB * CQ$$

where:

TQ	=	Total quantity
NOB	=	Number of buckets
CQ	=	Current quantity

Using Copy/Merge Forecast



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Using Copy/Merge Forecast

You use Copy/Merge Forecast to copy and merge information into a forecast from other forecasts.

Copy/Merge Forecast Conventions

You can copy or merge from any number of sources, but you can copy or merge to only one forecast.

Oracle material planning calls the schedules from which you copy or merge the source forecasts and the schedule to which you copy or merge the destination forecast. A source forecast may be in a different organization from the destination forecast.

Forecast Source List

Source Type	Organization	Name	Description	Demand Class
Forecast Entries	D1	PDA-Sing	Planning family forecast	
Forecast Entries	D2	PDA_Miami	Planning family forecast	

Forecast Source List

(N) Forecast—>Source List

Creating a Forecast Source List

Use the forecast source list when:

- You want to copy or merge a forecast
- You have more than one source

You use the forecast source list to list the sources that you want to use for a forecast copy or merge. You can specify other forecasts as sources in a forecast source list.

1. You must specify a source list name.
2. For each source, you must specify a source type, organization, and name.
3. Select Copy/Merge Forecast to start the copy or merge process.

Copy/Merge Forecast

Copy/Merge Forecast (D1)

Run this Request...

Name: **Copy/Merge Forecast**

Parameters: **PDA-Sing.Forecast Source List.D1.ASCP-SL.No.28/MAR/2001.28/JUN/2001.Yes.Curren**

Language: **American English**

At these Times...

As Soon as Possible

Upon Completion...

☒ Save all Output Files

Notify:

Print to: **3op335ap**

Buttons: Copy..., Languages..., Schedule..., Options..., Help (H), Submit, Cancel

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Copy/Merge Forecast

(N) Forecast—>Source List (B) Copy/Merge Forecast

Starting the Copy/Merge Forecast Process

Use Copy/Merge Forecast to:

- Place information that has already been entered in Oracle Applications as a forecast
- Perform the forecast explosion

Refer to the figure on the next page.

1. Specify the destination forecast, source type, source organization, forecast or source list name, overwrite option, start date, cutoff date, and quantity type.
2. If you select Yes for Explode, the copy or merge process performs a forecast explosion on planning and model bills of material.
3. If you enter a value for Modification Percent, the copy or merge process changes each destination forecast quantity into a percentage of the corresponding source forecast quantity. You can set modification percents between –100 and 100. If you set the Modification Percent value as a positive number, the destination forecast quantity will be smaller than the source forecast quantity. If you set the Modification Percent value as a negative number, the destination forecast quantity will be larger than the source forecast quantity. For example, if the source forecast quantity is 100 and the Modification Percent value is 90%, the corresponding destination forecast quantity is 90.

Copy/Merge Parameters

Parameters

Destination Forecast: Planning family forecast

Source Type:

Forecast Organization: Miami Distribution Center

Forecast/Load Source List: Planning family forecast

Overwrite:

Start Date:

Cutoff Date:

Explode:

Quantity Type:

Consume:

Modification Percent:

Carry Forward Days:

OK Cancel Clear Help

Starting the Copy/Merge Forecast Process (continued)

- 4 If you select Yes for Consume, the copy or merge process performs forecast consumption on the forecast entries. You can select Yes only if the quantity type is Original.
- 5 If you enter a value for Carry Forward Days, the copy or merge process changes each destination forecast date so it is different from the corresponding source forecast date. For example, if the source forecast date is June 30 and there is one carry forward day, the corresponding destination forecast date is July 1. If you set the Carry Forward Days value as a positive number, the destination forecast date will be later than the source forecast date. If you set the Carry Forward Days value as a negative number, the destination forecast date will be earlier than the source forecast date.
- 6 Click OK and then Submit.

Forecast Component Items

Forecast Items (D2)

Forecast Set: **ASCP-D2** ASCP forecast set for Miami Inactive On:

Forecast: **PDA_Miami** Planning family forecast Inactive On:

Item	Description	UOM	Alternate Bill	Bill Type
AS41001	PDA - Palmate	Ea		Standard
AS42001	PDA - Helmsman	Ea		Standard
PD40001	PDA - Family	Ea		Planning

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Forecast Items

(N) Forecast—>Sets (B) Forecast Items (B) Detail

Viewing Forecast Items

After your request has run, you can view the components exploded from the planning family item. Highlight the row for the end item and then click the Detail button. An Item Forecast Entries window similar to the one shown on the next page opens. However, the window will show just the entries for the item highlighted in the Forecast Items window.

View Forecast Item Detail

Item Forecast Entries (D2)

Forecast Set: **ASCP-D2** ASCP forecast set for Miami Inactive On:

Forecast: **PDA_Miami** Planning family forecast Inactive On:

Item	Bucket	Date	End Date	Number of Buckets	Quantity
AS41001	Weeks	02/APR/2001	25/MAR/2002	52	4000
AS41001	Days	17/APR/2001	17/APR/2001	1	2400
AS41001	Days	26/JUN/2001	26/JUN/2001	1	4000
AS42001	Weeks	02/APR/2001	25/MAR/2002	52	1000
AS42001	Days	17/APR/2001	17/APR/2001	1	600
AS42001	Days	26/JUN/2001	26/JUN/2001	1	1000
PD40001	Weeks	02/APR/2001	29/DEC/2003	144	5000
PD40001	Days	17/APR/2001	17/APR/2001	1	3000
PD40001	Days	26/JUN/2001	26/JUN/2001	1	5000

Source Information

Origination: **Exploded** Org: **D2** Forecast: **PDA_Miami**

End Item: **PD40001** End Usage: **.8**

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Item Forecast Entries

(N) Supply Chain Planning —>Forecast—>Entries

An alternative method for viewing forecast entries is to open the Item Forecast Entries window directly from the Navigator window. When you use this approach to query your forecast set and forecast name, all of the forecasted items are displayed.

Bucketed View of Forecast Detail

Forecast Bucketed Entries (D2)

Forecast Set: **ASCP-D2** Forecast: **PDA_Miami** Item: **AS41001**

Options

Bucket Type: **Days** ☐ Include Entries Before Start Date

Display: **Units** Date: **28/MAR/2001** - **28/JUN/2001**

	16/APR/2001	17/APR/2001	18/APR/2001	19/APR/2001	20/APR/2001
Original	800	3200	800	800	800
Consumed	0	0	0	0	0
Current	800	3200	800	800	800
Cum Original	8800	12000	12800	13600	14400
Cum Consumed	0	0	0	0	0
Cum Current	8800	12000	12800	13600	14400

Forecast Bucketed Entries

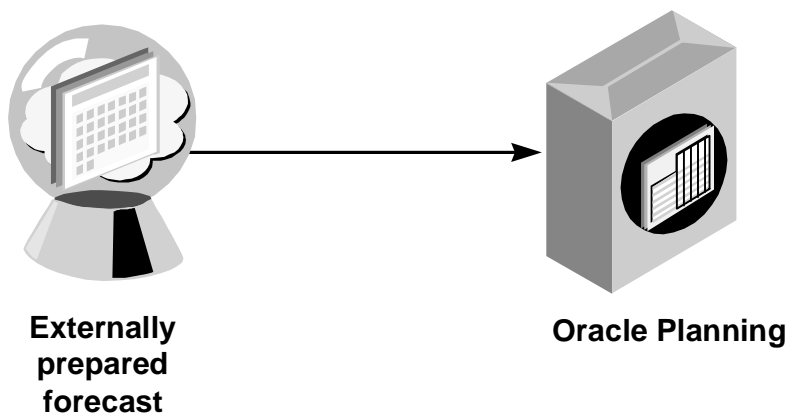
(N) Supply Chain Planning—>Forecast—>Entries (B) Bucketed

Viewing Forecast Entry Details

This view provides a forecast item details in a time bucketed view. In the figure, the display is shown in daily time buckets. Note that the forecast of 4000 per week is spread over the five workdays and displayed as 800 per day. On April 17, the forecast is 3800, the result of adding together the weekly forecast of 800 per day plus the 2400 forecast on that specific day.

Refer to “Forecast Entries” earlier in this lesson.

Open Forecast Interface



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Open Forecast Interface

Use the Open Forecast Interface concurrent process when you develop forecasts using another computer system and bring the information into Oracle material planning.

Master Demand Schedule

Independent Demand Sources

Sales orders
- Internal
- External

Forecasts

**Interorganization
planned
orders**

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Master Demand Schedule

You use a master demand schedules to create consolidated statements of independent demand. An MDS contains:

- Item numbers
- Due dates
- Quantities

Independent Demand Sources

You can use the following three sources of independent demand to load a master demand schedule:

- Sales orders (internal and external)
- Forecasts
- Interorganization planned orders

MDS Names

Name	Description	Demand Class	Relieve	Inactive On
<input type="checkbox"/> MDS-D2-SCP	D2 MDS FOR SUPPLY CHAIN PLANNING		<input checked="" type="checkbox"/>	
<input checked="" type="checkbox"/> MDS-D2-APS	D2 MDS Advanced SCP		<input type="checkbox"/>	
<input type="checkbox"/> MDS-DRPUI			<input checked="" type="checkbox"/>	
<input type="checkbox"/> MDS-MR-SYS	SYS TEST		<input type="checkbox"/>	
<input type="checkbox"/> MDS-ORG2	ORG2 MDS FOR SUPPLY CHAIN PLANNING		<input checked="" type="checkbox"/>	
<input type="checkbox"/> MDS-PROD	D2 PRODUCTION MDS		<input checked="" type="checkbox"/>	
<input type="checkbox"/> MDS-SCP-H	D2 MDS for Horizontal SCP Planning		<input checked="" type="checkbox"/>	
<input type="checkbox"/> MDS-SKUI	UI testing		<input type="checkbox"/>	
<input type="checkbox"/> MV_MDS_D1	VISIONPAD DEMAND D2		<input type="checkbox"/>	
<input type="checkbox"/> OC_MDS2	OC_MDS2	USSALES	<input checked="" type="checkbox"/>	

Load / Copy / Merge Items

Master Demand Schedules

(N) Supply Chain Planning—>MDS —>Names

Creating Master Demand Schedules

Use the Master Demand Schedules window to enter information about master demand schedules. You can create and name as many master demand schedules as you need.

1. Enter a master demand schedule name and description.
2. If you enter a demand class, you limit master schedule load, copy, and merge operations and master demand schedule relief to sales orders with the same demand class.
3. Select Relieve to allow relief for this master demand schedule. You use shipment relief to instruct Oracle material planning to reduce a master demand schedule entry when you ship a sales order. A shipped sales order is no longer a demand. Use shipment relief if you replan your master production schedule or material requirements plan from the master demand schedule without erasing and reloading the master demand schedule.

You must also set the Personal Profile option MRP: Consume MDS to Yes. Note that although the Personal Profile option references consumption, it actually enables master demand schedule relief. There is no such feature as master demand schedule consumption.

4. Select one of the master demand schedules by highlighting the box at the beginning of the row and then click Items to create master demand schedule items.

MDS Items

Item	Description	UOM	MPS Explosion Level	Demand Time Fence	Bill Type	Planning Method	Repetitive	
AS41001	PDA - Palmate	Ea	10		Standard	MPS planning	<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	
							<input type="checkbox"/>	

Master Demand Schedule Items

(N) MDS—>Names (B) Items

Creating Master Demand Schedule Items

Use the Master Demand Schedule Names window to specify the item numbers that have entries in this master demand schedule as well as to view some of their item attributes.

1. Enter an item number and save. The item attributes appear.
2. Select item numbers by highlighting the box at the beginning of the row and then click Detail to create the master demand schedule entries.

MDS Entries

Master Demand Schedule Entries (D2)

Schedule: **MDS-D2-APS** Item: **AS41001**

Show Version: **Current**

Date	End Date	Number of Days	Quantity	Current	Original	Total
10/01/00			-			

Source Information

Origination: Sales Order:

Org: Forecast/Schedule:

Reliefs

(N) MDS—>Names (B) Items (B) Detail

Use the Master Demand Schedule Entries window to manually enter master demand schedule entries for an item number.

- For discretely planned items and repetitively planned items without an end date, the date is the ship date, and the current quantity is the ship quantity. For repetitively planned items, the date is the first day of a sequence of daily shipments, the end date is the last day of a sequence of daily shipments, and the current quantity is the daily shipment quantity.

You can create multiple master demand schedule entries for one day with no warning or error from Oracle material planning. This sometimes happens inadvertently.

2. You can enter a comment about the master demand schedule entry. You usually do this if the entry is unusual in quantity or date.

Load MDS

Load/Copy/Merge Master Demand Schedule (D2)

Run this Request...

Copy...

Name: Load/Copy/Merge MDS

Parameters: MDS-D2-APS.Specific Forecast.D2.PDA_Miami.No sales orders..Ignore demand time

Language: American English Languages...

At these Times...

As Soon as Possible Schedule...

Upon Completion...

☒ Save all Output Files

Notify:

Print to: 3op335ap Options...

Help (H) Submit Cancel

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Load/Copy/Merge Master Demand Schedule

(N) Supply Chain Planning—>MDS —>Names (B) Load/Copy/Merge

Loading MDS

You use the Load/Copy/Merge functionality to create MDS entries from a forecast or another MDS.

Click the Parameters field to open the Parameters window. After you complete the parameters information (see the Parameters window on the next page), click the Submit button in this window to launch the request.

Load MDS Parameters

Destination Schedule	MDS-D2-APS	D2 MDS Advanced SCP
Source Type	Specific Forecast	
Source Organization	D2	Miami Distribution Center
Source Name	PDA_Miami	Planning family forecast
Include Sales Orders	No sales orders	
Sales Orders Demand Class		
Demand Time Fence	Ignore demand time fence	
Overwrite	No	
Start Date	28/MAR/2001	
Cutoff Date	28/JUN/2001	
Explode	No	
Quantity Type	Current	
Consume	No	
Modification Percent	0	
Carry Forward Days	0	
Forward Consumption Days	0	
Backward Consumption Days	0	
Outlier Percent	100	

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Parameters

(N) Supply Chain Planning—>MDS —>Names (B) Load/Copy/Merge

Loading MDS Parameters

1. Enter the name of the MDS you want to load.
2. If you are loading from a forecast, the source type is Specific Forecast.
3. Enter the forecast source organization and source forecast name.

View MDS Entries

Item Master Demand Schedule Entries (D2)

Schedule: **MDS-D2-APS** **D2 MDS Advanced SCP** Inactive On:

Show Version: **Current**

Item	Date	End Date	Number of Days	Quantity	Current/Rate	O	[]
AS41001	02/APR/2001		1		4000		
AS41001	09/APR/2001		1		4000		
AS41001	16/APR/2001		1		4000		
AS41001	17/APR/2001		1		2400		
AS41001	23/APR/2001		1		4000		
AS41001	30/APR/2001		1		4000		
AS41001	07/MAY/2001		1		4000		
AS41001	14/MAY/2001		1		4000		

Source Information

Origination: **Forecast** Sales Order:

Org: **D2** Forecast/Schedule: **PDA_Miami**

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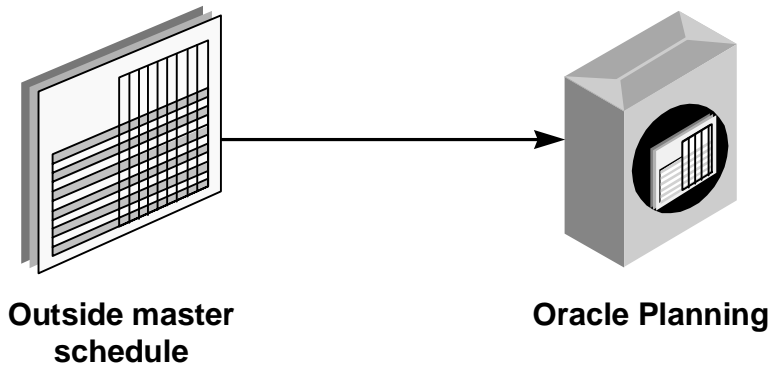
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Item Master Demand Schedule Entries

(N) Supply Chain Planning—>MDS —>View Entries

After the Load/Copy/Merge process completes, you can use this window to view the entries loaded into your MDS.

Open Master Schedule Interface



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Open Master Schedule Interface

Use the Open Master Schedule Interface concurrent process when you develop master demand schedules using another computer system and bring the information into Oracle material planning.

Forecasting Summary

- **Forecast sources**
 - Oracle Demand Planning
 - Oracle Material Planning
 - Manual entry into forms
 - External method; imported API
- **Aggregate forecasting uses planning and model bills to guide calculations**

Summary: Oracle Material Planning Forecasts

Forecast levels specify the level of detail of the forecast entries.

Forecast bucket types to specify the time period that a forecast entry covers.

Aggregate forecasts calculate forecasts for component items from forecasts of their assemblies. The calculating process is a BOM explosion.

- Use Forecast Sets to group forecasts.
- Use Forecast Items to specify the items that have entries in a forecast.
- Use Forecast Entries to create forecast entries for an item number.
- Use the Open Forecast Interface concurrent process when you develop forecasts using another computer system and bring the information into Oracle material planning.

MDS Summary

- **Load MDS to consolidate independent demand:**
 - Sales orders
 - Demand forecast
 - Interorganization planned orders
- **Loading an MDS requires a process that is similar to that of loading a forecast**

Summary: MDS

You can use three sources of independent demand to load a master demand schedule: forecasts, sales orders (internal and external), and interorganization planned orders.

- Use the Master Demand Schedule Window to enter information about master demand schedules. Use the Master Demand Schedule Items window to specify the item numbers that have entries in this master demand schedule as well as to view some of their item attributes. Use the Master Demand Schedule Entries window to create master demand schedule entries for an item number.
- Use the Open Master Schedule Interface concurrent process when you develop master demand schedules using another computer system and bring the information into Oracle material planning.

Summary

In this lesson, you should have learned how to:

- **Describe forecasts, sets, methods, and levels**
- **Create and load forecasts**
- **Describe master demand schedules**
- **Create and load master demand schedules**

Practice 5-1 Overview

This practice covers completing Part III of the APS case study:

- **Creating forecast set**
- **Entering a forecast manually**
- **Loading, copying and merging a forecast**
- **Creating and loading a master demand schedule**

Performing Practice 5-1

For detailed instructions on performing this practice, see Part III in Appendix B, “Case Study.”

6

Oracle Demand Planning

Functions and Features Overview

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Objectives

After completing this lesson, you should be able to do the following:

- **Explain features and benefits of Oracle Demand Planning (ODP)**
- **Describe demand planning roles and processes**

Overview

This lesson provides an overview of the Oracle Demand Planning product. Detailed functionality for this product is covered in a separate three-day course: Oracle Demand Planning.

What Is Demand Planning?

- **A collaborative process:**
 - Involving internal and external participants
 - That collects and organizes information needed to estimate future sales
- **A crucial function for improving operational plans:**
 - Reduced inventory levels
 - Improved customer satisfaction

What Is Demand Planning?

Demand planning involves more than forecasting. It is a collaborative process involving internal and external participants. Information from several sources is collected and organized to make a projection of sales.

This is a crucial function for improving operational plans. Successful demand planning results in reduced inventory levels and improved customer satisfaction.

Oracle Demand Planning (ODP) is an integrated module within the Oracle Advanced Planning and Scheduling (OAPS) application suite. Oracle Demand Planning assists in the process of creating forecasts. These forecasts are projections of demand, primarily for finished goods.

Demand Distortions

- **Promotions**
- **Competitors' responses to promotions**
- **Lot-size discounts**
- **Fiscal budget cycle**
- **Allocations**
- **Panic**
- **Hedging, commodity futures**



Challenges for Demand Management

Planning for demand is a difficult challenge because so many factors can cause demand to change from its normal course.

Promotions are intended to change the timing or magnitude of demand. Competitors can be expected to respond to promotions. For example, when one airline changes fares for a route, other airlines serving that same route are likely to respond with similar pricing.

Lot size discounts provide incentive for customers to place larger orders, less frequently than they ordinarily would.

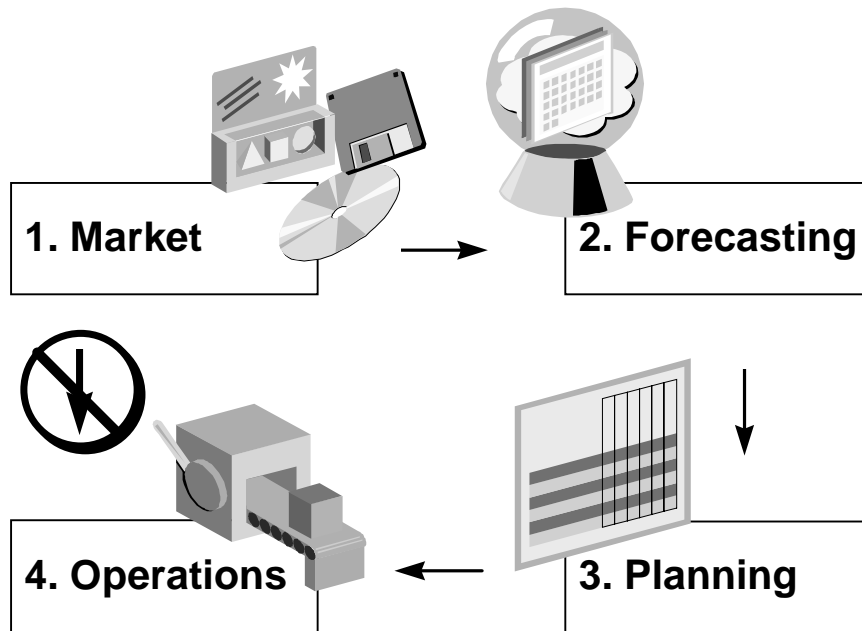
Much of demand seasonality can be traced to budget cycles. Near the end of a fiscal year, budget gamesmanship requires managers to spend their entire budget or incur a reduction for the next year.

Items in short supply tend to be hoarded in regions of low demand rather than being redistributed. This makes shortages across the system worse. Local sales forecasts are artificially inflated in the hope of gaining a greater allocation. Allocation processes can mask the real level of demand.

Panic can cause hoarding and artificial shortages. For example, the demand for bottled water increased just prior to New Year's Day 2000.

Hedging and futures trading buffer price uncertainty, but sometimes these practices disrupt commodity markets.

Improving Operational Plans



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Planning Versus Reacting

Forecasts always contain some error variance, but the only alternative to forecasting is not forecasting. In other words, the choice is between making operations plans that are based on forecasts that contain some errors, or reacting to the current instant market conditions with a series of short-range operations decisions.

The figure indicates that it is usually undesirable to let the market directly drive production operations. Reaction to dynamic markets requires rapid changes in usage of operations resources, such as labor, materials, capital equipment and distribution facilities. This chaotic approach is costly, difficult to implement, and often loses sight of strategic goals.

Forecasting is essential to the planning process. Better forecasts tend to improve planning processes. Making use of all available information sources tends to result in better forecasts, provided the information is organized into a usable format.

Oracle's Demand Planning enables manufacturers to coordinate information from a broad range of sources to systematically create better forecasts. Demand Planning also improves the operations planning process by providing the information necessary to make product-mix decisions in a manner that is consistent with the strategic goals of the company.

Demand Planning Benefits

- **Improve forecast accuracy:**
 - **Manage demand distortions**
 - **Plan collaboratively**
- **Improve operational plans:**
 - **Inventory reduction**
 - **Higher fill rates**
 - **Higher revenue**

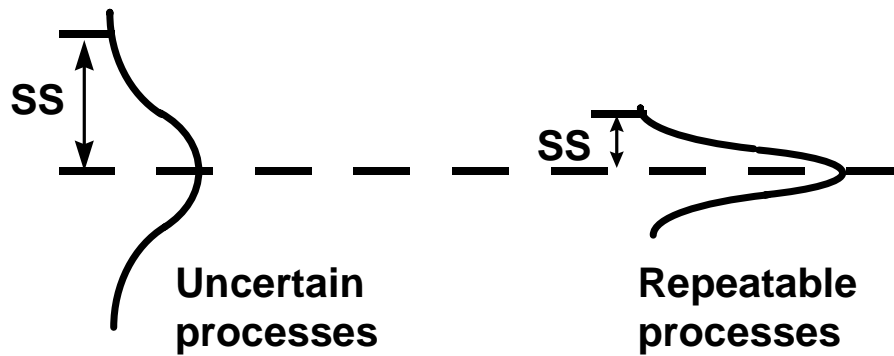


Demand Planning Benefits

Oracle Demand Planning improves forecast accuracy by providing the capability to effectively manage demand distortions and plan collaboratively.

Oracle Demand Planning provides the functionality necessary to improve operational plans, as well as improve the company's ability to manage its profitability and customer expectations.

Impact of Forecast Accuracy on Safety Stock Requirements



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Safety Stock and Uncertainty

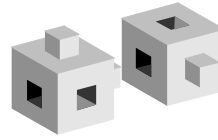
The purpose of safety stock is to buffer uncertainty. One cause of uncertainty is forecast error. When forecasts are inaccurate, more safety stock is needed to cover shortages.

Actual sales are sometimes a poor measure of true demand. Sales can be limited to something less than demand when problems in the supply chain prevent getting the right product to the right place at the right time. Demand forecasts based on historical periods when supply chain problems were causing lost sales tend to underestimate future demand. Safety stock will be consumed.

Marketing promotions and special events can have a profound influence on sales. Sales history alone might not provide enough information for estimating the sales boost from an innovative promotion. When the promotion is underestimated, safety stock will be consumed.

To quickly respond to customer demand, companies having long manufacturing lead times must prepare long-range forecasts to anticipate that demand. Since long-range forecasts usually are very inaccurate, a large amount of safety stock is needed. Several competitive advantages can be gained by reducing manufacturing lead time. Shorter lead time reduces forecast horizon, increases accuracy, and reduces safety stock requirements, and the company reduces the amount of time and resources spent in making the wrong things. This frees up capacity, which in turn reduces lead time.

Key Features



- **Internet collaboration**
- **Integrate demand forecasts into Advanced Supply Chain Planning**
- **Unlimited scenarios**
- **Multiple statistical methods**
- **Automatic selection of best-fit model**
- **Multidimensional analysis**
- **Exception reporting and feedback**

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ODP Key Features

Oracle Demand Planning supports Internet collaboration, incorporating information from sales, marketing, operations, and customers. ODP also provides the tools and techniques for building a forecast of demand, which in turn will be used to drive the supply chain planning process.

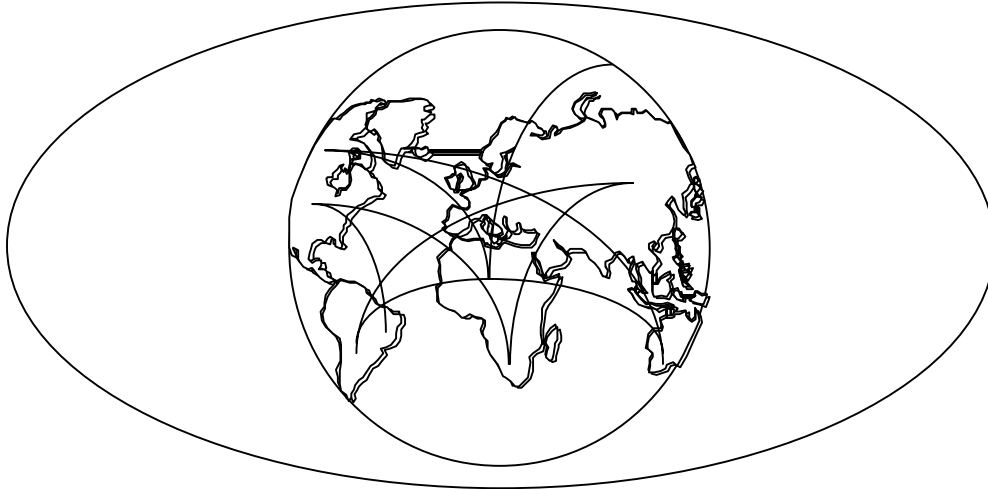
The online analytical process supports ad hoc creation of an unlimited number of scenarios that can be analyzed within the system. It also supports multidimensional analysis for ad hoc reporting and graph generation.

The demand planner can select from several statistical forecasting methods or can direct the system to make an automatic selection of the statistical model that performs best on historical data.

Other key features include performance measures, alert notification, and predefined exception reports.

100% Internet-Based Solution

- **Web browser access**
- **Low cost to deploy**



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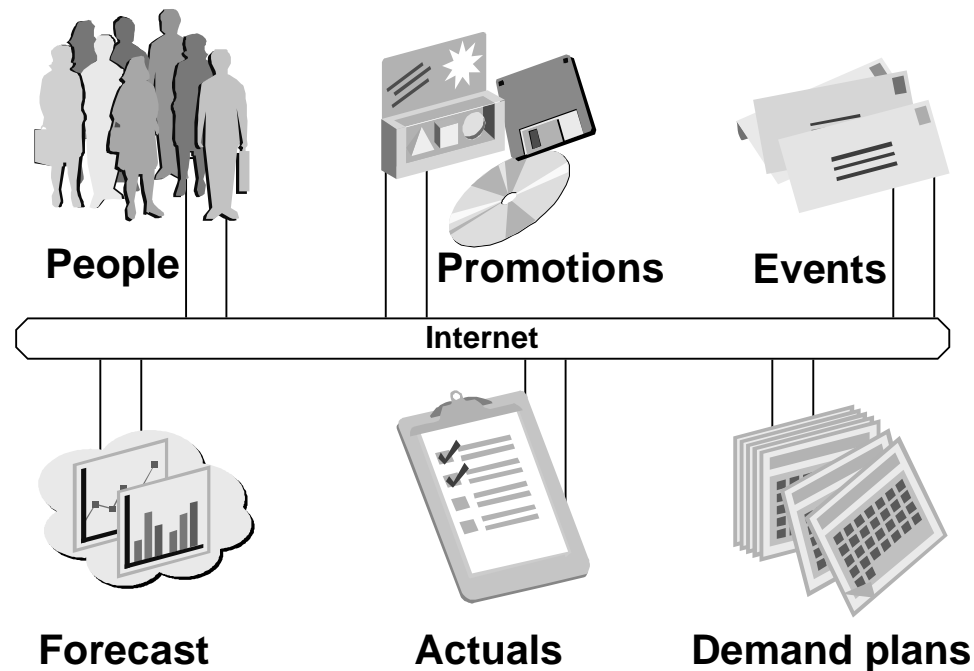
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Internet-Based Solution

Oracle Demand Planning is an easy-to-use Internet-based solution for creating forecasts and developing collaborative demand plans.

Only a Web browser is required to access the application, which enables low-cost deployment of powerful demand planning tools to all internal and external participants in the demand planning process.

Collaborative Forecasting



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Collaborative Forecasting

Oracle Demand Planning provides a robust Internet-based framework for developing collaborative demand plans and forecasts.

You can collect the data you need from multiple disparate sources and provide secure access to portions of the demand plan. You can also manage multiple scenarios to develop a collaborative consensus demand plan. The integration between Oracle Advanced Supply Chain Planning and Oracle Demand Planning also enables you to manage the balance between production capabilities and market needs.

Collaboration Reduces Uncertainty

Instead of forecasting your customers' future demand and maintaining safety stock and extra capacity because you will guess wrong, why not just ask your customers? One reason is that adversarial price negotiations require that supplier-customer relationships be kept at arms length. Sharing information in an adversarial environment results in disadvantages at the negotiation table.

Collaboration is practical in environments where all can gain by sharing information, and where the incentive to maintain trust over the long term is greater than the incentive to use information for temporary unilateral advantage. When collaborative arrangements are carefully established throughout a supply chain, many competitive advantages accrue to the group. Supply chains built upon arms-length relationships cannot survive in international free markets for long after collaborative supply chains enter. No longer will competition be company against company. Instead, competition will be supply chain against supply chain.

Information Visibility

- **Deploy information using the Web**
- **Information visibility across the supply chain**
- **Internal and external collaboration with secured access to plans**
- **Workflow gets the right information to the right place quickly**

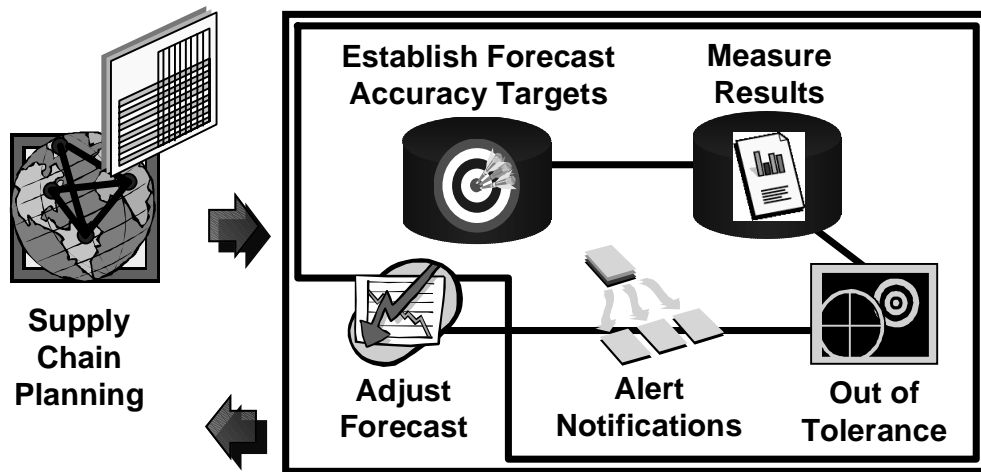
Sharing Information with Alliance Partners

By focusing on what they do best, collaborative businesses leverage a collection of core competencies across the supply chain to meet customer requirements. Emergence of virtual enterprises requires complete end-to-end visibility across the supply chain from the suppliers' suppliers to the customers' customers. In addition, the ability to collaborate across the global supply chain necessitates increased collaboration between every supply chain participant.

Oracle Demand Planning extends the collaborative features of Oracle Applications. It is built on Oracle's Internet computing architecture, which enables all of the applications to be deployed over the Internet or your corporate intranet. ODP is also completely integrated with Oracle's Self-Service Web Applications.

Continuous Improvement

- Integrated performance management
- Exception notifications
- Oracle Workflow process automation



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Integrated Performance Management

- Set targets for continuous improvement.
- View, measure and feedback results.
- Compare performance to targets.
- Manage by exception.
- An alert is sent when performance measures miss the targets.
- Process automation using Oracle Workflow manages the demand planning processes.

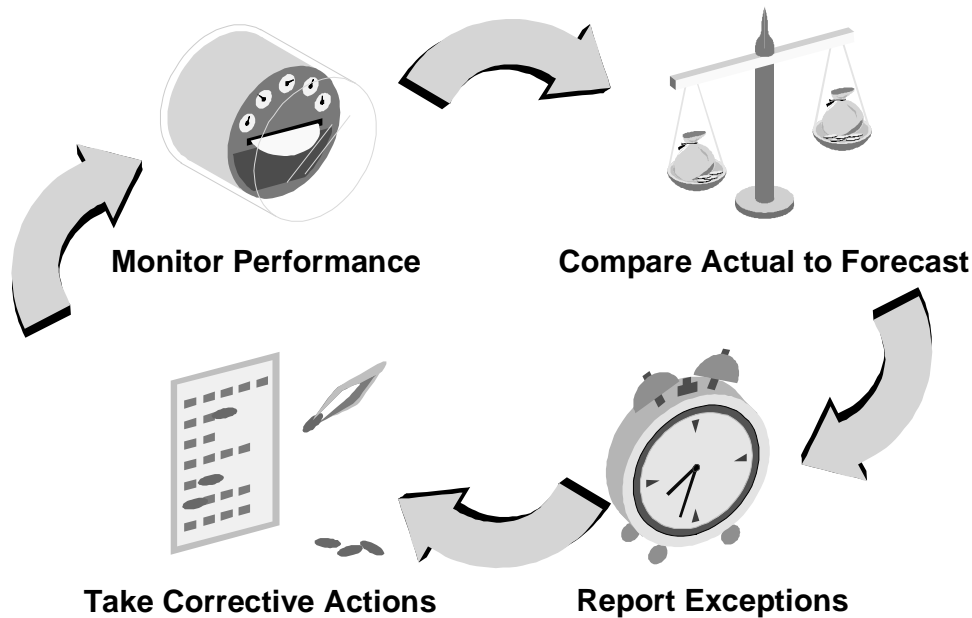
Alert Notifications

Oracle Demand Planning provides the mechanism to create alerts based on forecast targets. When the target is missed, a notification is automatically triggered for corrective action.

Workflow

Oracle Demand Planning provides the control mechanisms to manage the collaborative nature of forecasting. These mechanisms include notifications, data collection, and execution of forecasting, exception reports and performance analysis based on an event or calendar. The customer can configure the schedule on which these tasks are performed, as well as the sequencing of the tasks.

Performance Feedback



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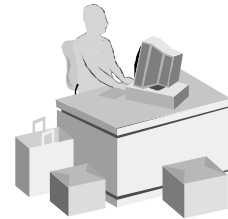
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Feedback Loop

- **Monitor performance:** Two types of performance monitoring are supported: forecast accuracy, and tracking actual versus plan. Both types of monitoring can be connected to the alert mechanism within Demand Planning.
- **Report exceptions:** By comparing the state of the business with the needs of the market, exception reports highlight areas of greatest concern. Demand Planning has a strong set of tools available to define the conditions to test. The customer can define a common set of exception reports accessible by all demand planners, and the demand planner can create reports for customized analyses.
- **Ad-hoc reports and graphs:** This feature is used while a forecast is being developed. It gives you an unlimited number of views into data along any of the defined dimensions. You can display the reports and graphs in any unit of measure defined on the planning server. Both reports and graphs enable the demand planner to drill-down on any row or column to more detail. From within a report, the demand planner can adjust forecasts, assuming the data is not locked.
- **Audit trails:** All forecasts, scenarios, and overrides have audit trails. These trails are helpful in understanding how a forecast was created and adjusted.

Statistical and Analytical Features

- **Multiple forecasting techniques**
- **Selection of best-fit model**
- **Multidimensional analysis**
- **Performance tracking**



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ODP Features: Statistical and Analytical

- **Multiple forecasting techniques:** Oracle Demand Planning includes a broad range of statistical forecasting techniques, as well as automatic outlier detection and filtering capabilities.

Statistical forecasts provide the baseline information for Demand Planning. They are used as the initial estimate of demand. Oracle Demand Planning selects the best-fit model for each series of forecasts to use based upon historical demand and trends and a knowledge base of exception rules.

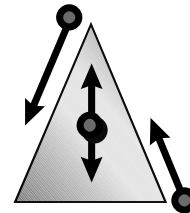
After statistical forecasts are generated, demand planners review and adjust the baseline forecasts to account for factors that are not exhibited in the historical data: for example, knowledge about a promotion scheduled three months into the future.

- **Multidimensional analysis:** You can use several forecast dimensions, such as product family, geographic region, and time, and define your own dimensions. Then you can use the system to analyze the information along various dimensions. For example, you can compare how different product families sell in a specific region during a season of the year.

The system can be used to benchmark performance. The online analytical processing (OLAP) engine contained in the system supports a broad range of metrics to compare actuals to plan, as well as to study further the trends within actuals.

Scenarios, Reconciliation, and Consolidation Features

- **Multiple forecasting scenarios**
- **Top-down, middle-out, and bottom-up reconciliation strategies**
- **Forecast adjustments**
- **Multiple units of measure**
- **Convert units to currency and vice versa**
- **Forecast consolidation**



ODP Features: Scenarios, Reconciliation, and Consolidation

- **Multiple forecasting scenarios:** Oracle Demand Planning supports ad-hoc creation of an unlimited number of scenarios, which in turn can be analyzed within the system. The analysis provided across scenarios can be along any dimension and at any level. Scenarios can also be compared in terms of volume or value.
- **Reconciliation and firm adjustments:** Forecast reconciliation can be performed at any level of detail. Bottom-up data is forecast at the lowest level and rolled up to the most aggregate level. Top-down data is forecast at the most aggregate level and then spread down to the lowest level of detail. Finally, middle-out data is forecast at an intermediate level and spread down to the lowest level of detail and then rolled up to the most aggregate level. Adjustments made in the hierarchy are first spread down and then rolled up. Values can be protected so that they are not affected by adjustments originating elsewhere in the hierarchy. These values are protected throughout the lower-level hierarchies. Adjustments can also be entered as percentages.
- **Multiple units of measure and converting units to currency:** Oracle Demand Planning supports multiple units of measure. It has the capability to equalize lower-level units of measure at the upper levels. For example, bottles at the item level can be converted to cases at the product family level. Forecasts can be converted from units to currency and vice versa. Forecasts can be entered in units or in monetary values.
- **Forecast consolidation:** Oracle Demand Planning captures demand from all sources, consolidating demand so that it can be summarized by item, product line, region, time, organization, and a variety of other dimensions.

General Features

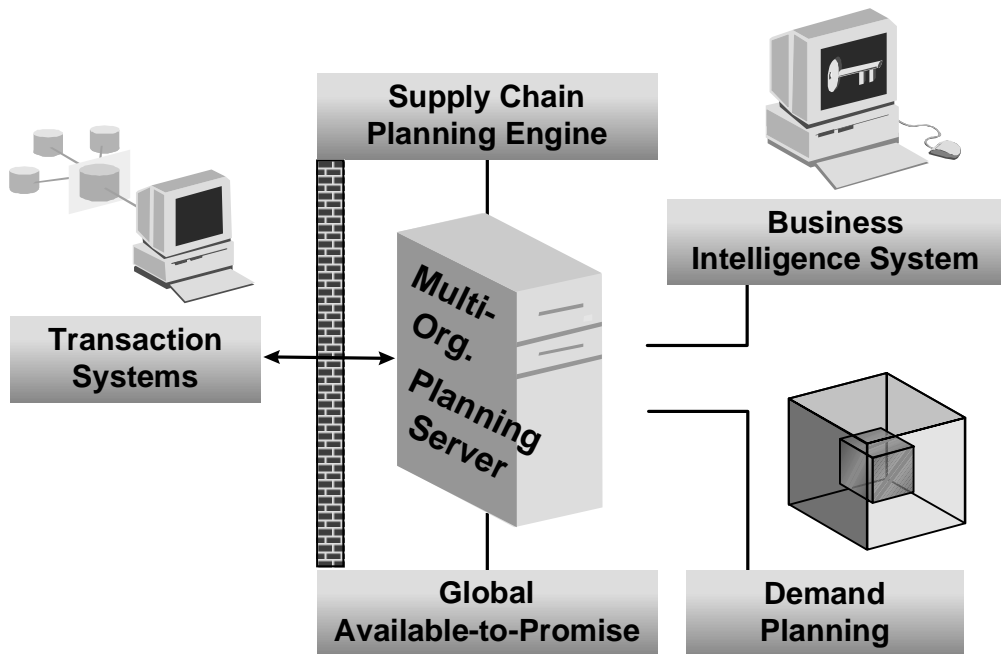
- **Activity log**
- **Annotated forecast changes**
- **Multiple allocation rules**
- **Forecast Wizard**
- **New product introductions**
- **Event and promotion management**
- **Predefined reports**



ODP Features: General

- **Activity log:** Oracle Demand Planning maintains an activity log that captures system changes made to the forecast worksheet.
- **Annotated changes:** Oracle Demand Planning provides the ability to annotate changes to individual cells in the forecast worksheet so that the demand planner can explain changes or store reminders.
- **Multiple allocation rules:** The demand planner has the option to spread down the forecast using allocation weights based on the history or on the forecast.
- **Forecast Wizard:** A step-by-step interactive guide walks the demand planner through the process of creating a new forecast.
- **New product introductions and event and promotion management support:** Oracle Demand Planning supports new product introduction activity as well as events and promotions that affect demand plans for product families and item categories. The new product forecast can be based on another product forecast or the history of an existing product or products. Demand planners can enter coefficients that represent a percentage change to be applied to the statistical forecast for managing events, promotions, phase-ins, and phase-outs.
- **Predefined reports:** A set of eighteen predefined reports is shipped with Oracle Demand Planning. You can create and save ad-hoc reports as well.

Integrated Modules



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Demand Planning Integration

Statistical and final forecasts from Demand Planning are integrated with Advanced Supply Chain Planning, Business Intelligence System, and Global Available-to-Promise (ATP) Server. Those modules in turn publish information from the planning server to transaction systems for suppliers, manufacturing plants, and distribution networks.

Planning Server Information

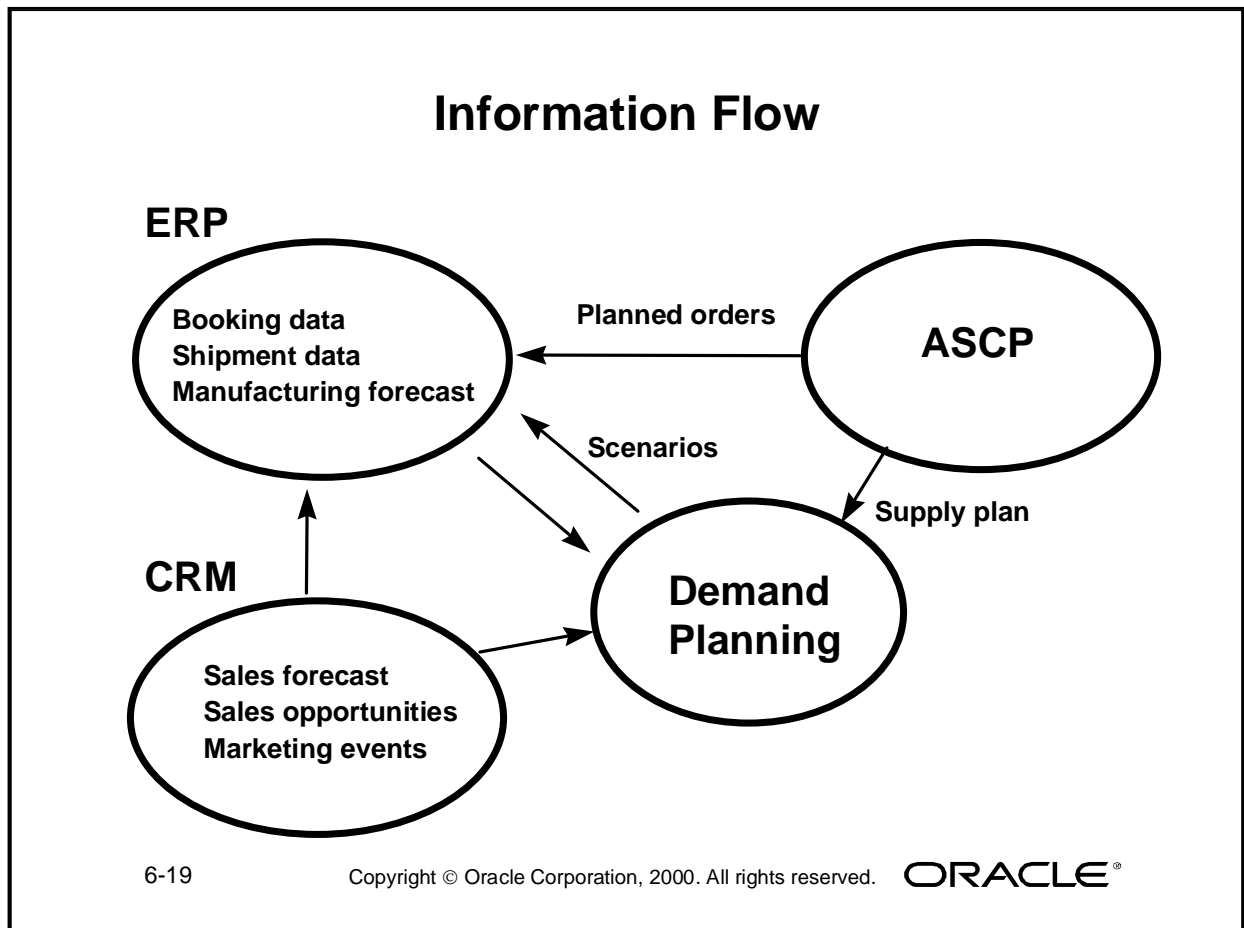
- **Historical sales**
- **Marketing plans**
- **Sales plans**



Information Is Central

Oracle Demand Planning is based on a central repository of information called a planning server. The planning server provides a single source of data integrated in such a way that it can answer a broad range of business questions. Oracle Demand Planning uses much of this information to support the forecasting process. The key areas of information are:

- **Historical sales:** This forms the statistical base for generating demand forecasts. History is particularly useful where trends and seasonal factors repeat from year to year. Sales data can be captured in several ways, most commonly as shipments, orders, or actual sales. Numerous statistical methods have been developed to project historical trends and patterns into the future.
- **Marketing plans:** Marketing influences demand through pricing, advertising, promotions, packaging, education, and new product introductions. Marketing programs use these tools to raise the level of demand or to change the timing of demand. When the impact of previous marketing plans can be estimated, this information, combined with marketing plans for the future, can be used to improve the accuracy of demand forecasts.
- **Sales plans:** Through their direct relationships with customers, salespersons often have a good sense of what orders will be forthcoming. This information can be a valuable indicator of future demand; however, it directly applies only to existing customers. When patterns observed by the sales force differ from patterns included in the marketing plan, it is often useful to find the cause.



Information Flow

Information can be collected from multiple source instances (10.7, 11.0, or 11*i*) using out-of-the-box collection programs for discrete manufacturing. There is out-of-the-box 11*i* integration for OPM, with 10.7 and 11.0 OPM being consulting solutions.

The information is collected, moved to staging tables in the Demand Planning Server, and then moved to the Oracle Express database. Once a forecast has been generated in Express, it is submitted back to the Demand Planning server and made available for operational planning.

The forecast can also be published back to the source instance for release 10.7 and 11.0 customer bases. Scenarios replace the concept of forecast sets used in these earlier releases.

Statistical Forecasting Methods

- **Exponential smoothing:**
 - **Single**
 - **Double**
 - **Holt-Winters**
- **Regression:**
 - **Linear**
 - **Nonlinear**



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Statistical Forecasting Methods

Oracle Demand Planning includes several time-series forecasting methods. Time-series forecasts identify trends and patterns existing in demand history data and then base demand projections on the assumption that historical trends and patterns will repeat in the future.

Major advantages of using time-series methods include:

- They are well suited in situations where a large number of products need to be forecasted.
- They work well for products having fairly stable historical demand data.
- They are useful to smooth out short-term random fluctuations in demand data.
- They are useful for short-term and mid-term forecasting.

Disadvantages include:

- They can be slow to recognize a shift in the trend and general level of demand.
- They sometimes require a significant amount of demand history upon which to base projections.
- They cannot account for factors that affect demand but have not occurred in the past.
- They are ineffective for long-term forecasts.

Selection of Best-Fit Model

- **Geneva forecast engine**
- **Rapidly determines which forecasting models are likely to produce the best statistical forecasts**
- **Best-fit selection from nine models**
- **Outlier detection and filtering**
- **Seasonality and erratic demand filtering**



Automatic Best-Fit Model

There are many ways to forecast future demand based on the past. It is sometimes difficult to decide which forecasting technique to use. Oracle Demand Planning uses the Geneva automated time-series forecasting (ATSF) algorithm to select the best technique. The forecast technique resulting in the lowest mean squared error (MSE) becomes the recommended approach, until an alert causes the techniques to be reevaluated.

The forecast techniques used are:

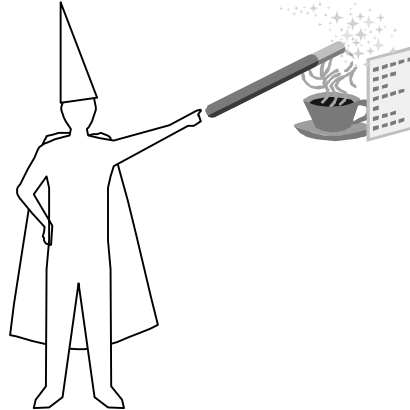
- Linear regression
- Five types of nonlinear regression
- Single exponential smoothing
- Double exponential smoothing
- Holt-Winters exponential smoothing

Data filters are used to identify and repair the following demand data situations that would otherwise distort the forecast results:

- Large outliers
- Sparse history
- Incomplete seasonal cycles

Demand Planning Forecast Wizard

- **What-if simulations**
- **Interactive guide**
- **Four-step process**



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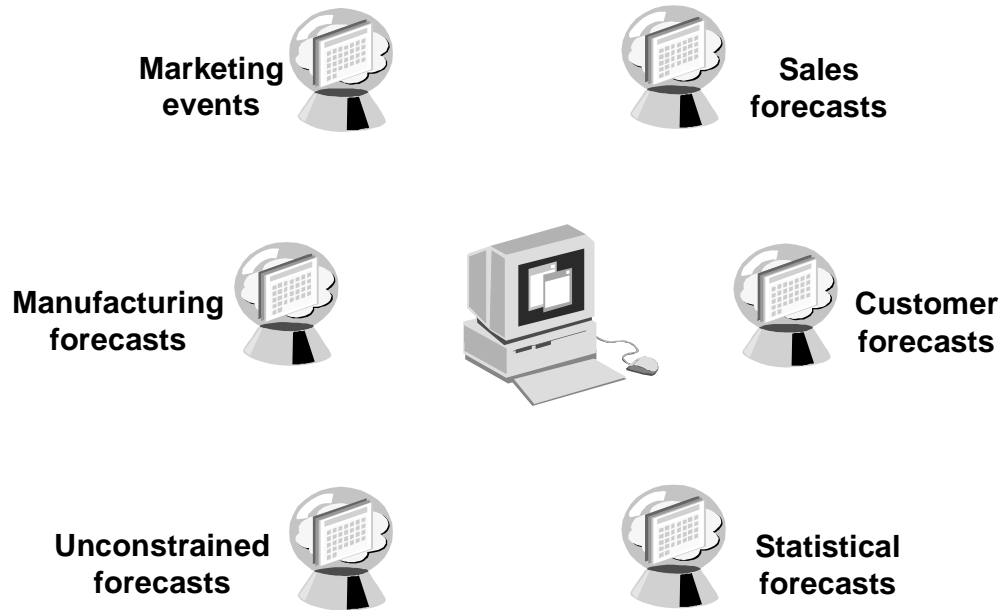
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Forecast Wizard

Oracle Demand Planning has a user-friendly Forecast Wizard that guides the demand planner through step-by-step interactive dialog boxes to help create new forecasts called variants from the original baseline forecast for a particular scenario. These can be published to the planning server as scenarios.

Scenarios



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Scenarios

Users can experiment with different approaches to forecasting, known as scenarios. Scenarios can be created, tested, and discarded as needed. The system is delivered with a set of predefined scenarios:

- Sales Forecast
- Sales Opportunities
- Marketing Events
- Manufacturing Forecast
- Statistical Forecast

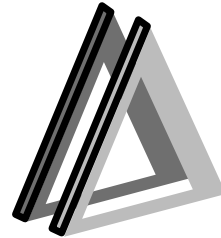
The demand planner can define new scenarios beyond the standard set.

Scenarios are key to improving the forecasts. By comparing scenarios, questions such as the following can be answered:

- How do our forecasts vary from month to month?
- How accurate is the sales forecast?
- Do managers improve forecast accuracy when they override statistical forecasts?
- What amount of lost sales are the result of supply constraints?

Demand Analysis

- **Unconstrained demand forecasts**
- **Constrained supply plans**
- **Resource cost versus lost sales**



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Strategic Questions

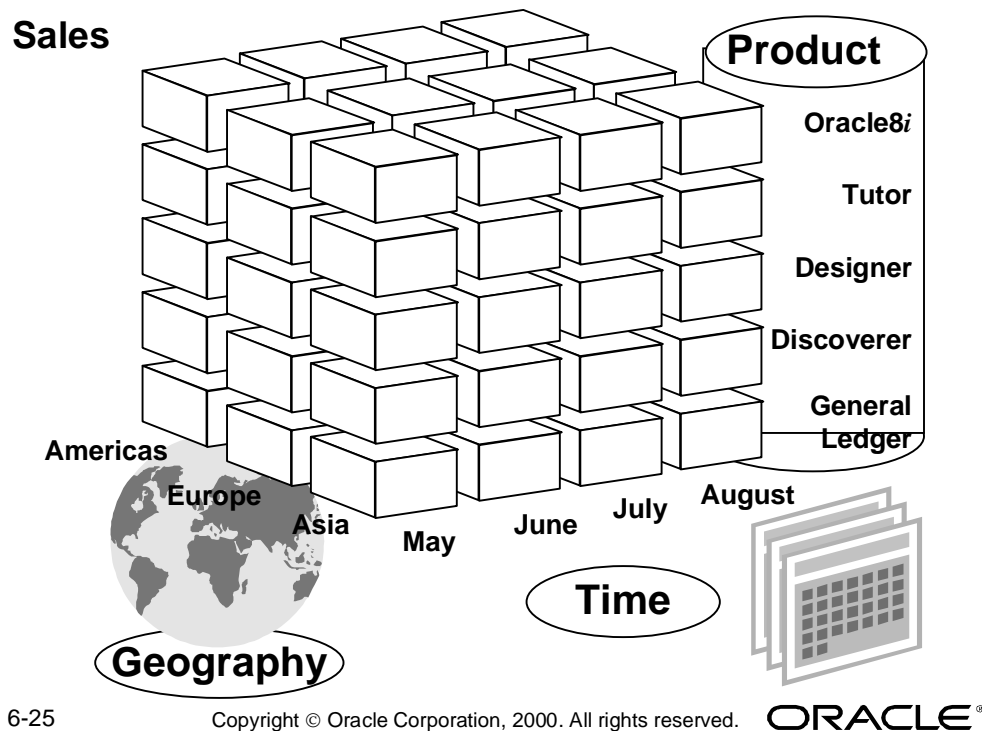
Demand planners generate unconstrained forecasts to estimate market demand as it would occur without the influence of supply constraints and distribution system limitations. Constrained supply plans, by comparison, represent what the producer is capable of delivering. They take into consideration the limitations of capacity, materials, labor, distribution, and other factors.

By having the ability to compare unconstrained demand and constrained supply, producers can look into strategic questions such as:

- Are we producing a product mix that best supports our corporate objectives?
- Would corporate objectives be met if we could supply the unconstrained demand?
- What investment in resources to relieve supply constraints would be justified by the projection of demand?
- Are there regional pockets of unfulfilled demand?
- Is unfulfilled demand the result of production or distribution problems across regions?
- Is the impact of promotions stronger in one region than another?
- Is additional demand pointing to market trends that broadly influence our future?

Finding answers to questions such as these involves analysis. The Oracle Express database provides technology to analyze historical information and to apply that knowledge to demand projections.

Multidimensional Model



Online Analytical Processing (OLAP)

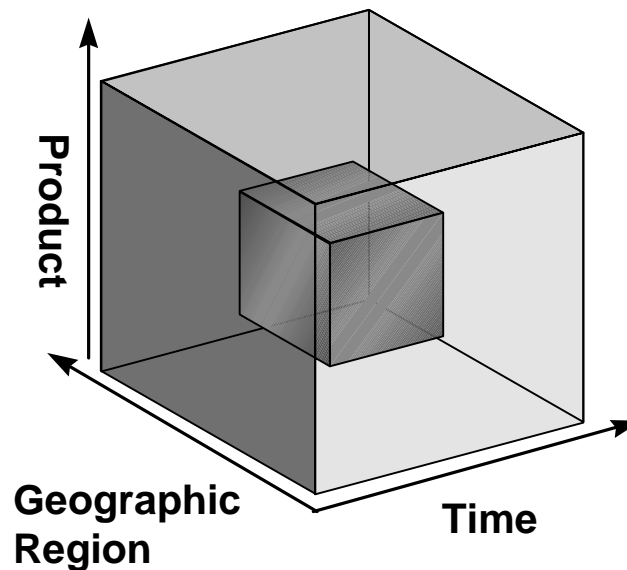
Oracle Demand Planning is based on a multidimensional server and architecture. It enables you to define your own sets of dimensions and your own sets of aggregation. You can define multiple sets of aggregation along all dimensions.

The multidimensional architecture enables analysis along all dimensions without reorganizing the data. It presents the data to you in a way that significant sales trends can be found, whether those trends are in relation to time, product, geographic market, or other dimensions. This enables you to answer questions such as:

- Which products have experienced the most growth?
- What regions are experiencing growth?
- Are some products selling better in some markets than in others?
- Which markets are the most profitable?

Sales management can review and adjust forecasts in monetary amounts, while production management can plan from the same forecasts in units.

Three Typical Dimensions



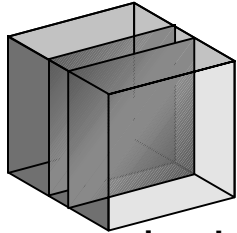
Dimensions

Dimensions define the way data is segmented for the generation, modification, and viewing of demand plans. Oracle Demand Planning contains six predefined demand planning dimensions: Sales Channel, Geography, Ship from Location, Product, Sales Representative, and Time. You can set up two additional user-defined dimensions for a total of eight dimensions.

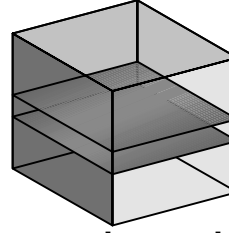
In the ODP system, each demand plan is given a name and description. Each named demand plan can be run in two, three, or four dimensions. Time and Product are mandatory dimensions in all demand plans. That leaves up to two more dimensions that you can choose for each named demand plan. The two, three, or four dimensions that you choose to use in a named demand plan are listed in the Demand Plans window in a column labeled User Dimensions. These are not necessarily the same as user-defined dimensions mentioned in the preceding paragraph. Instead, they are selections of up to four dimensions that the user wants to view in this named demand plan. Again, Time and Product must be included on the User Dimensions list.

One approach would be to select Time, Product, and up to two more dimensions from the list of demand planning dimensions. Another approach would be to collapse several demand planning dimensions into a single user dimension. For example, Sales Channel, Geography, and Sales Representative could be collapsed into the user dimension Geography. To continue this example, the user dimensions could be Time, Product, Ship from Location, and Geography (which represents the Sales Channel, Geography, and Sales Representative dimensions). Using this approach, the demand planner can toggle among the collapsed demand planning dimensions Sales Channel, Geography, and Sales Representative, but will not be able to view them simultaneously.

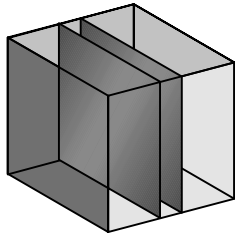
Multidimensional Flexibility



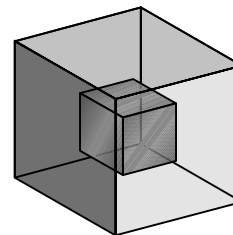
**Compare regional demand
by time and product**



**Compare demand for
different products by
time and location**



**Analyze how sales for a
product and location
change over time**



**Perform ad hoc
querying**

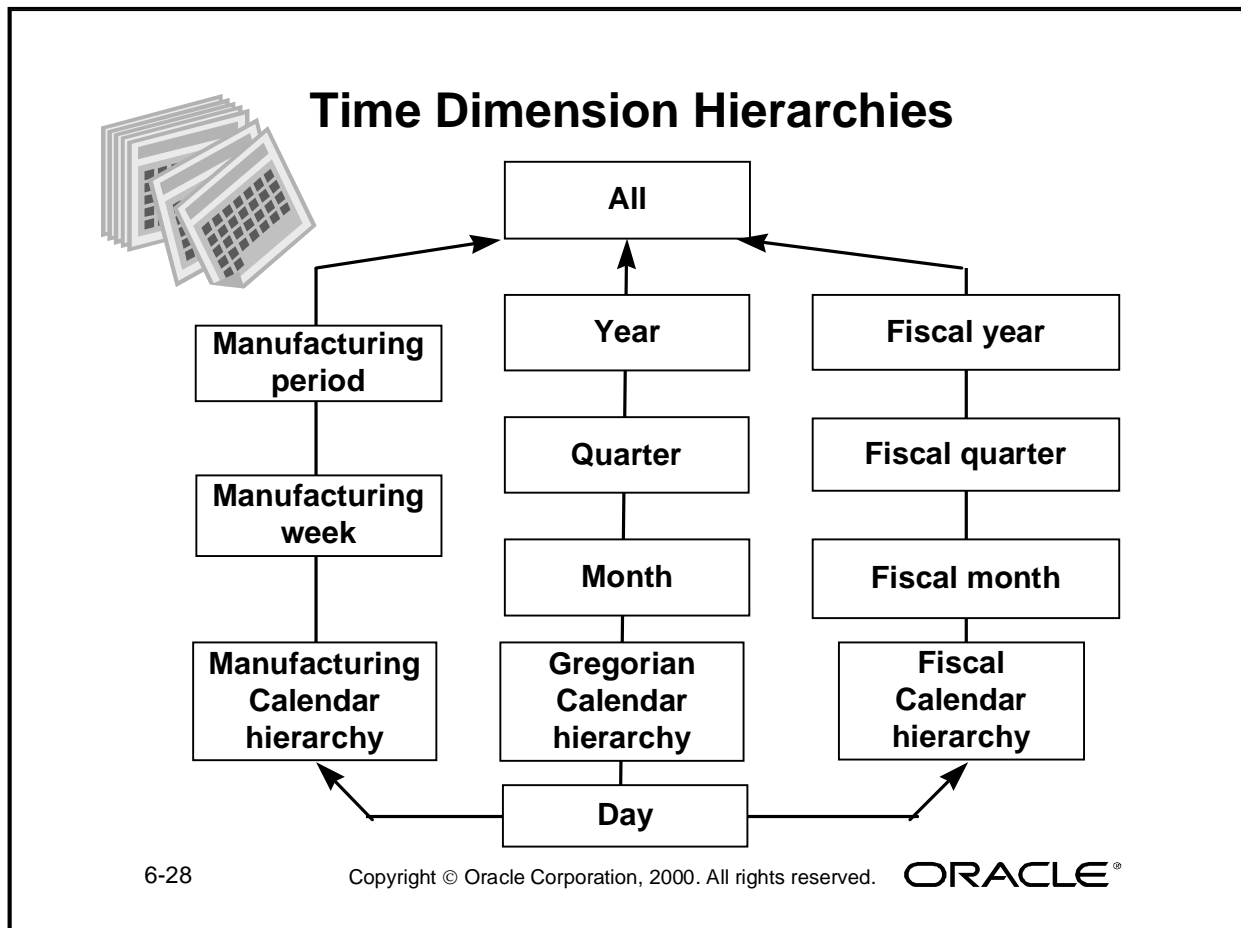
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Multidimensional Analysis

Oracle Demand Planning gives you flexibility to summarize, rotate, and drill down into any dimension for analysis. This enables the analyst to spend more time making business decisions and less time writing queries.

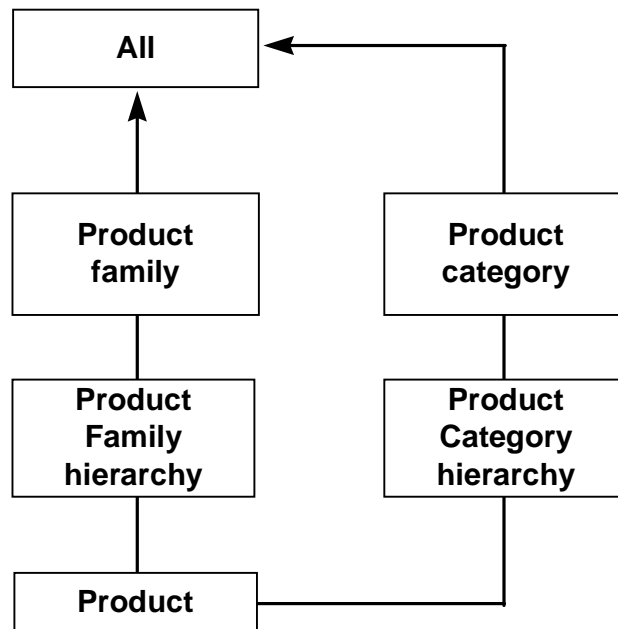
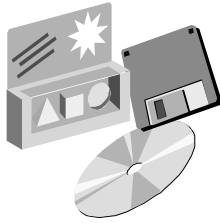


Hierarchies

Dimensions contain hierarchies that are used for aggregating data. Multiple hierarchies can exist for each dimension. You can use one hierarchy for allocation and others for reporting.

In this example, the Time dimension has three hierarchies: Manufacturing Calendar, Gregorian Calendar, and Fiscal Calendar.

Product Dimension Hierarchies



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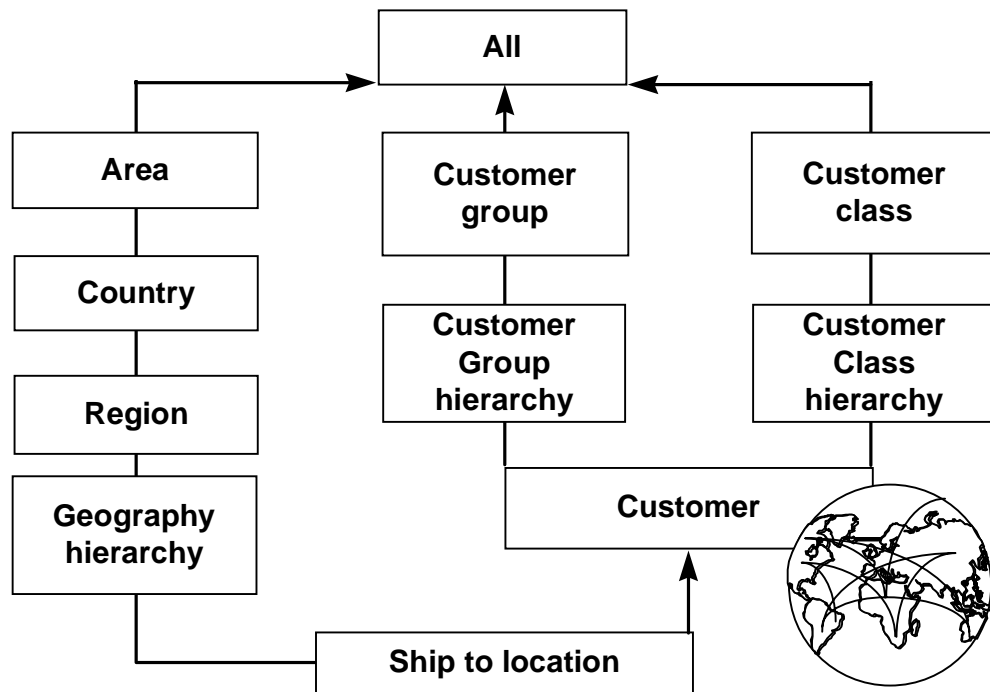
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Product Hierarchies

This example shows the product dimension with two hierarchies: Product Category and Product Family.

Geography Dimension Hierarchies



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Geography Hierarchies

The Geography Dimension has three hierarchies: Geography, Customer Group, and Customer Class.

Demand Planning Roles

- **System Administrator**
- **Demand Planning Administrator**
- **Demand Planner:**
 - **Analyzes and forecasts demand**
 - **Submits scenarios**
- **Demand Planning Manager:**
 - **Reviews and adjust forecasts**
 - **Submits final scenarios**

Demand Planning Roles

- **System administrator:** Responsible for RDBMS and Express administration.
- **Demand planning administrator:** Applying a deep understanding of the business process, determines the overall default settings for the demand planning system. Responsible for assigning data (and resolving conflicts) to individual demand planners, specifying the baseline forecast methods and forecast allocation rules, selecting and setting defaults for the predefined reports, and invoking forecast consolidation after all data from personal databases has been sent to the shared database.
- **Demand planner:** Responsible for analyzing and forecasting demand in an assigned data segment and for submitting a demand forecast corresponding to each scenario for his or her segment of the data. The demand planner is assigned a segment of the shared data by the demand planning administrator. Allocation rules, default settings for predefined reports, and baseline forecasts for each scenario are already completed before the demand planner looks at the data. The demand planner can generate forecast variants and new custom measures and aggregates. He or she can rotate, drill down, or aggregate the data.
- **Demand planning manager:** Responsible for the final forecast numbers for each scenario submitted to the planning server. Once the individual demand planners submit forecasts for each scenario from their personal databases to the shared database, the demand planning administrator invokes the consolidation process to obtain a consolidated forecast. The demand planning manager reviews the consolidated forecast for each scenario and decides whether to accept or reject it. The demand planning manager could modify the forecasts or ask the demand planning administrator to reassign them to the demand planners.

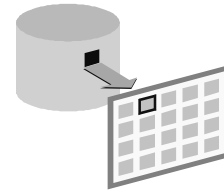
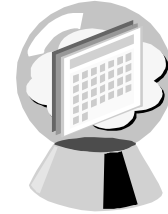
Demand Planning Setup Steps

System Administrator:

1. Set up instances.
2. Create database links.

Demand Planning Administrator:

3. Create dimension definitions.
4. Create demand plan definitions.
5. Define scenarios.



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Demand Planning Setup Steps

System Administrator: The system administrator sets up the database instances and links used for data collection.

Demand Planning Administrator: The demand planning process begins with some important initial setup that is not routinely repeated. This includes creating dimension definitions that state the hierarchy level structures within dimensions. A hierarchy is an ordered set of levels used for aggregation and navigation. Demand plan definitions state the hierarchies to be forecasted within dimensions. Scenarios define the type of history, the forecast horizon, and the forecast period type to be used for the demand plan.

Demand Planning Process Steps

Demand Planning Administrator:

6. Run collection programs to:

- Load interface tables.
- Load data into Oracle Express database.

7. Calculate statistical forecasts and evaluate results against exception criteria.

8. Assign data to users, generate reports, and notify users.



Demand Planning Process Steps (continued)

Demand Planning Administrator: (continued) Routine steps for the demand planning administrator include launching a concurrent program to load interface tables with level values and fact values. Data associated with the forecasting scenario and stored in the planning server is first loaded into interface tables, where the integrity of the data is checked before the data is loaded into the Oracle Express database. The Express link to the planning server performs this step.

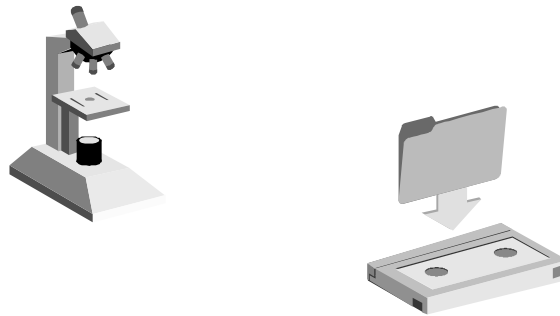
Calculating the statistical forecast involves running the forecasting engine. Automated algorithms are applied to historical data, resulting in demand projections. Upon completion, forecast results are evaluated against the exception criteria, reports are generated, and users are notified.

Demand Planning learns the definition of users and roles from the application server. This information can then be used to assign forecasting responsibilities to users. The responsibilities can be assigned based on information from multiple dimensions. The multidimensional architecture enables users to assign responsibility and accountability at appropriate levels. For example, marketing can assign forecasting and forecast accuracy responsibility to product managers by product line, while sales can assign accountability by region or territory. Typically, the assignments are made by a combination of product focus and geographic area. For instance, one person may be responsible for forecasting demand for Brand A in Europe while another is responsible for forecasting Brand B in Asia. When a user is assigned to a particular level in the hierarchy, the user has access to all levels below that particular level in the hierarchy. To provide more granularity, you can specify a value at that level for which the user is responsible.

Demand Planning Process Steps

Demand Planners:

9. Analyze and adjust forecasts.
10. Save forecast scenarios to a shared server.



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Demand Planning Process Steps (continued)

Demand Planner: The statistical forecast is based on historical demand patterns. The forecast analysis step can result in several adjustments based on marketing plans, sales and customer plans, manufacturing forecasts, and managerial review.

All people responsible for developing a part of the forecast can save their work across forecasting work sessions in an area available only to them. When they decide which forecast best reflects their market, they submit it to the system.

During this step, the demand planner can:

- View statistical and baseline forecasts for a particular product
- Specify statistical forecasting methods for generating alternative personal forecasts
- Manually adjust the forecast to create alternative personal forecasts
- Choose which personal forecast to submit as the final adjusted forecast
- Enter event, promotion, and cannibalization coefficients that represent a percent change to be applied to the statistical forecast. Values can be negative or positive.

Demand Planning Process Steps

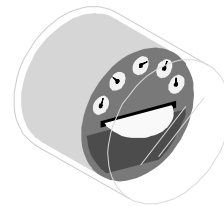
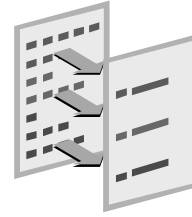
Demand Planning Administrator:

11. Consolidate forecasts.

Demand Planning Manager:

12. Perform managerial review of forecasts.

13. Submit final forecasts to the planning server.



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Demand Planning Process Steps (continued)

Demand Planning Administrator: You can use workflow notification to direct and coordinate the effort of collecting forecasts from all contributors. After the consolidation engine combines and organizes the information, the forecasts are available for managerial review.

Demand Manager: During the review process, the planning manager can make further adjustments to the integrated forecast before releasing it to drive the production planning and scheduling programs. Final forecasts are submitted to the planning server.

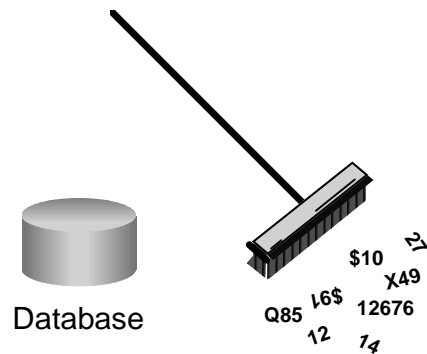
An often neglected, but essential step to improved forecasting is to track the forecast errors. Forecasts always contain some error variance, but some processes result in more bias or greater errors than do others. In this step, you review the forecast accuracy report to ensure that your forecasting process remains in control. Alerts can be set to flag out-of-control conditions.

Transaction System Note: The current ODP process calls for forecast consumption to occur on the transaction (source) side. Named forecast scenarios published to the transaction system are linked to forecast sets. Forecast consumption occurs once within a forecast set. Forecasts are used in master demand schedules. Then master demand schedules are collected and loaded into the Advanced Planning and Scheduling system to create a supply plan matching the demand plan.

Demand Planning Process Steps

Demand Planning Administrator:

14. Clean up the database and prepare for the next round of planning.



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Demand Planning Process Steps (continued)

Demand Planning Administrator: The final step is to prepare for the next cycle. This step can best be thought of as preparing the Demand Planning database for the next round of planning. You can decide whether any of the analyses defined in the previous planning cycles should be retained. At this time, you can review the database and determine whether the data is still needed.

Summary

In this lesson, you should have learned how to:

- **Explain features and benefits of Oracle Demand Planning (ODP)**
- **Describe demand planning roles and processes**

Summary

Oracle Demand Planning assists in the process of creating forecasts. It uses an Internet-based framework to capture demand from all sources, resulting in more accurate forecasts, reduced safety stock requirements, and better planning.

In addition to having all of the features required to create accurate forecasts, Oracle Demand Planning has the following key differentiators:

- Pure Internet-based solution
- Full backward compatibility
- Single-source data integration
- Powerful multidimensional analysis capability
- Proven Geneva ATSF engine
- Support for multiple units of measure
- Multiple scenario comparison

The process of creating a new forecast is made easy through interactive dialog boxes using the Forecast Wizard.

7

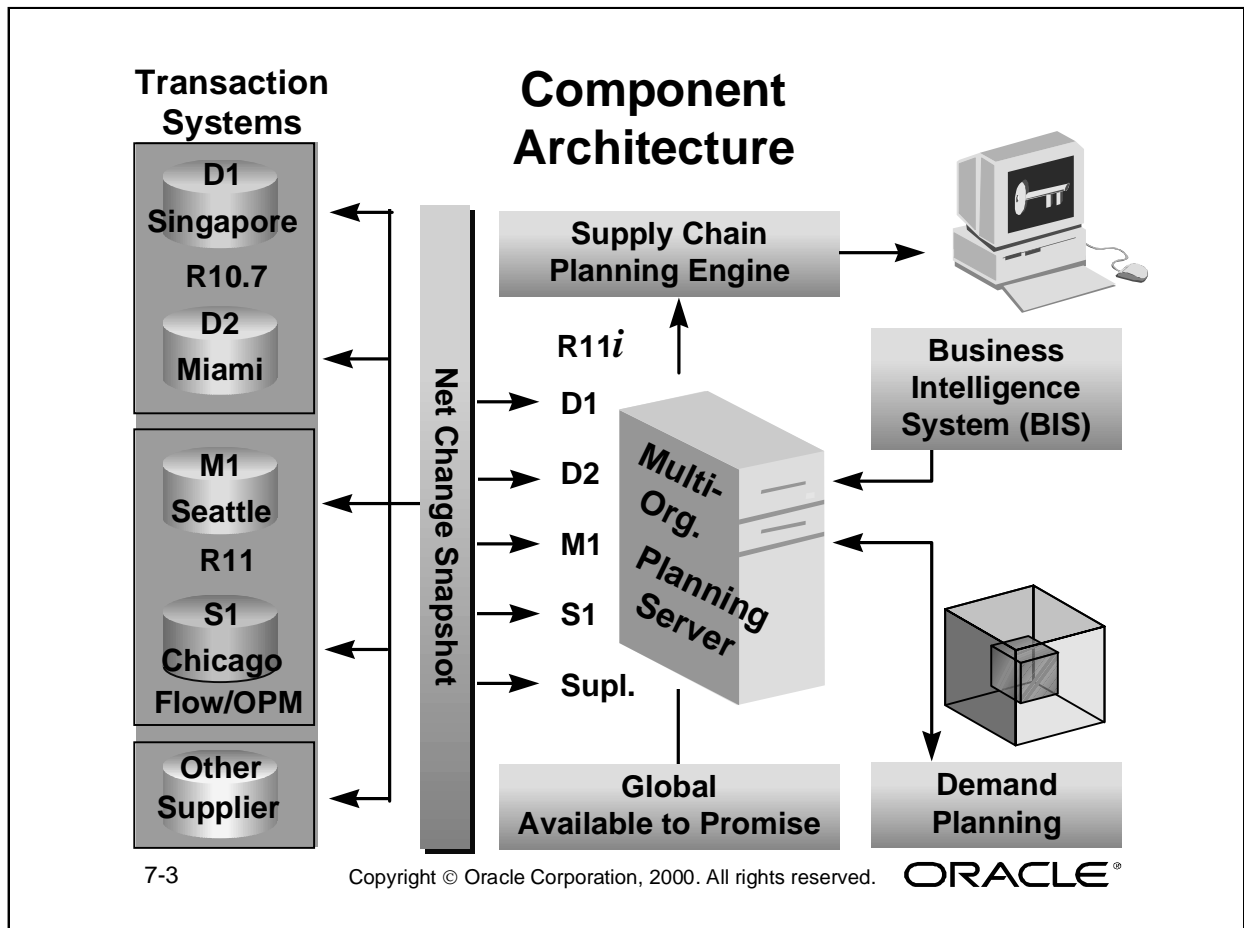
Transaction System Data Collection

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Objectives

After completing this lesson, you should be able to do the following:

- **Set up instances for collection**
- **Set up data collection frequency**
- **Launch the data collection programs**
- **Use the Collection Workbench to validate data**

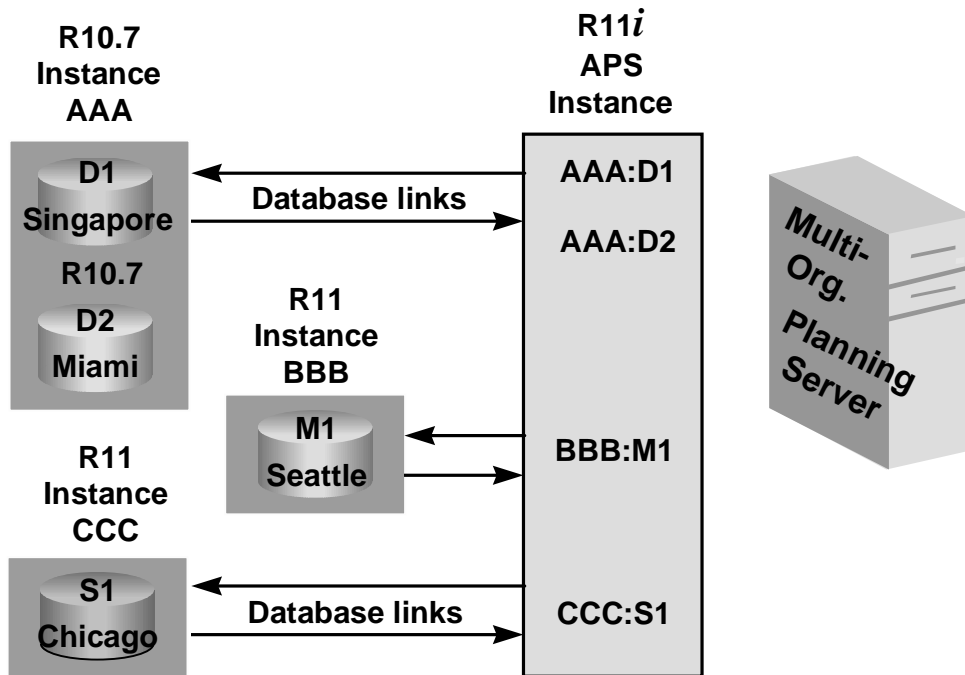


ASCP Features: Component Architecture

Implementation of the Advanced Planning System need not disrupt the existing transaction systems operations. The user has great flexibility in determining when a snapshot of information from the transaction (source) system should be taken, and in deciding what information to capture with each job. The data collection program can be set to run upon submission of a job request, and at specified time intervals, and to collect different types of information with different frequency. For example, dynamic data such as sales orders can be collected frequently, while static data such as department resources can be collected at longer intervals. The objective is to set up data collection as needed to create a reasonably current replica of information for the APS system to use in its model. To a degree, this is a self-balancing decision. In the incremental refresh (net change) mode, the collection program can detect and collect only changed data. Collecting data more frequently results in less work during each collection. On the other hand, there is little point in collecting any type of data more frequently than the time it takes to calculate a plan, because at the time the planning job completes, all of the data will be at least as old as the job run time.

The figure shows the recommended configuration, where a separate planning server captures a snapshot of the data from the transaction systems. The supply chain planning engine performs multiorganization planning and simulation calculations without affecting transaction server resources. Results of supply chain optimization are published back to the transaction systems.

Instance Name: Organization Code



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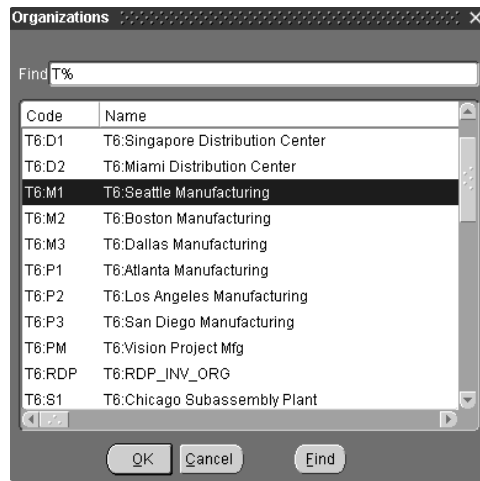
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APS Organization Code Instance Tag

You can collect data from multiple and prior release instances for use by release 11i APS. The organization codes defined on the APS side include reference to the source instance name. In the figure, the transaction system for the distribution centers D1 and D2 are shown to be operating on a release 10.7 instance named AAA. Using a database link, the data collection program obtains information about organization D1 from the release 10.7 and then brings that information to the release 11i planning server organization AAA:D1. Another database link is used when ASCP plan information for organization AAA:D1 is published back to the transaction system organization D1 on instance AAA.

APS Organizations



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Navigator

(N) Advanced Planning and Scheduling—>Other—>Change Instance/Organization

Changing Organizations

Changing organizations within the Advanced Planning and Scheduling portion of the Navigator window is slightly different from changing organizations in other areas of the Navigator. In the Change Instance/Organization window, your selection indicates both an instance and an organization within that instance. The instance: organization selected is the “owning” organization. When an ASCP plan involves several supply chain organizations, all of the organizations can be viewed from the owning organization.

Data Collection Steps

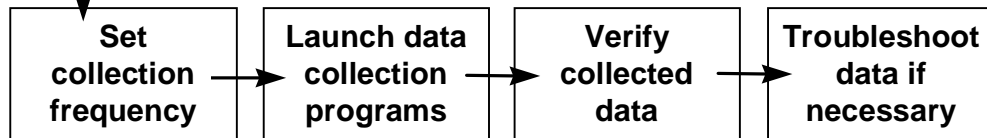
Transactional instances setup:



APS instance setup:



Data collection process:



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Transactional (Source) Instances

For Oracle customers who use Oracle Planning release 10.7 or later, the planning setup data, such as items, routings, and bills are ready to copy.

For Oracle customers who use Oracle Supply Chain Planning release 10.7 or later, the supply chain setup data, such as sourcing rules, bills of distribution, and assignment sets are also ready to copy.

Depending on the extent of the supply chain characteristics you want to model or optimize, you may need to enter additional information in flexfields.

APS (Destination) Data

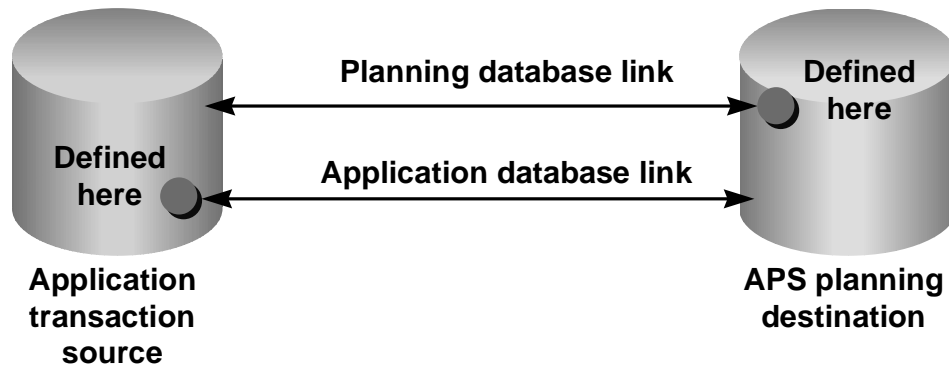
The Oracle APS setup for data collection involves three steps:

- Define instances
- Establish database links
- Specify parameters for the data to be collected from each instance for each named request set.

Data Collection Process

- Different request sets can be run as soon as possible, one scheduled time, at periodic intervals, or on specific days.
- Launch data collection programs across specified source instances: 10.7, 11.0, 11i, OPM.
- Use the Collection Workbench to verify that the intended data has been collected.
- If necessary, troubleshoot errors in data collection and rerun the data collection program.

Database Links



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Database Links

The Planning Database Link is defined by the database administrator on the APS planning (destination) instance; the Application Database link is defined by the database administrator on the transaction (source) instance. Both links are bidirectional.

The Planning Database link is used for:

- Data collection from transaction source to the planning instance (from left to right in the figure)
- When an action such as releasing a planned order or requisition occurs in the APS planning system, the data is “published” to the transaction server. The first step in this process is to send a signal via the Planning database link to the transaction instance. This initiates a remote procedure that pulls the planned order or requisition record from the planning instance to the transaction instance.

The Application Database link is used to complete the publishing process: the remote procedure that pulls the planned order or requisition record from the planning instance to the transaction instance does so using the Application Database link.

Setting Up Instances

Instance Code	Instance Type	Version	Application Database Link	Planning Database Link
T6	Discrete	11i		
T	Discrete & Process	11i	TST115	TST115

Application Instances

(N) Advanced Planning and Scheduling—>Setup—>Instances

Setting Up Database Instances

The database administrator uses this form to set up instance names and to specify the release version of the source database, application database link, and planning database link associated with the instance names. The figure depicts a somewhat unusual situation where both the application and APS planning instances are located on the same server.

Note: Even when all transaction instances and the APS instance are located on one server, you still must run data collection.

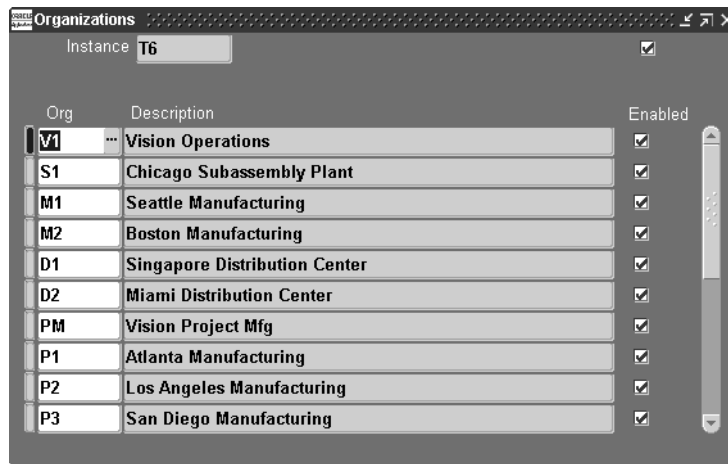
Instance Types

- Discrete
- Process
- Discrete and Process
- Other

Other Instance Setup

In other fields not displayed in the figure, you enable the instance with an Enable check box. In the GMT Difference field, you can specify the number of hours for the time zone difference between your location and GMT. In the Currency field, you enter the currency unit of measure for the source instance.

Organizations



Organizations

(N) Advanced Planning and Scheduling—>Setup—>Instances (B) Organizations

The Organizations window lists the organizations within the instance. To enable data collection for an organization within an instance, select the Enabled check box.

Data Collection

Program	Stage	Parameters	Language
Planning Data Pull	Data Pull	T6:Yes:2:US:Yes:Yes:Yes:Yes	American English
Planning ODS Load	ODS Load	T6:3:No:No	American English

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Planning Data Collection

(N) Advanced Planning and Scheduling—>Collection—>Data Collection

Defining a Data Collection Request Set

You use this form to name request sets. Each request set includes a list of programs to run. In the figure, the programs named Planning Data Pull and Planning ODS Load are listed. Therefore, launching this request set will cause two programs to run.

Note: You can collect from only one instance with each request set.

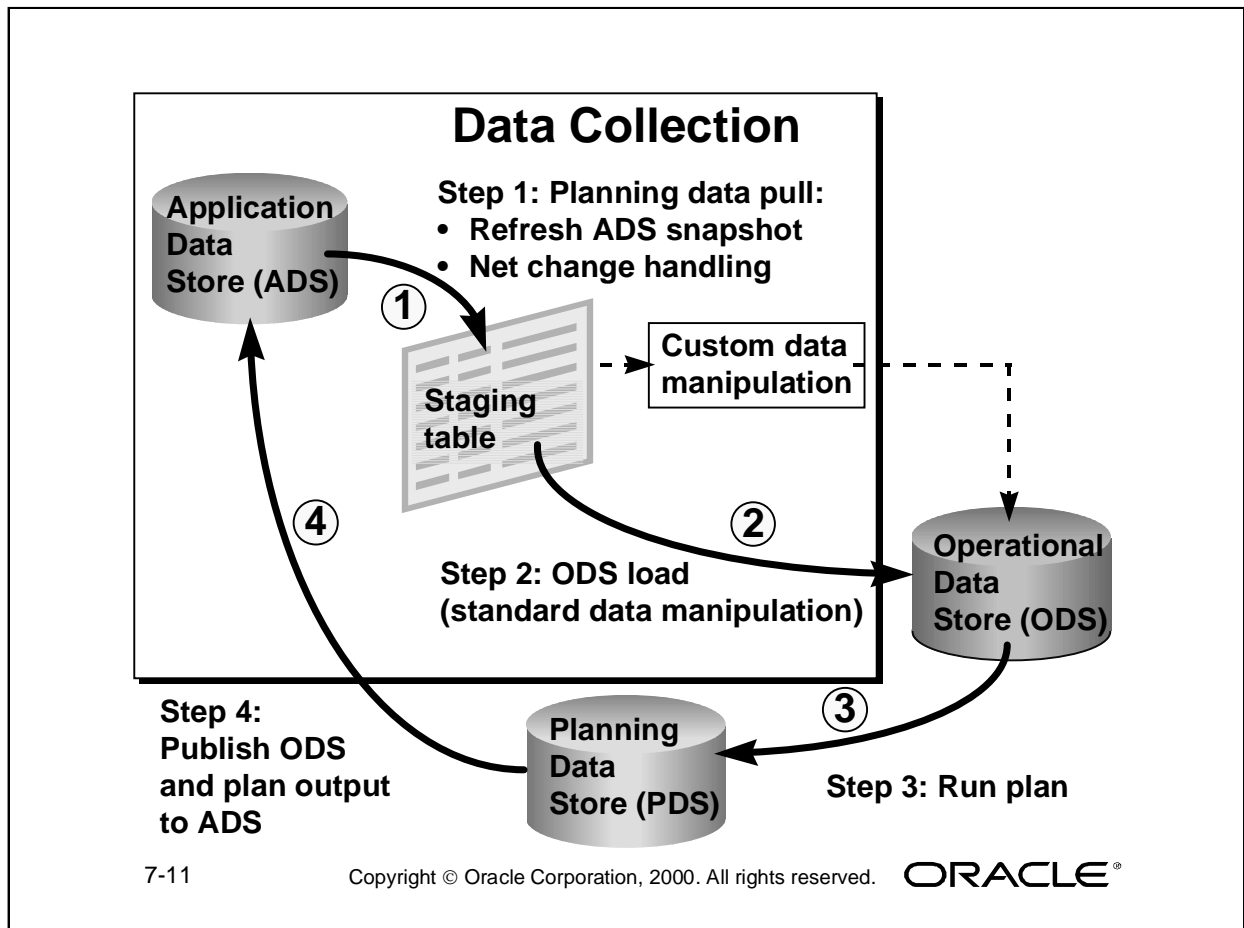
The Planning Data Pull program is a registered application object library (AOL) concurrent program. The Planning Data Pull program collects information from the application data store (ADS) repository and stores the data in staging tables.

The ODS Load program performs the data transformation and moves the data from the staging tables to the operational data store (ODS) repository. Procedures enable data cleansing, data collection, and data communication among these data repositories.

There is no other indication to the user of the fact that two programs run when this request set is launched. Also note the Parameters column of the form.

- When you click in the Parameters column in the Planning Data Pull program row, the Data Pull Parameters window opens.
- When you click in the Parameters column in the ODS Load program row, the ODS Load Parameters window opens.

Note: If you use a custom program to manipulate data stored in the staging tables before it is loaded into the ODS repository, you list that program between the other two programs shown on this form.



Collection and Publishing Processes

Step 1: The planning data pull program collects data from the source instance application data store (ADS) and loads the staging table.

Note: If the transaction system is a legacy system, you would write your own data pull program to load the staging table.

Step 2: The ODS load program uses standard data cleansing methods and moves the data to the operational data store (ODS). If you use a custom program to manipulate data stored in the staging tables before it is loaded into the ODS repository, the custom program would run before the ODS load program.

Example for use of a custom program: In one instance a supplier's name is IBM and in another instance the same supplier's name is I.B.M. The custom program would resolve the difference.

Step 3: APS planning results are stored in the planning data store (PDS).

Step 4: When an action such as releasing a planned order or requisition occurs in the APS planning system, a concurrent process causes the record to be pulled from the PDS to the ADS.

Planning Data Pull Parameters

Parameter	Value
Instance	
Complete Refresh	Yes
Number of Workers	2
Language	US American English
Pull Items	Yes
Pull Suppliers	Yes
Pull Customers	Yes
Pull BOM/Routing	Yes
Pull Reservations	No
Pull Sourcing Rules	Yes
Pull Work in Process	No
Pull Safety Stock	No
Pull Purchasing Supply	No
Pull On Hand	No
Pull Approved Supplier List	Yes
Pull UOM	Yes
Pull MDS	Yes
Pull MPS	No
Recalculate NRA	No
Recalculate Sourcing History	No



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Parameters

(N) Advanced Planning and Scheduling—>Collection—>Data Pull—>Parameters

Selecting Data to Be Collected

In the Data Pull Parameters window, you specify which data to retrieve from this instance when you run this program request set. In the figure, at the top of the form the instance name is blank, but the name of the instance for this data pull ordinarily would appear here.

The figure shows that this data pull will be performed in the complete refresh mode (Complete Refresh = Yes). The Complete Refresh flag works in conjunction with the other data Yes/No flags listed lower on this same form. When Complete Refresh is set to Yes, *all* of the original data in the operational data store (ODS) will be purged. Then the data types that have flags set to Yes are collected and inserted into the ODS.

For example: Complete Refresh = Yes, Pull Items = Yes, Pull BOM/Routings = No.

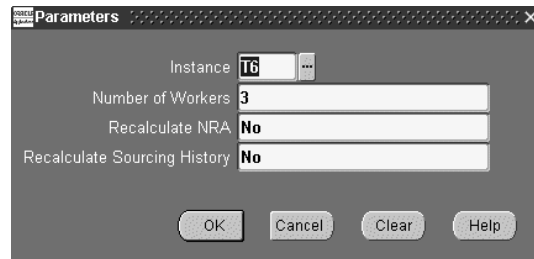
After the data collection, the ODS will contain items but no information about bills or routings.

When Complete Refresh is set to No, then the data collection is performed in incremental refresh mode (net change). The data existing in the ODS is not purged. The data types that have flags set to Yes will be refreshed.

For example: Complete Refresh = No, Pull Items = Yes, Pull BOM/Routings = No.

After the data collection, the ODS will contain refreshed item information and the same bills or routings information that existed before the incremental refresh occurred.

ODS Load Parameters



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Parameters

(N) Advanced Planning and Scheduling—>Collection—>Data Pull—>Parameters

ODS Load Parameters

In the figure, at the top of the form the instance name is T6. This is the source instance.

In the ODS Load window you specify the number of workers to employ. The number of concurrent workers to employ for this program is three.

In the figure, the Recalculate NRA and Recalculate Sourcing History fields have been turned off.

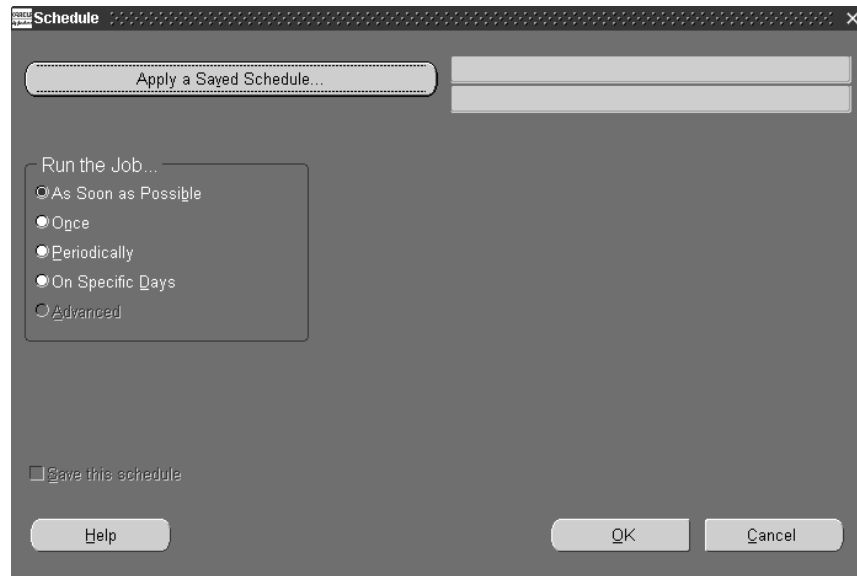
Recalculate NRA

Availability over time for all resources is stored on the planning (destination) server in a net resource availability table. In constrained or constrained and optimized planning, Oracle ASCP uses information from this table to ensure that the ratio of workload to resource availability in all time buckets is less than one. If a new resource is defined or the availability of a resource has changed on the transaction (source), then the Recalculate Net Resource Availability (NRA) field on the Data Collection Parameters window should be set to Yes to collect information needed to rebuild the net resource availability table.

Recalculate Sourcing History

You can choose to allow sourcing history to affect allocation of orders among external supply sources. Setting the Recalculate Sourcing History flag to Yes will cause the sourcing history to be recalculated.

Set Data Collection Frequency



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Schedule

(N) Advanced Planning and Scheduling—>Collection—>Data Collection (B) Schedule

Data Collection Flexibility

Within the same instance, users can set different collection frequencies for different data within the instance. For example, BOMs and routings can be set to collect every week, while sales orders and forecast can be set to collect every 12 hours.

Named request sets permit data to be collected from the same instance:

- At different frequency
- With different data parameters

You can collect different data within the same instance at different intervals.

Launch Data Collection

Run this Request... Copy...

Request Set **Planning Data Collection**

Program	Stage	Parameters	Language
Planning Data Pull	Data Pull	T6:Yes:2:US:Yes:Yes:Yes:Yes	American English
Planning ODS Load	ODS Load	T6:3:No:No	American English

At these Times... **As Soon As Possible** Schedule...

Help (A) Submit Cancel

Note: Submitted request set. (Request ID = 818972)

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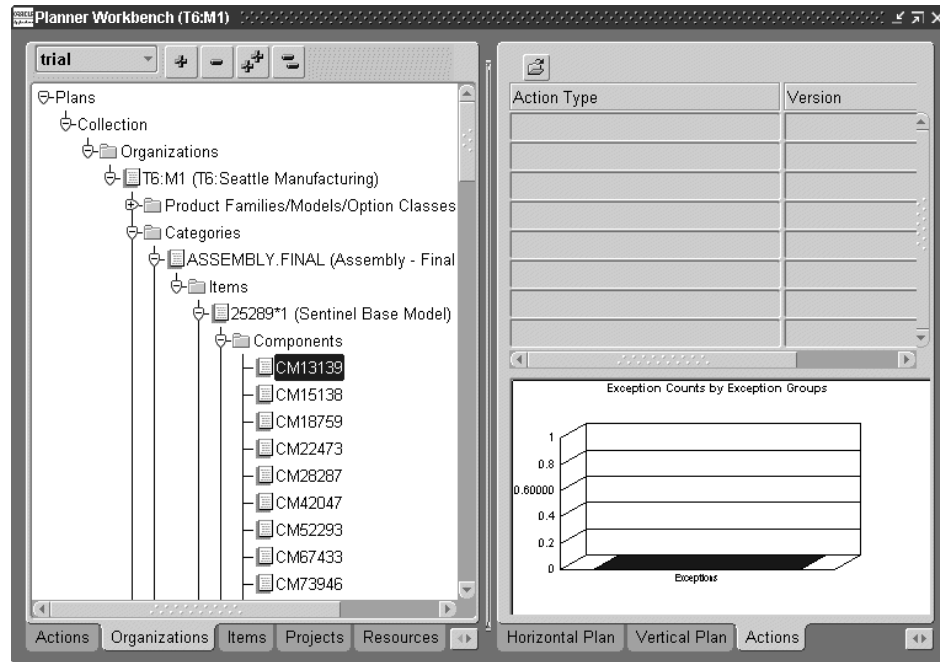
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Planning Data Collection

(N) Advanced Planning and Scheduling—>Collection—>Data Collection (B) Submit

To submit your data collection request, click the Submit button.

Verifying Data Collection



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Collection Workbench

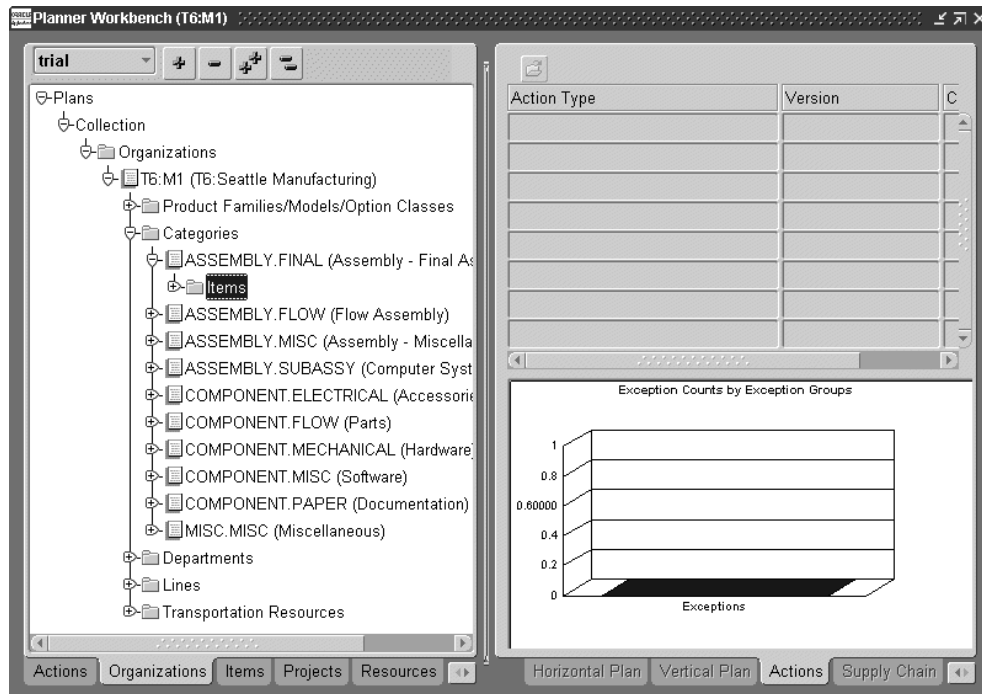
(N) Advanced Planning and Scheduling—>Collection—>Workbench

Verifying Collected Data

Open the Collection Workbench window. In the navigation tree, select the Organizations tab in the left window pane and select the Actions tab in the right window pane. The root of a tree will appear on the Organizations tab. In the figure, the tree was expanded by clicking the plus (+) signs to open Plans, Collection, Organizations, Categories, Final Assemblies, Items, Sentinel Base Model, and Components. Highlighted in the display is CM13139, a component of the Sentinel Base Model, which is an item belonging to the final assembly category in the Seattle (M1) organization of instance T6 that has been collected.

The Actions tab has been selected on the right side of the Collection Workbench window. Since a plan has not yet been generated from the collected data, no actions have been suggested for CM13139. After the planning program has run, you will use a similar graphical user interface, the Planner Workbench, to view and act upon action messages. Also on the Planner Workbench, you can open the plan portion of this tree, and then view and compare key performance indicators for alternative named plans.

Verifying Data Collection



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Verifying Collected Data (continued)

This figure shows the tree prior to expanding the Items folder. Now visible are other types of information that have been collected, such as information about departments and flow lines. As one would expect, when the Department folder is opened, the display lists departments, then resources within departments, then items located within the resources, then components of the items, then suppliers of the components, and so on.

Search Window

Search Window

Basic | Advanced

Plan: Org:

Item:

Category:

Department:

Resource:

Supplier:

Clear Open Query... Delete Query... Search

Product Family	Item	Component	Supplier	Dept

Save As... Apply OK Cancel

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Search

(N) Advanced Planning and Scheduling—>Collection—>Workbench (M) View—>Find
A search window allows you to quickly locate specific collected information.

Summary

In this lesson, you should have learned how to:

- **Set up instances for collection**
- **Set up data collection frequency**
- **Launch the data collection programs**
- **Use the Collection Workbench to validate data**

Practice 7-1 Overview

This practice covers completing Part IV of the APS case study:

- **Naming an instance**
- **Associating organizations with an instance**
- **Setting data collection parameters**
- **Launching data collection programs**
- **Verifying data collection**

Performing Practice 7-1

For detailed instructions on performing this practice, see Part IV in Appendix B, “Case Study.”

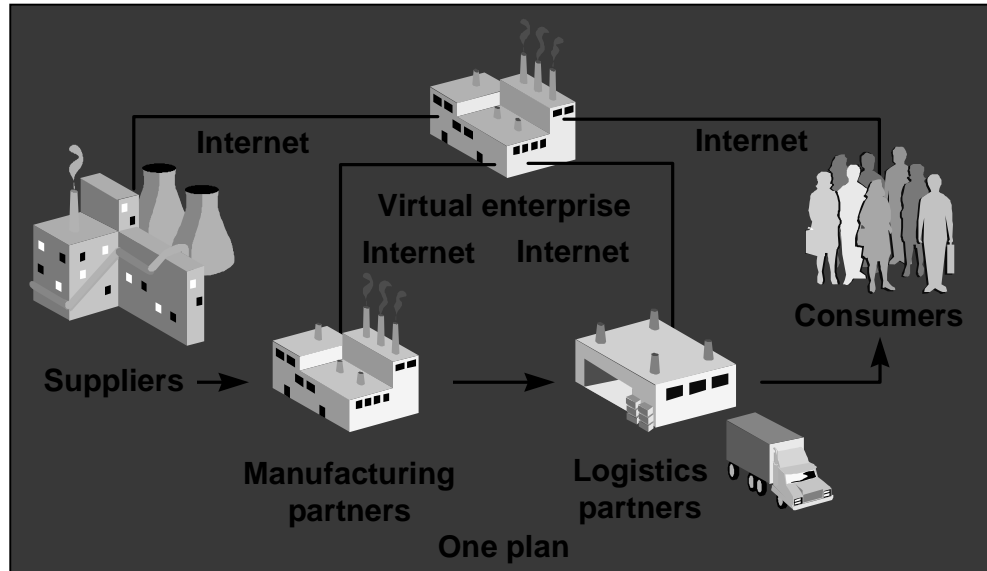
8

ASCP Overview

Objectives

After completing this lesson, you should be able to discuss ASCP features and benefits.

Holistic Planning, Scheduling, and Optimization



8-3

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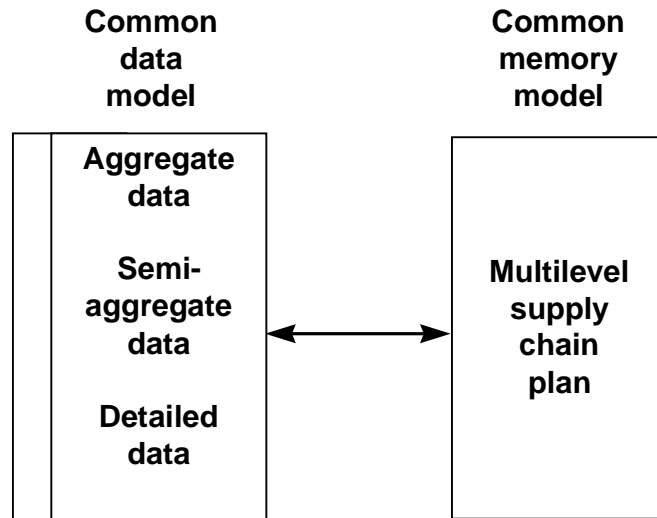
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Holistic Planning, Scheduling, and Optimization

Oracle ASCP is the only system that enables a company to plan, schedule, and optimize the entire supply chain within a single plan for:

- All supply chain locations
- All time horizons
- All manufacturing methods
- All materials and resources

Common Data Model



8-4

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Common Data Model

Oracle Advanced Supply Chain Planning and Oracle Applications share a common data model for planning and execution since high-level planning and detailed scheduling are the same process, there is only one memory model.

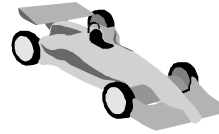
Benefits

With Oracle Advanced Supply Chain Planning, there is no redundant supply chain setup. You never see more than one model of bills, routings, items, bills of distribution, sourcing rules, and so on. The same sourcing rules that choose supply sources in Oracle Purchasing and ATP are reused by Oracle Advanced Supply Chain Planning to define the supply chain sourcing relationships. This drastically reduces the time that it takes to implement the APS solution, leading to much faster return on investment.

This also reduces the ongoing maintenance costs by eliminating redundant data entry and by eliminating the problem of keeping multiple representations of your business data synchronized. This provides higher data integrity and lower cost of ownership.

Benefits of Common Data Model

- **Quick implementation**
- **High data integrity**
- **Fast planning cycle**
- **Better system performance**



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Benefits (continued)

Oracle ASCP combines many elements of planning that have historically forced companies into multiple-step planning processes, resulting in longer planning cycles and multiple plans to reconcile. The common data model eliminates the following processes:

- Reconciling short-, medium-, and long-term plans
- Consolidating plans for multiple organizations into one plan

Oracle ASCP delivers faster planning cycles by combining the following capabilities into one integrated planning engine:

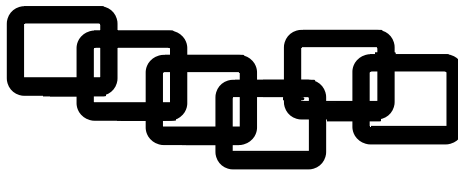
- Internal, customer, and supplier locations
- Distribution and manufacturing planning
- Material planning at the item or product family level
- Capacity planning at the resource or aggregate resource level
- Long range planning and detailed scheduling
- Optimization and constraint-based scheduling

The common data model enables:

- One virtual enterprise-wide plan generated across all resources, materials, manufacturing methods, time horizons, and locations
- Plans optimized to global objectives
- What-if simulations to run quickly

ASCP Features

- **Plan across organizations to meet global objectives**
- **Plan all or a portion of the supply chain**
- **Rapid one-step supply chain planning**



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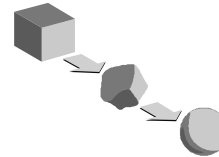
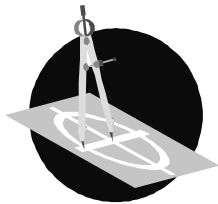
ASCP Features

- **Global objectives:** You can generate multi-organization material and resource requirements plans:
 - To optimize performance for the supply chain as a system rather than planning to local goals
 - That do not exceed the availability of materials and resources anywhere in the supply chain
- **Vertical and horizontal strategies:** You can model the complete supply chain, including external partners. In situations where some supply chain partners require their own locally controlled production plans, you can plan the other portions of the supply chain to work around specific supply schedules taken as given input. You have the ability to:
 - Specify the set of facilities and their relationships within your supply chain
 - Generate optimal plans for these facilities as a system
- **Rapid one-step planning:** You can perform rapid one-step planning of multiple facilities in your supply chain:
 - Third-generation memory-based planning engine
 - Simultaneous, synchronized high-level planning and detailed scheduling
 - Integrated planning and execution
- **Planning outcome includes:**
 - Planning decisions that optimize your global business objectives
 - A set of supply schedules for each planned facility

Oracle Advanced Planning and Scheduling R11i 8-6

ASCP Features

- **Production planning**
- **Perform sourcing decisions**
- **Peg supply and demand**
- **Plan engineering changes**

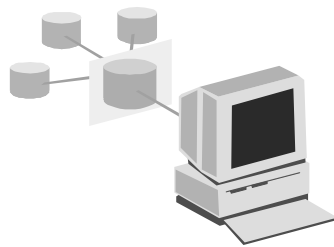


ASCP Features (continued)

- **Production planning:** The supply chain optimization module generates tactical sourcing decisions that optimize your objectives and determine the supplies that must be created in each time period to fulfill the demands. You can model demands, supplies, and other material and resource information at different levels of detail in different time periods to facilitate efficient generation of plans.
- **Transportation constraints:** As part of the supply chain plan, you can specify constraints for your transportation network in the form of transportation capacity by shipping method, weight, and volume. You can also specify transportation lead times by shipping method. You can cause the optimization calculation to evaluate alternative transportation methods to achieve on-time delivery objectives.
- **Make sourcing decisions:** You can define sourcing rules to specify the sourcing percentage and priority for sources of supply. The planning engine will generate sourcing decision messages according to these rules to determine the time-phased flow of materials in your supply chain.
- **Pegging supply and demand:** You can view full pegging information outlining the exact sequence of supply transformations that are required to fulfill your demand. Purchasing activities, work-in-process job creation, and completion and movement of supply are specified. Pegging information is available at the level of aggregation specified for your time buckets, items, and demands.
- **Plan engineering changes:** You can model revisions and engineering constraints for the items in your plan. You have the ability to specify ECO effectivity in the form of effective dates, use-ups, model and unit numbers and specific projects and tasks.

ASCP Features

- **Flexible time granularity for planning and scheduling**
- **Plan product families**
- **Plan aggregate resources**

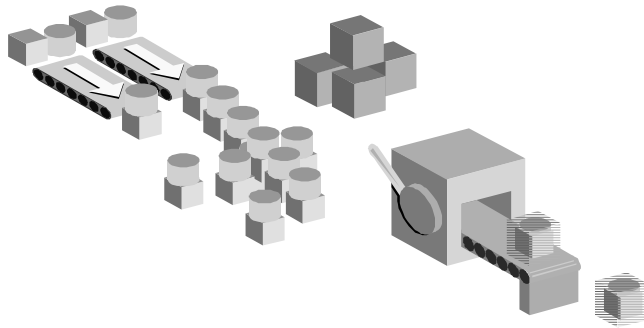


ASCP Features (continued)

- **Flexible time granularity:** Within short-, medium-, and long-range planning horizons, you can define different degrees of time granularity for planning and scheduling. This provides the ability to:
 - Perform high-level planning as well as detailed scheduling within one plan
 - Plan for material and resource availability at aggregate and individual levels of detail
 - Plan for material and resource availability in nonuniform time periods
- For example, you can calculate near-term finite schedules stated in time increments of minutes, hours, or days. The finite schedule states how you intend to accomplish the work load, given the specific material and resources that you know exist today or will exist during the next few days or weeks. Within the same calculation, you can make daily or weekly operational plans that observe resource constraints in the aggregate, but assume unlimited material availability. Finally, and still within the same synchronized plan, you can calculate the monthly material and capacity requirements that you need to acquire over the long-term planning horizon to accomplish your strategic production goals.
- **Plan product families:** You can specify forecasts and sourcing rules at the product family level and specify resource requirements in the form of a bill of resources (BOR). You can view item information for your plan aggregated into categories.
- **Plan aggregate resources:** You can define and plan using an aggregate statement of availability for groups of resources.

ASCP Features

- **Order modifiers**
- **Utilization**
- **Time-phased constraints**



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ASCP Features (continued)

- **Specify order modifiers:** You can define supplier- and item-specific purchase order modifiers.
- **Utilization:** You can view time-phased utilization of your key resources and bottlenecks over the entire scheduling horizon. This enables you to see which key resources will be overutilized, and determine whether there is any possibility of improving the current schedule for a critical bottleneck resource.
- **View time-phased information for key constraints:** You can view how the plan satisfies your constraints along the scheduling horizon. Exceptions messages indicate when there are material or resource limitations. You can reschedule and reduce the number of orders that violate constraints.

ASCP Features

- **Component architecture**
- **Fully Internet enabled**
- **Multiple instances and multiple releases**
- **Rapid implementation**

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Planning Server Component Architecture

- Install as a component on an applications system
- Install on a distributed server and plan across instances
- Net change updates to and from planning server

Fully Internet Enabled

- Global access by using a browser

Multiple Instances and Releases

- Backwards compatible (10.7, 11.0, 11i)
- APIs to support legacy system integration

Rapid Implementation

- Start realizing savings immediately
- Build savings over time as planning processes are tuned
- One-Hour Install and Implementation Wizard
- Extensive defaulting
- Built-in collection programs

Plan Classes

Planning horizon	Operational	Tactical	Strategic
MPS, MRP, CRP	Infinite material and resources		
Planning horizon	Operational	Tactical	Strategic
Constraint-based plan	Material		
	Resource	Resource	
Planning horizon	Operational	Tactical	Strategic
Optimized plan	Material and resource constrained		

Plan Classes

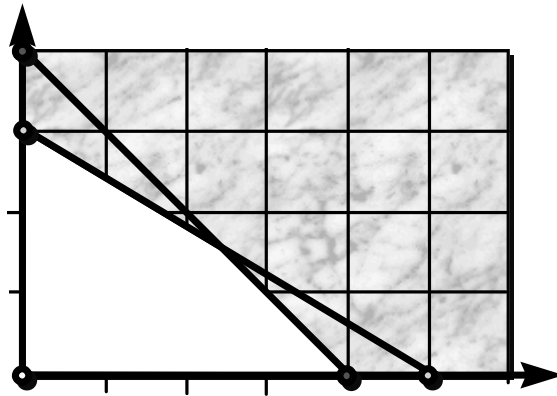
You can set plan options to generate plans having the following characteristics:

- Traditional MRP/CRP plan, assuming unconstrained material and resource availability. This plan can be useful as a basis of comparison with advanced plans.
- Constraint-based plan considering material constraints only
- Constraint-based plan considering resource constraints only
- Constraint-based plan considering material and resource constraints
- Optimized-plan with respect to hard or flexible material and/or resource constraints

With constraint-based planning, you can set the material and resource constraints differently for different planning horizons. The figure shows short-term operations scheduled within both material and resource constraints. The mid-range tactical plan is constrained by production resources, but assumes that material can be purchased as needed. Finally, the long-range strategic plan is set up for traditional capacity requirements planning. Infinite availability of materials and resources is assumed. This strategic plan will answer the question: What general level of materials and resources will be required to fulfill the long-term demand projection?

Optimized plans use both material and resource constraints over the entire planning horizon. However, you have a choice regarding whether those constraints are treated as hard constraints or soft constraints. Hard constraints require the solution to be bound by constraint limits. Soft constraints permit the optimizer to consider user-defined penalty factors associated with solutions that would fall outside of the constraint boundaries.

Constraint-Based Planning



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Constraint-Based Planning

Constraint-based planning (CBP) is a new approach for planning to meet customer demand within finite material availability and plant resource capacity. CBP takes into account constraints at the enterprise level as well as at the plant level. Material and capacity issues are considered simultaneously, and factory, distribution, and transportation issues are integrated.

Constraint-based planning (CBP) delivers a rich set of features for tactical as well as operational planning and scheduling.

Business Requirements

- A feasible plan that respects all constraints
- Real-time plan and schedule generation with net-change capabilities by leveraging memory-resident architectures.
- Plan at individual and aggregation levels of detail (bill of resources, product families)
- Real-time simulation and decision support
- Manual and interactive planning and scheduling

Optimization

- **ILOG solver and optimization technology**
- **Optimize plans to multiple strategic objectives**
- **Incorporated with third-generation memory-based planning**
- **Optimal sourcing decisions, production, and distribution plans for each organization**

Oracle APS and ILOG

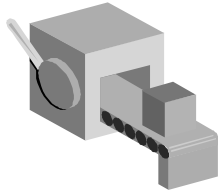
The Oracle Advanced Planning System employs advanced ILOG solver and optimization techniques. You can optimize your plans to financial and other enterprise strategic objectives. The memory based planner creates coordinated production and distribution plans for each organization. In addition, a constraint-based scheduling engine ensures that the plan is feasible and respects all of your constraints.

Business Requirements Met by Optimization

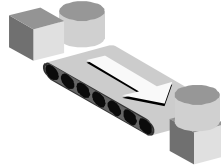
- Simultaneously plan material and capacity while considering the constraints of each
- Create plans that achieve multiple goals:
 - Minimize inventory costs.
 - Maximize on-time delivery.
 - Maximize overall plan profit.

Mixed-Mode Manufacturing Support

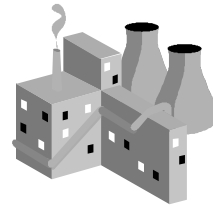
Oracle Advanced Planning Solution



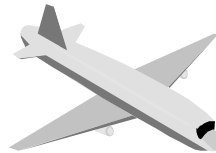
Discrete



Flow



Process



Project

8-14

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Mixed-Mode Manufacturing

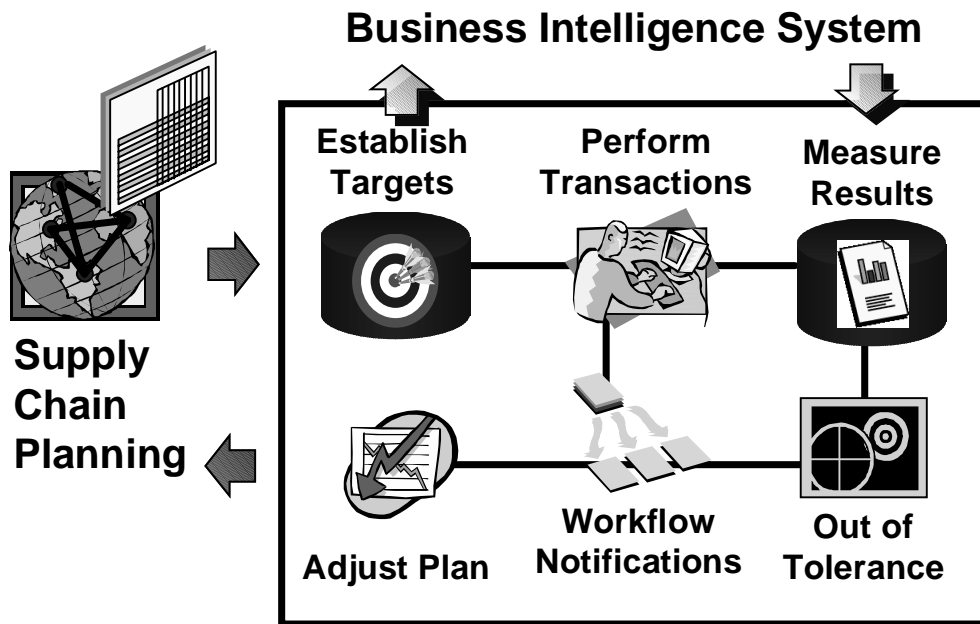
Support for mixed-mode manufacturing lets you have complete control over how you want to execute and manage production. This enables you to choose the best method for producing each of your products, and combine all of these methods within the same plant. It also enables you to implement the latest best practices, such as flow manufacturing or project manufacturing for engineer-to-order environments.

- Implement by product, line, and plant
- Adopt latest manufacturing practices
- Plan all methods simultaneously

Oracle delivers a full mixed-mode manufacturing solution that handles project, flow, configure-to-order, repetitive, and discrete manufacturing in one completely integrated solution.

- Single plan across all methods
- Support for engineer-to-order, aerospace, and defense:
 - Supply chain hard pegging
 - Unit effectivity (serial effectivity)
 - Borrow and payback
 - Project group netting
- Support for Seiban and flow manufacturing

Integrated Performance Management



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Integrated Performance Management

Oracle APS integrates with Oracle BIS and Oracle Workflow to create a closed-loop, continuous improvement cycle:

- Set organizational objectives to drive continuous improvement.
- Optimize your plan to performance targets.
- Execute to the plan.
- Measure the results against predefined key performance indicators.
- Easily and quickly evaluate a plan based on its impact on target KPIs.
- Manage by exception; automatically route notifications and alerts when corrective actions are required.
- Make adjustments to bring the plan back within tolerance.

Features

Integration with Oracle BIS performance management system:

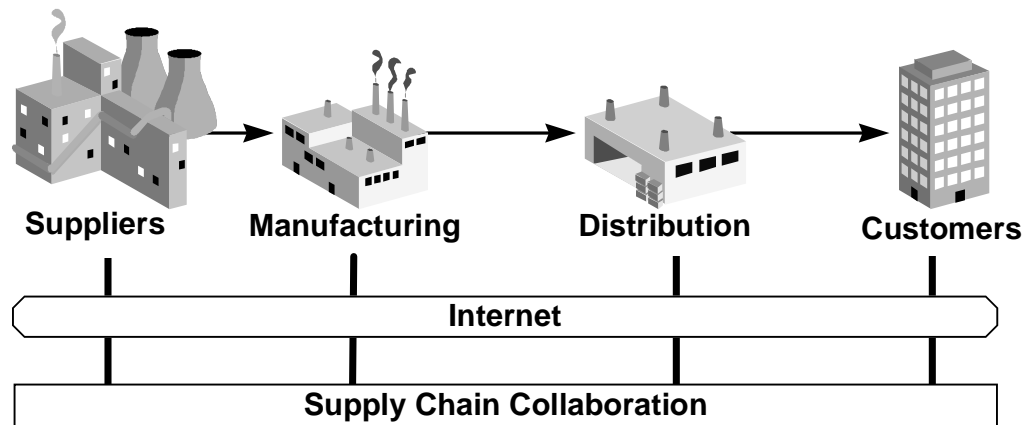
- Multiplan KPI comparisons
- Multiplan exception comparisons

Integration with Oracle Workflow:

- Notifications and corrective action alerts

Internet-Enabled Collaborative Planning

Virtual Enterprise



8-16

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Resource Planning for Virtual Enterprises

Oracle ASCP is fully accessible using an Internet browser for easy collaboration with your supply chain partners. Using the Internet, suppliers and customers can enter and view information and have their updates processed by ASCP.

Features

- Internet-based collaboration:
 - Customers review and enter forecasts.
 - Manufacturers share production schedules.
 - Suppliers share production capacity information.
 - ATP is based on supplier capacity.
 - Automatic exception notification is offered.

Benefits

- Gather, share, and process supply chain partner information using the Internet.
- Reduce labor requirements using self-service features:
 - Enable partners to view your latest planning data.
 - Push the responsibility of updating planning information out to your partners.

Summary

In this lesson, you should have learned how to:

- **Describe holistic planning and scheduling**
- **Explain how ASCP provides rapid return on investment**
- **Explain how ASCP supports mixed-mode manufacturing**
- **Explain how ASCP enables integrated performance management**

Summary

Holistic planning and scheduling packages a complete global solution that enables a company to plan, schedule, and optimize the entire supply chain within a single plan. ASCP provides many features designed to create plans that achieve selected goals while considering the material and resource constraints. When the user selects the optimization option, a three-phase optimization process optimizes sourcing decisions according to selected objectives, explodes production and distribution plans across the supply chain, and ensures that the plan is feasible and respects all constraints.

Practice 8-1 Overview

This practice is a quiz covering the ASCP Overview.

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Performing Practice 8-1

For detailed instructions on performing this practice, see Practice 8-1 in Appendix A, “Practices and Solutions.”