

# **R12.x Oracle Advanced Supply Chain Planning Fundamentals**

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## Preface

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### Profile

#### Before You Begin This Course

- Basic knowledge of planning
- Basic knowledge of Oracle applications navigation

#### Prerequisites

- Oracle Inventory
- Oracle Engineering Bills of Material.

#### How This Course Is Organized

*R12.x Oracle Advanced Supply Chain Planning Fundamentals* is an instructor-led course featuring lecture and hands-on exercises. Online demonstrations and written practice sessions reinforce the concepts and skills introduced.

## Related Publications

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### Oracle Publications

Title	Part Number
Oracle Advanced Planning Implementation and User's Guide, Release 12	B31553-01

### Additional Publications

- System release bulletins
- Installation and user's guides
- Read-me files
- International Oracle User's Group (IOUG) articles
- *Oracle Magazine*

# Typographic Conventions

---

## Typographic Conventions in Text

Convention	Element	Example
Bold italic	Glossary term (if there is a glossary)	The <b>algorithm</b> inserts the new key.
Caps and lowercase	Buttons, check boxes, triggers, windows	Click the Executable button. Select the Can't Delete Card check box. Assign a When-Validate-Item trigger to the ORD block. Open the Master Schedule window.
Courier new, case sensitive (default is lowercase)	Code output, directory names, filenames, passwords, pathnames, URLs, user input, usernames	Code output: debug.set ('I', 300); Directory: bin (DOS), \$FMHOME (UNIX) Filename: Locate the init.ora file. Password: User tiger as your password. Pathname: Open c:\my_docs\projects URL: Go to <a href="http://www.oracle.com">http://www.oracle.com</a> User input: Enter 300 Username: Log on as scott
Initial cap	Graphics labels (unless the term is a proper noun)	Customer address ( <i>but</i> Oracle Payables)
Italic	Emphasized words and phrases, titles of books and courses, variables	Do <i>not</i> save changes to the database. For further information, see <i>Oracle7 Server SQL Language Reference Manual</i> . Enter user_id@us.oracle.com, where <i>user_id</i> is the name of the user.
Quotation marks	Interface elements with long names that have only initial caps; lesson and chapter titles in cross-references	Select "Include a reusable module component" and click Finish.  This subject is covered in Unit II, Lesson 3, "Working with Objects."
Uppercase	SQL column names, commands, functions, schemas, table names	Use the SELECT command to view information stored in the LAST_NAME column of the EMP table.
Arrow	Menu paths	Select File > Save.
Brackets	Key names	Press [Enter].
Commas	Key sequences	Press and release keys one at a time: [Alternate], [F], [D]
Plus signs	Key combinations	Press and hold these keys simultaneously: [Ctrl]+[Alt]+[Del]

## Typographic Conventions in Code

Convention	Element	Example
------------	---------	---------

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Caps and lowercase	Oracle Forms triggers	When-Validate-Item
Lowercase	Column names, table names	SELECT last_name FROM s_emp;
	Passwords	DROP USER scott IDENTIFIED BY tiger;
	PL/SQL objects	OG_ACTIVATE_LAYER (OG_GET_LAYER ('prod_pie_layer'))
Lowercase italic	Syntax variables	CREATE ROLE <i>role</i>
Uppercase	SQL commands and functions	SELECT userid FROM emp;

## Typographic Conventions in Oracle Application Navigation Paths

This course uses simplified navigation paths, such as the following example, to direct you through Oracle Applications.

(N) Invoice > Entry > Invoice Batches Summary (M) Query > Find (B) Approve

This simplified path translates to the following:

1. (N) From the Navigator window, select **Invoice** then **Entry** then **Invoice Batches Summary**.
2. (M) From the menu, select **Query** then **Find**.
3. (B) Click the **Approve** button.

### Notations:

(N) = Navigator

(M) = Menu

(T) = Tab

(B) = Button

(I) = Icon

(H) = Hyperlink

(ST) = Sub Tab

## Typographical Conventions in Oracle Application Help System Paths

This course uses a “navigation path” convention to represent actions you perform to find pertinent information in the Oracle Applications Help System.

The following help navigation path, for example—

(Help) General Ledger > Journals > Enter Journals

—represents the following sequence of actions:

1. In the navigation frame of the help system window, expand the General Ledger entry.
2. Under the General Ledger entry, expand Journals.

3. Under Journals, select Enter Journals.
4. Review the Enter Journals topic that appears in the document frame of the help system window.

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# **Overview to Advanced Supply Chain Planning**

**Chapter 1**

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# **Overview to Advanced Supply Chain Planning**

1

## **Advanced Supply Chain Planning Fundamentals**

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## Objectives

### Objectives

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

- Identify planning business issues
- Describe outcomes of using Oracle Advanced Supply Chain Planning
- Describe plan types
- Describe implementation progression
- Describe planning business flow
- Describe planning data flow

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## Module Overview: Topics

### Module Overview: Topics

- **Planning business issues**
- **Oracle Advanced Supply Chain Planning**
- **Plan types**
- **Implementation progression**
- **Planning business flow**
- **Planning data flow**

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## Topic Overview: Planning Business Issues I

### Topic Overview: Planning Business Issues I

- **Today: A Changing Global Landscape**
- **Traditional planning engine multi-step, high latency, limited collaboration**
- **Business impacts implications of the traditional planning model**
- **Oracle Advanced Planning zero latency, real-time collaboration**

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### Topic Overview: Planning Business Issues II

- Oracle Advanced Planning complete e-business planning solution
- APS business flow: Plan
- APS business flow: Execute
- APS business flow: Compare performance to targets
- APS business flow: Corrective action
- Oracle Advanced Planning key capabilities
- Oracle Advanced Planning component architecture

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## Business Trends Toward Demand-Driven Adaptive Planning

### Business Trends Toward Demand-Driven Adaptive Planning

EVOLVING CHALLENGES	IMPACTS TO SUPPLY CHAIN
<b>Older business models are challenged by decentralized global network model</b>	<b>Move from static demand planning to demand sensing and shaping</b> <ul style="list-style-type: none"><li>• Capture demand signals more frequently and closer to the point of sale – drive to consensus demand number</li><li>• Shape your demand with profitability and capacity as key drivers</li><li>• Implement continuous and collaborative sales and operations planning process</li></ul>
<b>New challenges and focus areas:</b> <ul style="list-style-type: none"><li>• Globalization and global sourcing, leaner supply networks, increased demand variability and cost volatility</li><li>• Increased customer expectations, faster product life cycles with local market requirements</li><li>• Mergers and acquisitions, and continued consolidation of suppliers and customers</li><li>• Increasing compliance requirements such as Sarbanes-Oxley</li></ul>	<b>Multi-tier decision support replaces enterprise plans</b> <ul style="list-style-type: none"><li>• Materials and logistics are both primary constraints</li><li>• Cross-enterprise synchronized view of demand signal encompassing both supply and demand visibility</li></ul> <b>Focus on more frequent supply network flow analysis</b> <ul style="list-style-type: none"><li>• Analyze optimal flows for market response, changing geo-political situations, and unplanned events</li><li>• Rationalize suppliers to minimize risk</li><li>• Determine postponement strategies</li></ul>

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### Changing Global Landscape

Today's changing global landscape introduced business trends and evolving challenges that impact your supply chains and how you manage them. The 'old' model, where many decisions are made in local decentralized fashion, cannot effectively address the problems that arise related to selling, producing, buying, and distributing globally. Considerations include increased variability, mitigation of risk, impacts of continuous mergers and acquisitions in your customer and supplier base, local product requirements, and more volatile product life cycles.

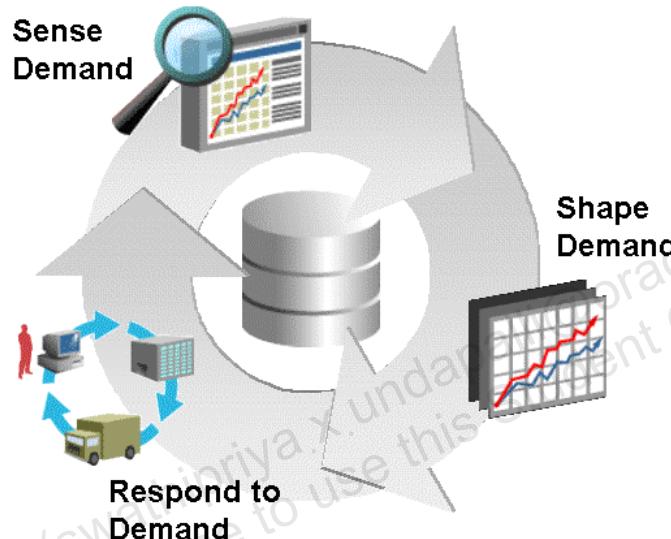
To address these problems, consider:

- Moving from a static demand planning process to demand sensing and shaping, where you capture demand signals close to your point of sale, collaborate on a consensus demand number in real time, and shape your demand with profitability and capacity as key drivers
- Multi-tier decision support instead of enterprise plans, where you consider both material and logistics as primary constraints and ensure a cross-enterprise, synchronized view of demand and supply, and conduct more scrutiny of material liability
- Focusing on more frequent supply network flow analysis, where you analyze and simulate how to react to market responses, changing geo political situations, unplanned events, hedging strategies and product and customer segmentation.

## Demand-Driven Adaptive Planning

### Demand-Driven Adaptive Planning

The demand driven company runs on real-time information.



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### Demand Driven Adaptive Planning

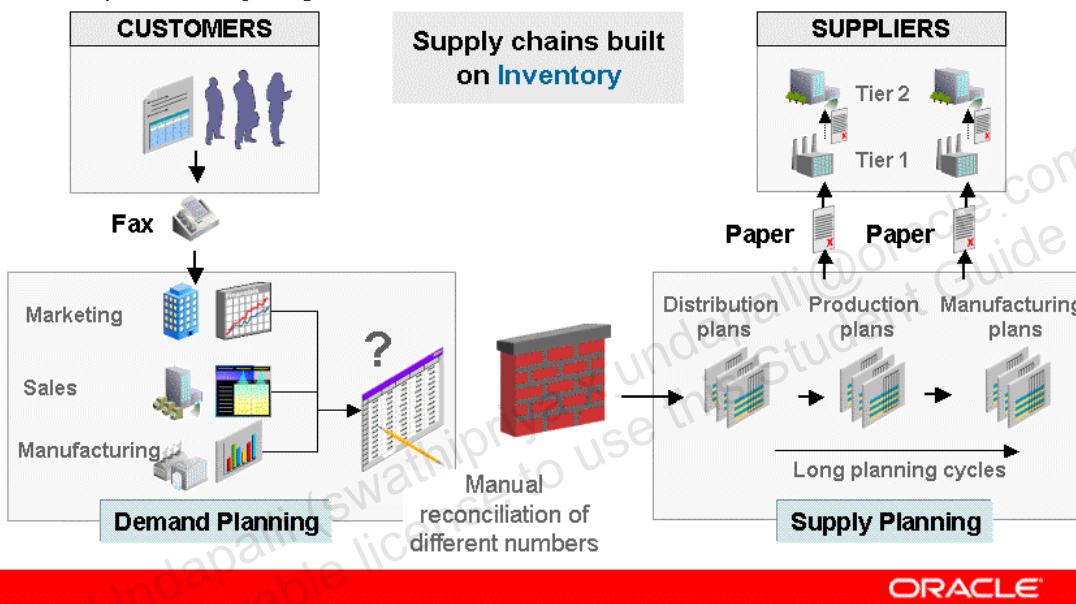
Demand driven adaptive planning is about running your company on more real time demand information. You want to sense the demand more quickly and closer to end customer consumption by getting the demand signals into a one number from the various constituents like marketing, sales, and manufacturing, as well as your customers. By comparing planned demand to actual, you can:

- Consider promotions and sales incentives to shape your demand
- Implement the recommendations from your sales and operations planning process into your downstream holistic supply and distribution planning, and order promising.

## Disconnected Systems Cannot Enable Demand-Driven Adaptive Planning

### Disconnected Systems Cannot Enable Demand-Driven Adaptive Planning

- Maintain excess inventory
- Reserve production capacity
- Expedite everything!



### Disconnected Systems

However, you can not become demand driven and adaptive if you have disconnected planning systems in which:

- Your planning process is a multi-step process, where typically demand and forecast data are communicated in different ways
- Supply planning is cumbersome, where typically it starts with the wrong demand number, and then takes weeks to execute plan after plan
- There is limited visibility to changes from your customers (demand) or suppliers (supply capacity), or it takes a long time to get their responses

The usual response to this situation is:

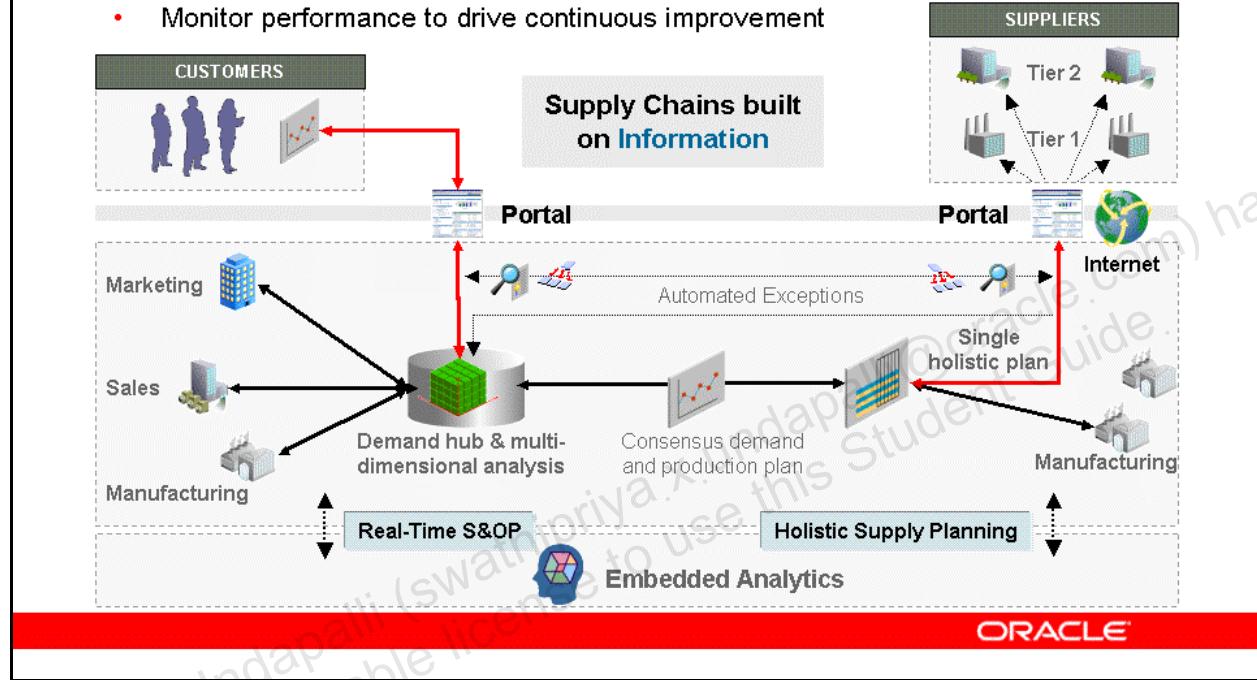
- Keep lots of inventory – just in case
- Hold back on production capacity – just in case
- Expedite everything

In essence, supply chains are built on *inventory*.

## Demand-Driven Adaptive Planning Platform

### Demand-Driven Adaptive Planning Platform

- Real-time end demand visibility – Quickly sense and respond to demand changes
- Shape demand and align business plans quickly
- Manage your business with real-time sales and operations planning
- Monitor performance to drive continuous improvement



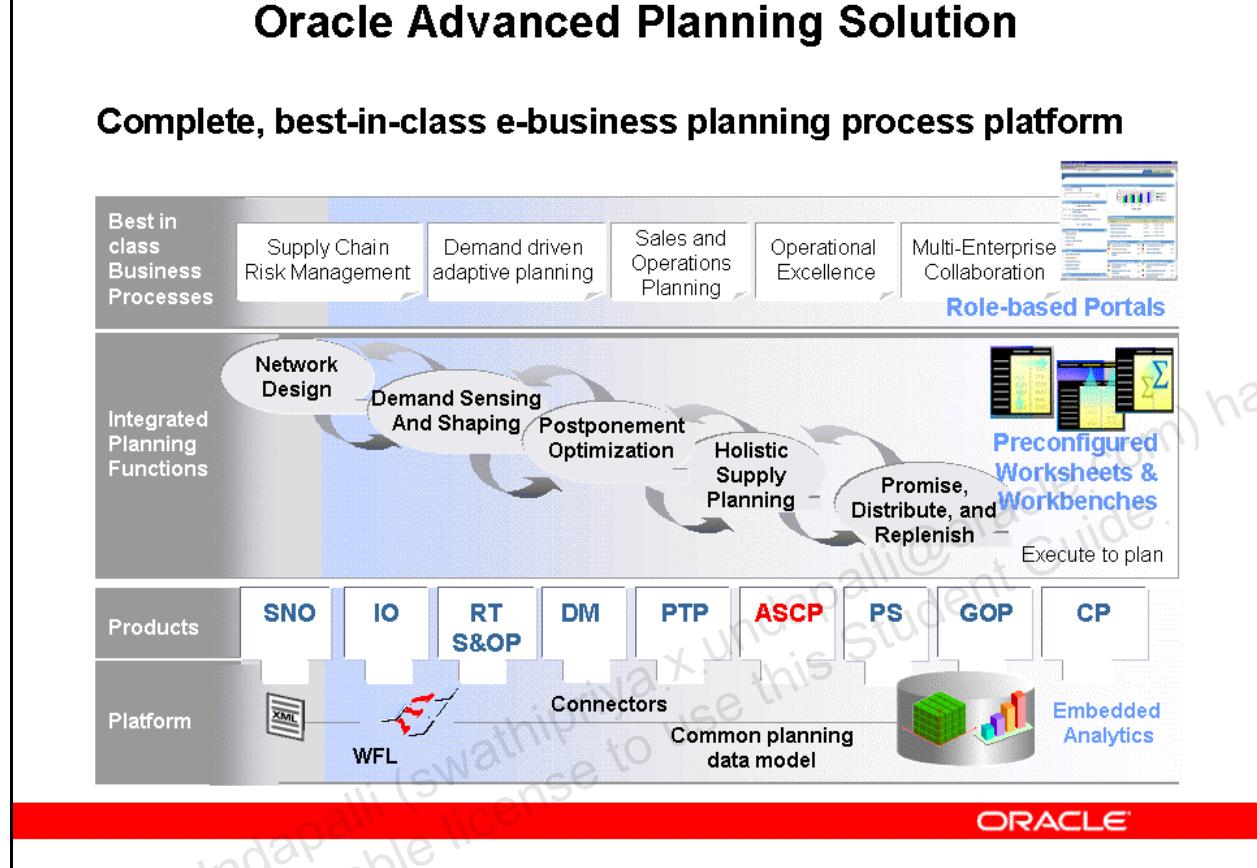
### A Better Approach

A better approach is to implement an adaptive planning process platform that enables you to:

- Start where it hurts most
- Evolve incrementally to a complete demand driven solution with:
  - Real time visibility to your demand and demand changes
  - Shaping demand and aligning business plans quickly through balancing of supply and demand
  - Operations in a truly real time decision making sales and operations planning process, and
  - Continuously monitor and measure to drive improvements.

In essence, a supply chain that is fully connected and built on *information* instead of inventory

## Oracle Advanced Planning Solution



### Oracle Advanced Planning Solution

Within the context of the overall collaborative E-Business Suite, Oracle provides a complete e-business planning platform.

It is based on a common planning data model and platform that connects all products to deliver integrated planning functions.

This enables best business processes such as:

- Supply chain risk management
- Demand driven adaptive planning
- Supply chain excellence
- Sales and operations planning, and
- Multi-enterprise collaboration.

## Oracle Advanced Planning

# Oracle Advanced Planning

### Enables transformational business processes:

- **Demand-driven adaptive planning**
- **Global supply chain design and risk management**
- **Drive operational excellence**
- **Improve demand fulfillment**
- **Drive continuous improvement**

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## Oracle Advanced Planning

Oracle Advanced Planning enables leading edge and transformational processes:

- Demand driven adaptive planning
  - Sense demand through advanced analytics, improved consensus forecasting, and real-time visibility to demand events.
  - Shape demand by enabling real-time sales and operations planning, and promotions planning and optimization.
  - Respond faster to demand through holistic supply planning, cross-enterprise collaboration, and demand-driven VMI.
- Global supply chain design and risk management – design your network holistically and more frequently while accounting for variability and incorporating fault tolerance in your supply chain.
- Drive supply chain operational excellence
  - improve demand fulfillment through real-time distributed global order promising,
  - improve shop floor efficiency with real-time production scheduling.
  - Drive continuous improvement with embedded analytics

## Oracle Advanced Planning Complete E-Business Planning Solution

- Oracle Advanced Supply Chain Planning (ASCP)
  - Oracle Constraint Based Optimization (CBO)
- Oracle Collaborative Planning (CP)
- Oracle Demantra Demand Management (DM)
  - Oracle Demantra Advanced Forecasting and Demand Modeling (AFDM)
  - Oracle Demantra Real-Time Sales and Operations Planning (RTS&OP)
- Oracle Global Order Promising (GOP)
- Oracle Inventory Optimization (IO)
- Oracle Production Scheduling (PS)
- Oracle Strategic Network Optimization (SNO)

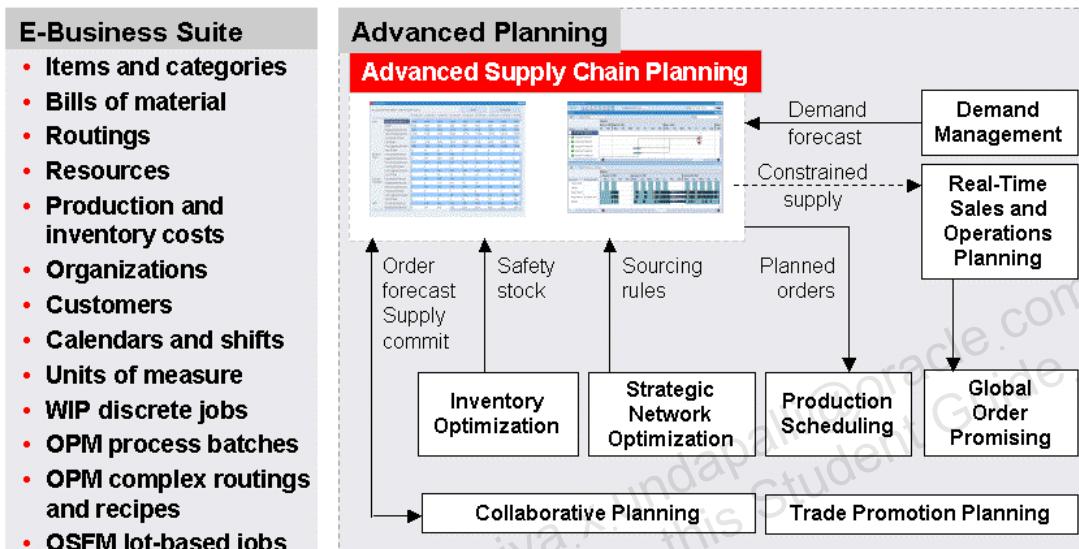
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### Oracle Advanced Planning – Complete E-Business Planning Solution

This slide lists the Oracle Advanced Planning suite licensable products.

## Integrated Oracle Advanced Supply Chain Planning

### Integrated Oracle Advanced Supply Chain Planning



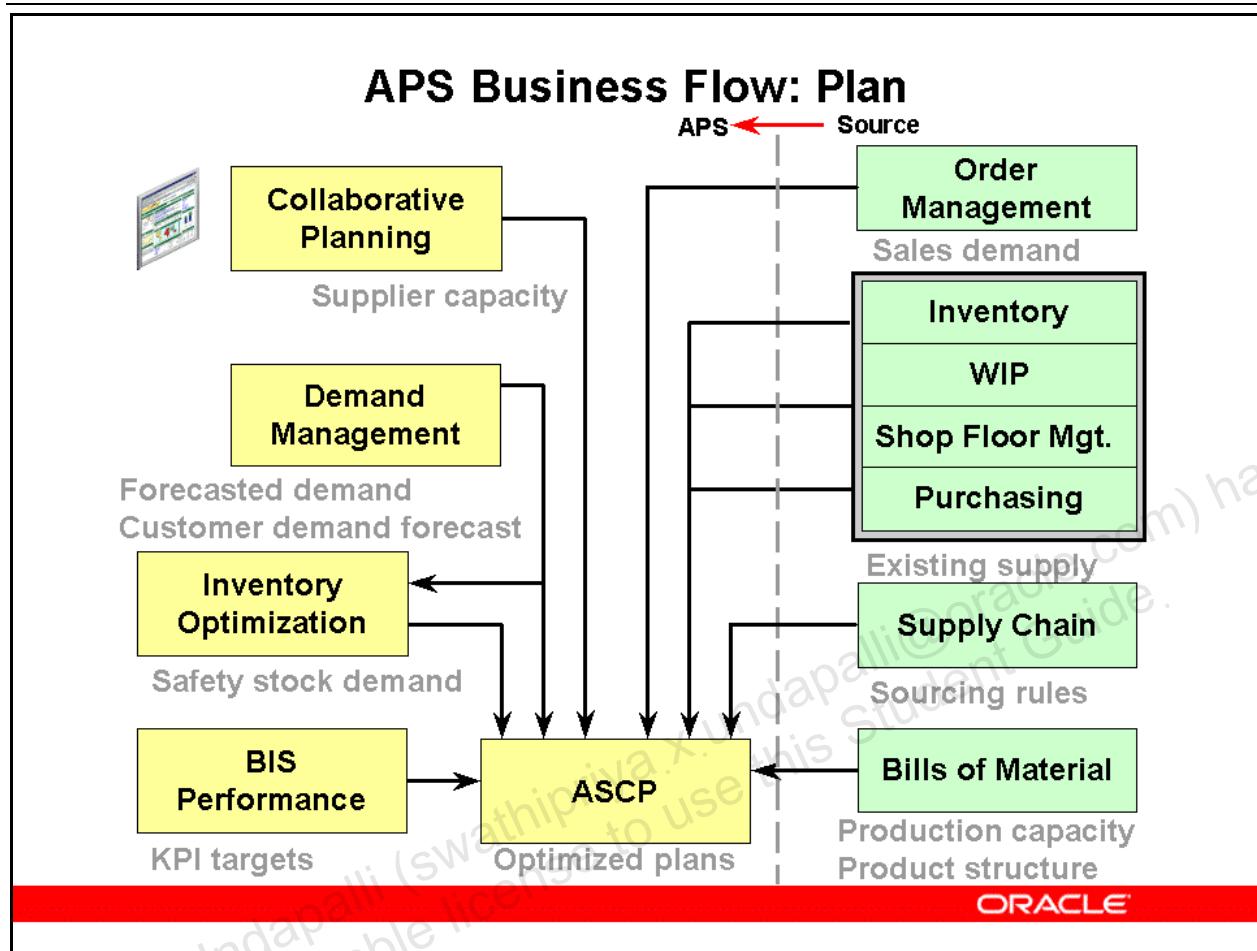
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### Integrated Solution

Another important advantage of the integrated solution is that you can deploy it gradually without the need to build integrations and without fear of getting stuck in a previously chosen model. You can start with Advanced Supply Chain Planning at any point and not lose out at the end as all planning components work together.

You will gain biggest benefits when deploying all modules, but when that is not feasible right away, from a scope or investment aspect, it will still all work in an integrated fashion at the end. Once you have implemented one of the Oracle Advanced Planning Modules, each additional implementation leverages what has been done before, so that the future implementations can be faster and at a lower cost, allowing you to add value rapidly.

## APS Business Flow: Plan



### Planning Information Flow

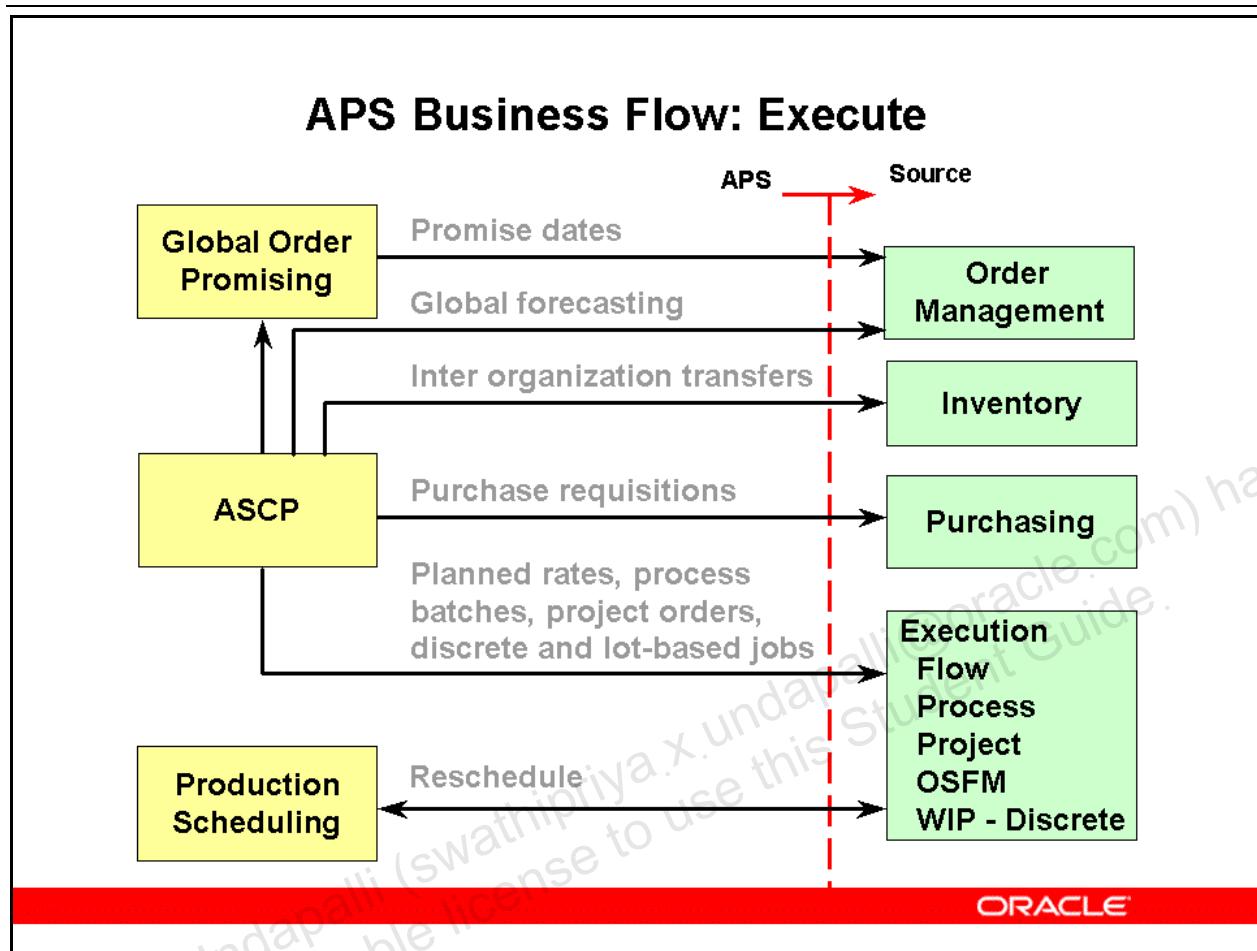
Collaborative Planning serves as a collaboration platform for suppliers and planners. It can be used to flag mismatches between supply and demand, change supplier schedules, publish planned orders to suppliers, and receive supplier capacity information into Oracle Advanced Supply Chain Planning.

Oracle Demantra Demand Management collects information about future demand from supply chain partners and internal sources. The consensus demand forecast is input to the demand schedule for the Oracle Advanced Supply Chain Planning engine.

Oracle Inventory Optimization takes in the demand forecast as well. The safety stock demand output from Oracle Inventory Optimization is input to Oracle Advanced Supply Chain Planning, along with the demand forecast and other sources of demand, such as sales orders and interplant transfers.

Collection programs obtain source instance data for planning, such as sales orders, on-hand inventory, open purchase orders, supply chain sourcing rules, product structure (bill of material) and production resource capacity. Advanced Supply Chain Planning generates replenishment plans optimized to business objectives that are consistent with the key performance indicator targets you have established.

## APS Business Flow: Execute



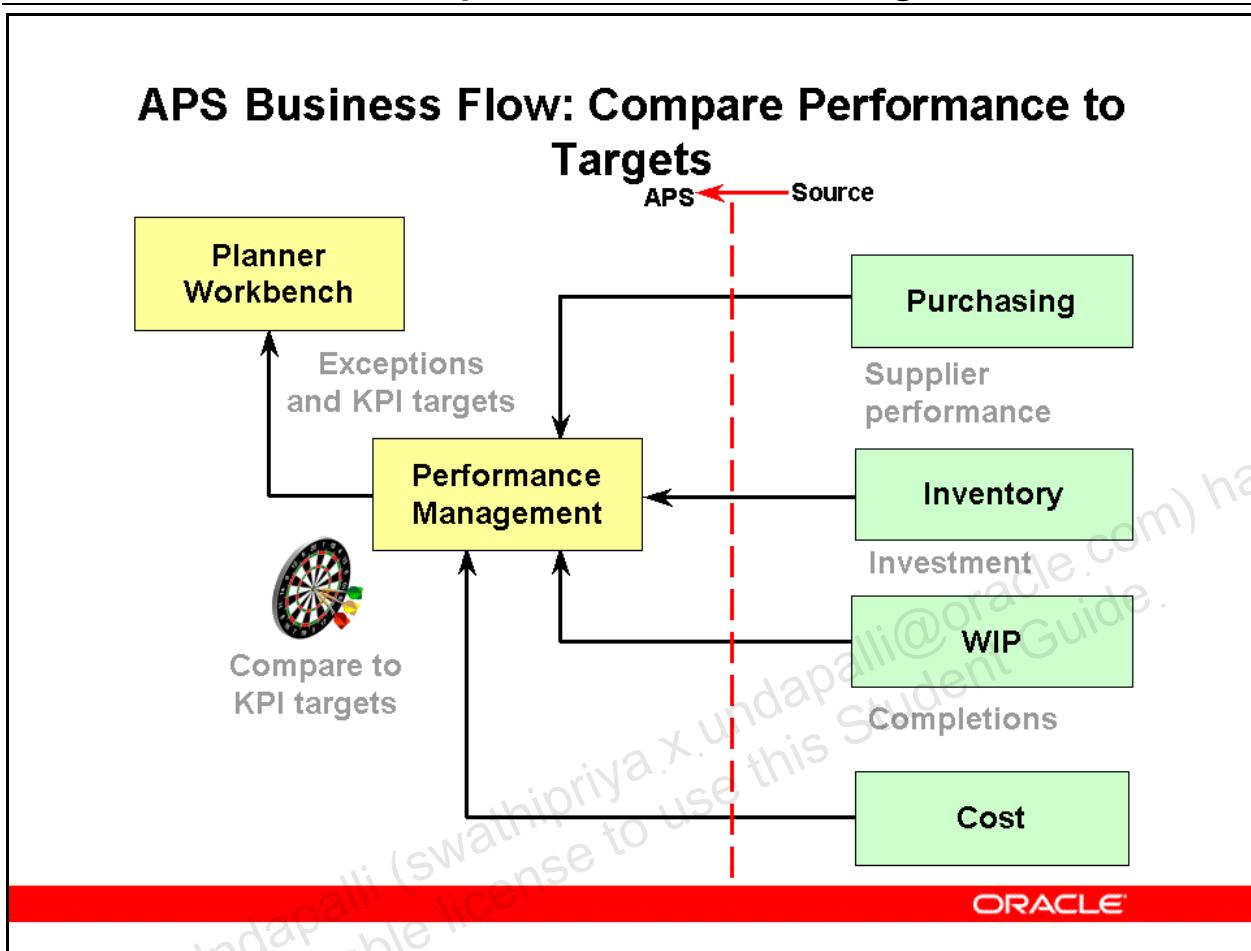
### Executing Plans

Oracle Advanced Supply Chain Planning creates an optimized replenishment supply plan consisting of planned orders and purchase requisitions. The advanced supply chain plan output forms the basis for Oracle Global Order Promising calculations.

Oracle Advanced Supply Chain Planning also suggests sourcing and date changes to sales orders based on global forecast calculations.

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

## APS Business Flow: Compare Performance to Targets



### Measuring Performance, Comparison to Targets, and Feedback

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.

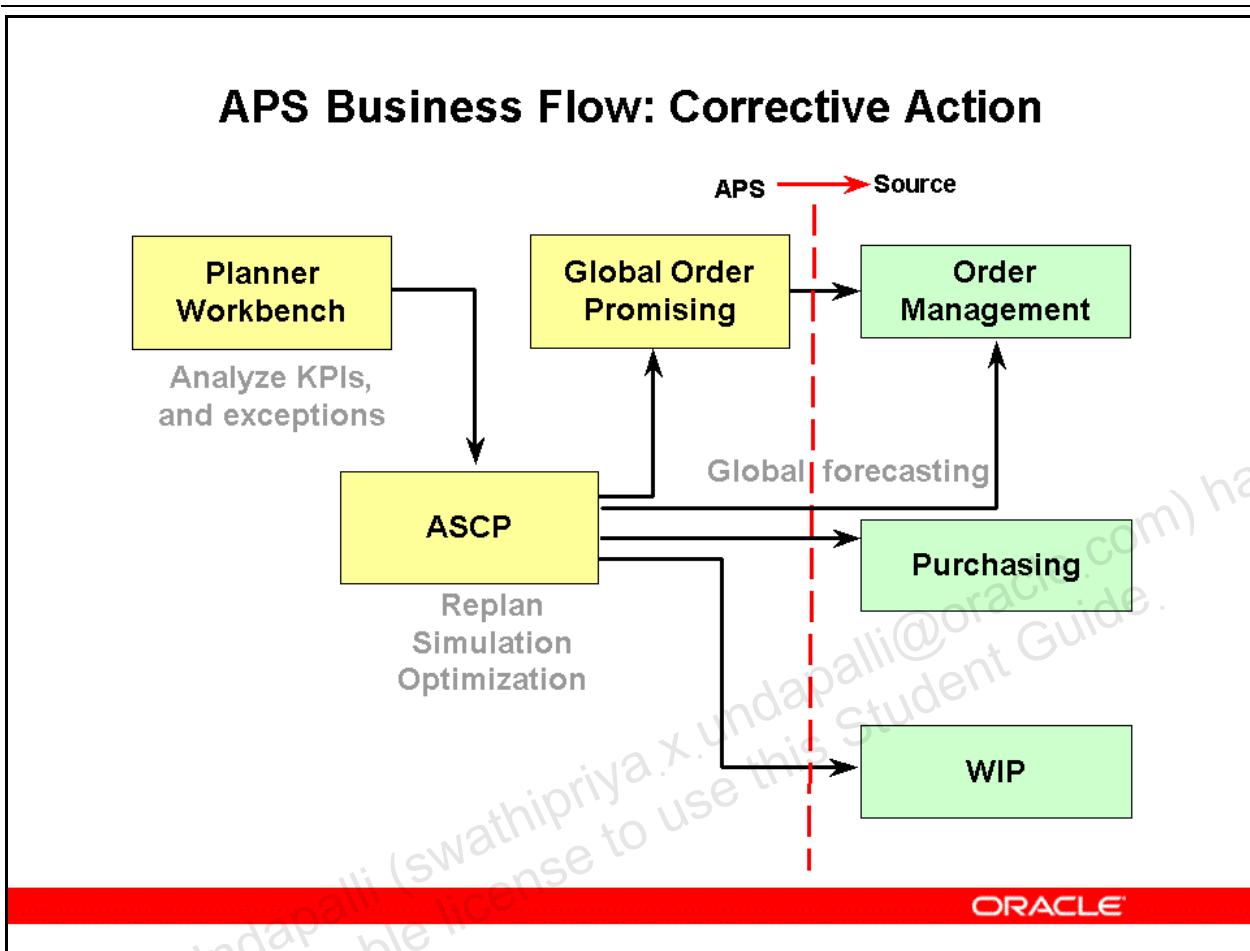
Supplier performance and work in process completions are measures of on-time delivery and resource utilization. Inventory investment is reflected in inventory turnover ratio. Cost is an important component of profit margin.

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

## APS Business Flow: Corrective Action



### Taking Corrective Action

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

The planning control loop is closed by:

- AutoCreate orders: this concurrent program implements a user-controlled range of planned orders
- Individually processing exception messages, such as expediting an order or changing an order quantity
- Re-planning: This process recalculates order suggestions and Global ATP promise information based on adjusted data.

## Oracle Advanced Planning Key Capabilities

### Oracle Advanced Planning Key Capabilities

- **Demantra Demand Management**
- **Supply Chain, Distribution, and Manufacturing Planning**
- **Global Order Promising**
- **Production Scheduling**

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### Oracle Advanced Planning – Key Capabilities

Oracle Advanced Planning provides many key capabilities, of which the most important ones are:

- **Demantra Demand Management**
  - Achieve consensus forecast through a collaborative demand planning process and more accurate forecast by leveraging a better statistical forecasting engine
- **Supply Chain Distribution and Manufacturing Planning**
  - Determine an optimal supply plan using a single holistic plan for all facilities. You can run unconstrained, constrained, and optimized plans.
  - Determine inventory rebalancing and allocation strategy across your distribution network
- **Global Order Promising**
  - Promise accurate (sales order) dates while taking into account available material, manufacturing capacity, supplier capacity, and transportation capacity
  - Allocate (short) supply to (key) demand
- **Production Scheduling**

- Determine optimal resource schedules for your plant

## Oracle Advanced Planning Key Capabilities

### Oracle Advanced Planning Key Capabilities

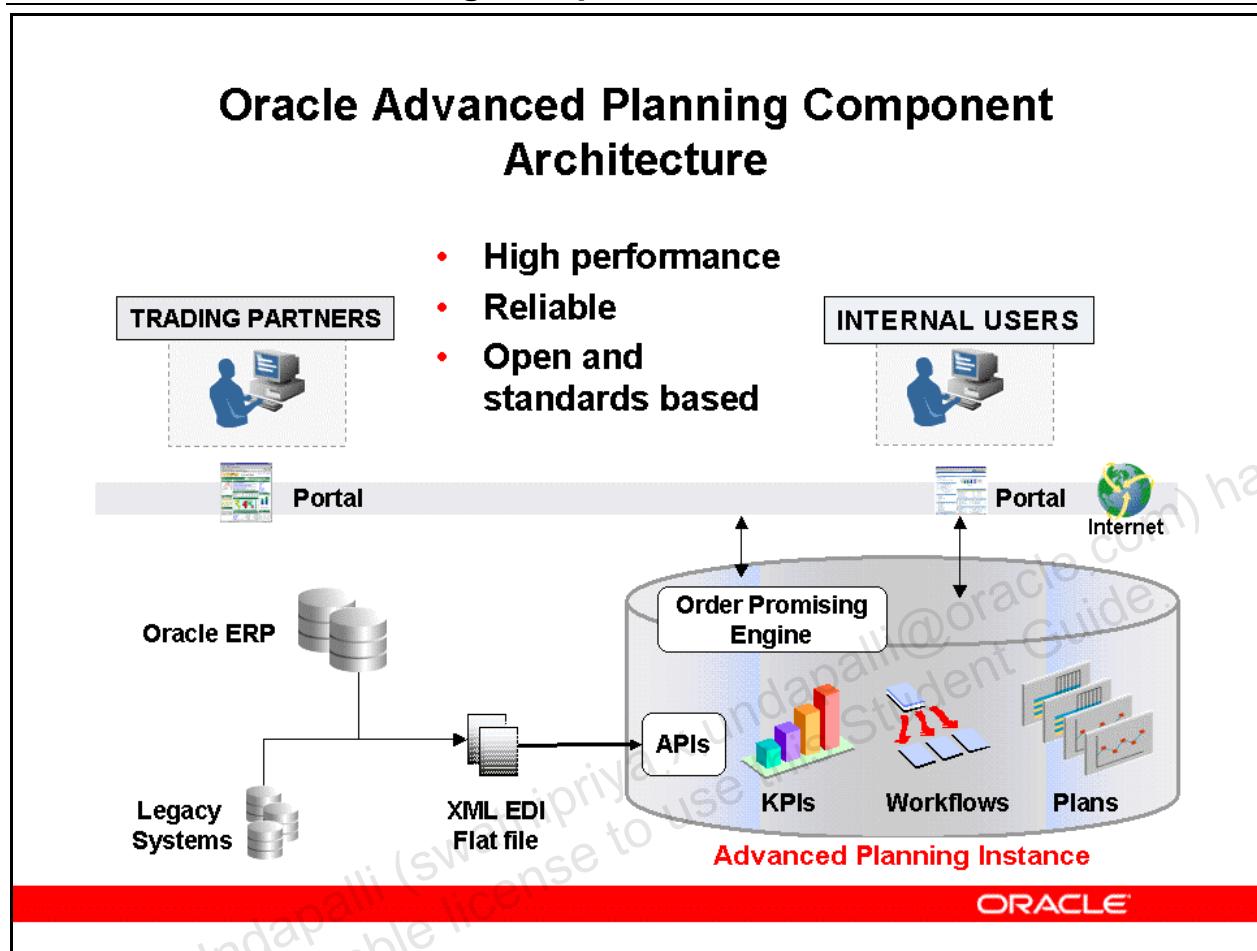
- **Inventory Optimization**
- **Collaborative Planning**
- **Strategic Network Optimization**

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### Oracle Advanced Planning – Key Capabilities (continued)

- **Inventory Optimization**
  - Determine where to hold which inventory in your supply chain, at what level in the bill of material (postponement optimization)
- **Collaborative Planning**
  - Collaborative demand and supply planning: receive order forecasts from your customers, send supply commits to your customers; send order forecasts to your suppliers, receive supply commits from your suppliers
  - Vendor managed inventory (VMI)
  - Supply chain exception management: user-definable exceptions to monitor supply-demand discrepancies while planning with involvement of your trading partners
- **Strategic Network Optimization**
  - Design fault tolerant supply and distribution networks
  - Rationalize your supply chain assets
  - Evaluate supply chain risk scenarios and (un)planned events

## Oracle Advanced Planning Component Architecture



### Oracle Advanced Planning Component Architecture

Oracle database-centric architecture allows for:

- **High performance deployments**
  - In-memory only when needed
  - Multi-threaded snapshot
  - Leverages key database features like materialized views, partitions, and analytical workspaces
- **Reliability**
  - All plan information resides in the database
  - Hot backup and recovery
  - Leverages grid computing infrastructure
  - All planning information and even the order promising engine reside in the database; you can leverage core database technology like hot backup and recovery.
- **Open and standards based to facilitate integration with your ERP system.**
  - Runs against all versions of Oracle EBS (11i, 12.0)

- Deploy against legacy systems

## Advanced Supply Chain Planning

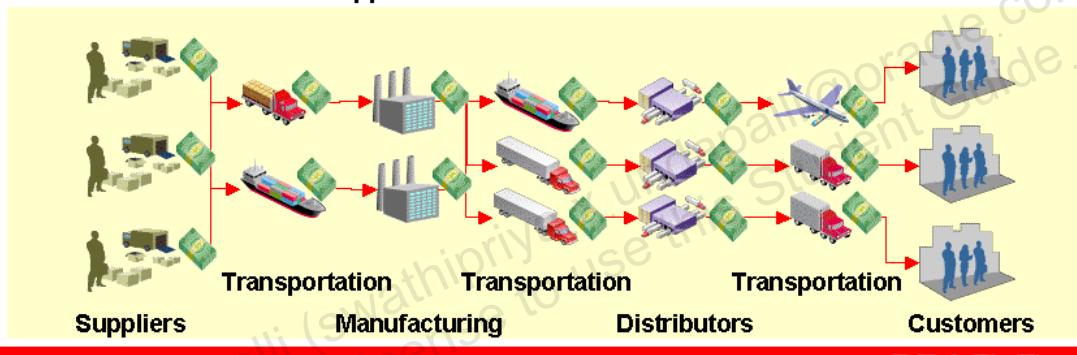
# Advanced Supply Chain Planning

### Supply Chain and Distribution Planning

- Product family and item level planning
- Alternate components, resources, processes, suppliers, facilities, and ship methods
- End-item substitution
- Critical items and resources; aggregate resources
- Bills of distribution and transfer rules
- Circular sourcing, load consolidation, allocation rules
- Include customer and supplier facilities

### Manufacturing Planning

- Sequence dependent setups/changeovers
- Simultaneous resources
- Batch resources
- Alternate resources
- Minimum transfer quantities
- Complex, network routings
- By-products and co-products
- Line rates and take times



### A Comprehensive Solution for Supply Chain, Distribution, and Manufacturing Planning

Oracle Advanced Supply Chain Planning offers a comprehensive solution for supply chain, distribution, and manufacturing planning that takes into consideration all your supply chain nodes (including your manufacturing and distribution centers, suppliers, and customers)

The Oracle solution is a single solution that is based on *one* supply chain model and *one* setup and that it supports all key requirements.



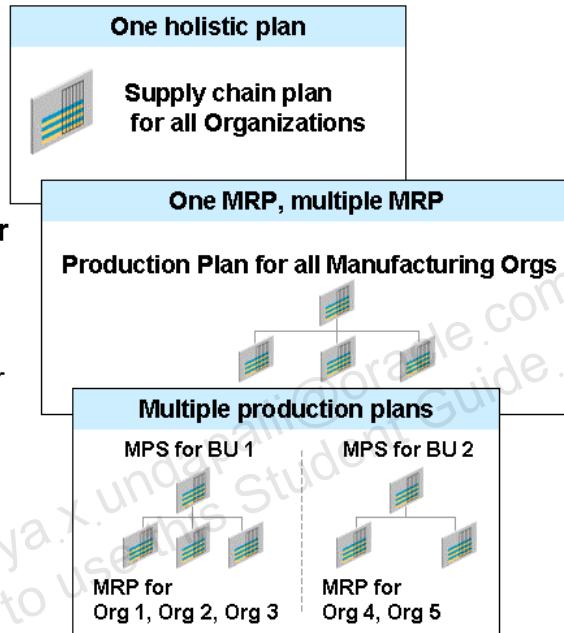
### Oracle Advanced Supply Chain Planning

Oracle Advanced Supply Chain Planning enables you to start at any point of sophistication. Whether your organization today uses spreadsheets or is looking to replace an outdated advanced planning solution, you can start anywhere and add value. Key is that you can start “small and simple” and evolve to “broad and sophisticated” at any point in time. The flexibility of Oracle Advanced Supply Chain Planning lets you continually add incremental process improvements instead of a long drawn out implementation.

## Adaptable: Segment the Problem As Needed

### Adaptable: Segment the Problem As Needed

- **Adapts to your current business model**
  - Single plan or multiple plans
  - Hub-and-spoke planning models
- **Evolve planning model at your own pace**
  - Re-configure easily by modifying plan options instead of re-implementing or re-modeling
- **Multiple models can co-exist**



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### Adaptable Solution

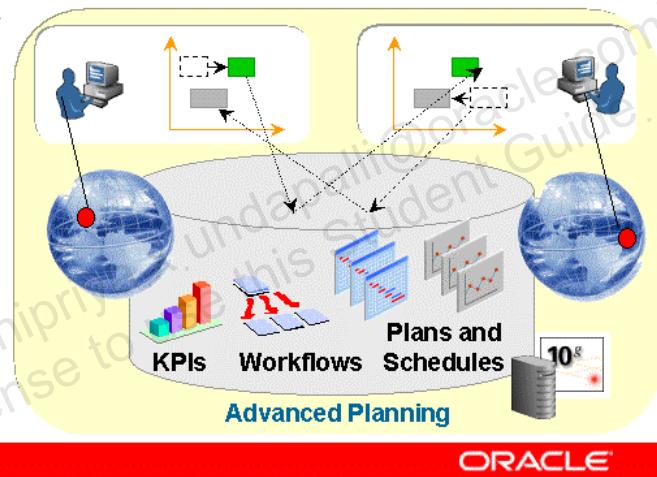
The Oracle solution is highly adaptable. You can segment the problem as needed, whether you want to run a single holistic plan or multiple plans.

You can evolve your planning system as your company and its supply chain planning model evolves and multiple models can co-exist. Changing the model does not require reimplementation of the system.

## Advanced Supply Chain Planning Planners Collaborate On A Single Plan

### Advanced Supply Chain Planning Planners Collaborate On A Single Plan

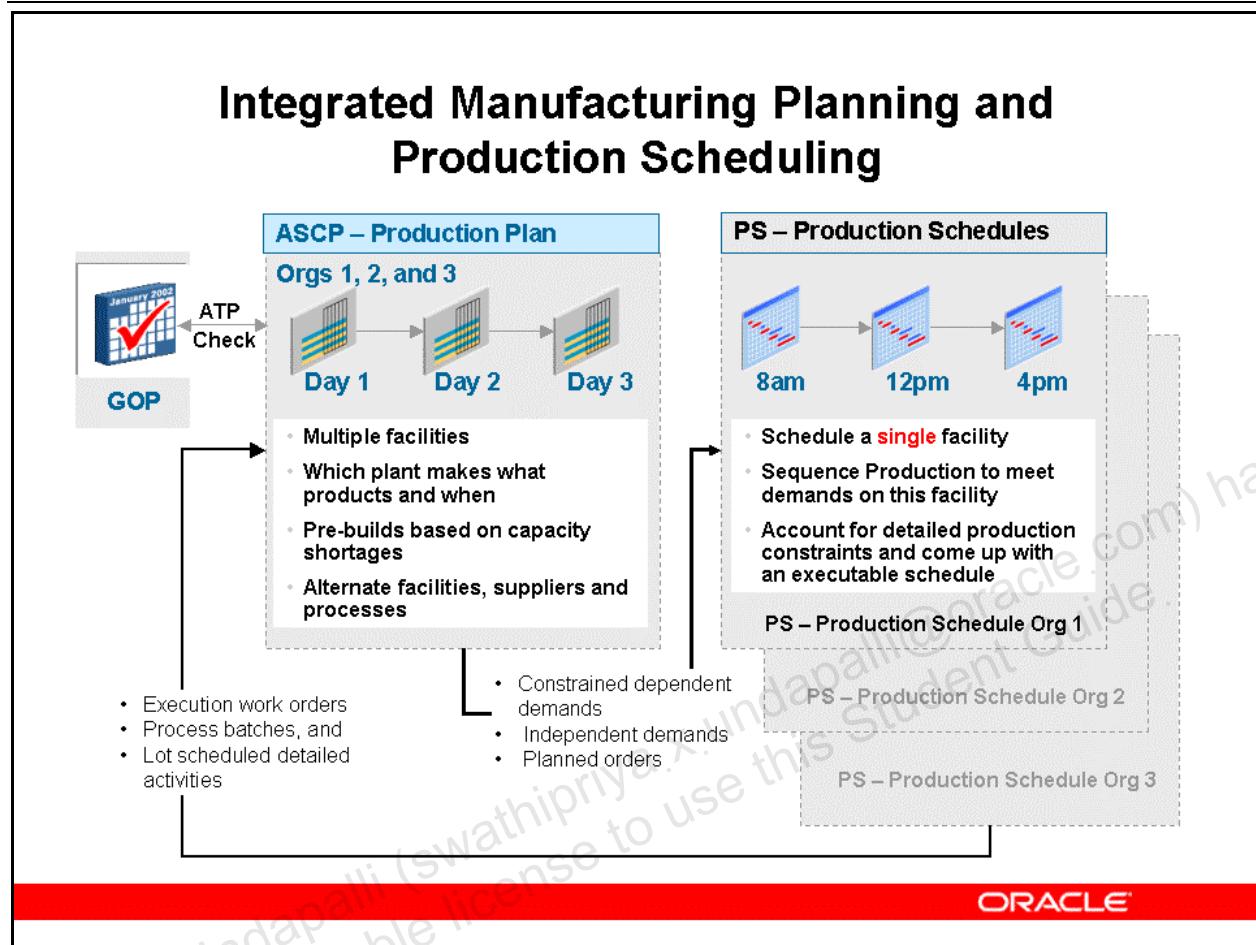
- Unlimited number of planners
- Collaborate from anywhere
- Preserve each planner's work
- Immediate visibility to changes
- Full undo capability



### Planner Collaboration

And all planning and simulation is happening in a framework that enables all of your planners to work and collaborate simultaneously.

# Integrated Manufacturing Planning and Production Scheduling



## Integrated Manufacturing Planning and Scheduling Process

Oracle provides a comprehensive and integrated manufacturing planning and scheduling process through tight integration between Oracle e-Business Suite, Oracle Advanced Supply Chain Planning, and Oracle Production Scheduling. The initial plan, including decisions on what facilities produce what products are fed from Advanced Supply Chain Planning to Production Scheduling. Oracle Production Scheduling then refines the plan into a detailed schedule and sequence; it becomes the starting point for the next supply chain plan.

## **Topic Overview: Oracle Advanced Supply Chain Planning**

- **Oracle Advanced Supply Chain Planning**
- **Oracle Advanced Supply Chain Planning features**

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## Oracle Advanced Supply Chain Planning

### Oracle Advanced Supply Chain Planning



Balanced supply  
and demand...

...across the  
supply chain



Respects  
constraints...

...while meeting  
organizational objectives

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### Oracle Advanced Supply Chain Planning

Use planning to balance supply and demand.

Use supply chain planning to balance supply and demand across your supply chain.

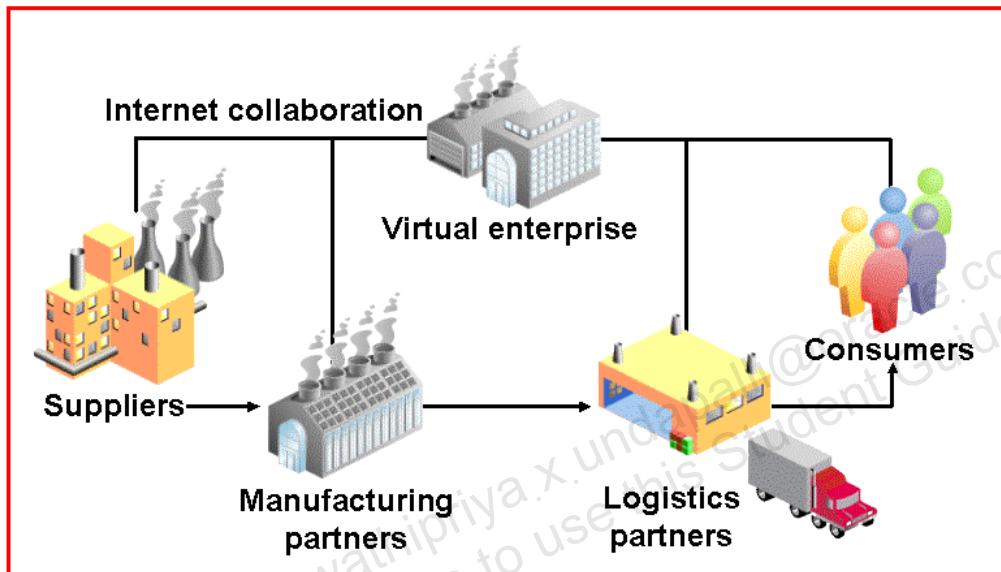
Use Oracle Advanced Supply Chain Planning to balance supply and demand across your supply chain with:

- A plan that respects constraints
- A schedule that meets your organization's objectives

## Oracle Advanced Supply Chain Planning Features

### Oracle Advanced Supply Chain Planning Features

#### Holistic Planning and Scheduling



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#### Oracle Advanced Supply Chain Planning Features: Holistic Planning and Scheduling

Oracle Advanced Supply Chain Planning has 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. Supply chain partners have real-time access to view their supply and demand positions across all internal and external facilities and locations.

A constraint-based, optimized plan for all planning horizons, materials, resources, supply chain partners, and manufacturing modes is enabled by:

- A common data model for planning and execution enables companies to aggregate data at multiple levels
- Flexible controls to define the granularity of the plan
- Support for mixed-mode manufacturing, enabling a company to create a single plan consolidating requirements across the company, regardless of production method
- Integrated planning and execution to create a single closed-loop plan
- Supported integration with legacy systems and previous Oracle application releases

- 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

### Oracle Advanced Supply Chain Planning Features

#### Optimization:

- **iLOG solver and optimization technology automates decision making:**
  - Optimizes plans to strategic objectives
  - Generates coordinated sourcing, production, and distribution plans for supply chain partners
  - Recommends alternate suppliers, components, routings, and resources
- **Incorporated with third-generation memory-based planning**

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#### Oracle Advanced Supply Chain Planning Features: Optimization (continued)

The Oracle Advanced Planning System employs advanced solver and optimization techniques built with components supplied by iLog.

#### Optimization Benefits

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.

- 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

### Oracle Advanced Supply Chain Planning Features

#### Optimization objectives

- Maximize inventory turnover ratio
- Maximize plan profit
- Maximize on-time delivery



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#### Oracle Advanced Supply Chain Planning Features: Optimization (continued)

During plan definition, Oracle Advanced Supply Chain Planning provides a method for the user to weight the importance of optimization objectives on a scale from zero to one.

- When product life cycles are short, the risk of obsolescence plan should maintain low inventories and high inventory turnover ratios.
- When some demand is not profitable and corporate policy allows some demand to go unfulfilled, plan profit determines whether to work overtime to fulfill marginally profitable demand.
- In an environment where on-time delivery is a competitive advantage, the third objective should be weighted heavily.

## Oracle Advanced Supply Chain Planning Features

### Oracle Advanced Supply Chain Planning Features

#### Planner Workbench:

- **Decision-support tool**
- **Flexible, intuitive, and easy to use interface**
- **Navigation paths to related information**
- **Designed to streamline common activities of planners**



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#### Oracle Advanced Supply Chain Planning Features: Planner Workbench

Planners use Planner Workbench for many of their analysis and execution tasks.

#### Planner Workbench features 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
- Horizontal plan pivot tables display plans by period, by week and by day

#### Planner Workbench benefits are:

- It is organized to streamline the common activities of planners. The flexible, intuitive and easy-to-use user interface has been redesigned and updated to streamline the common activities of planners. You can use zoom, resize, and right-mouse menu features to tailor

the display to emphasize information that is important to you and to provide quick and easy access to frequently used information.

- It provides information to help you diagnose problems. You can run what-if simulations and then compare the results against other simulations and against performance targets before you decide which alternative to implement.
- Increase system efficiency
- Improve user productivity
- Use fewer keystrokes for common actions
- Achieve higher customer satisfaction
- Achieve lower cost to the organization

### Oracle Advanced Supply Chain Planning Features

#### Simulation:

- Quickly simulate plans with modified parameters (item simulation sets, plan options)
- Use key performance indicators (KPIs) to evaluate alternate plans:
  - Inventory turnover
  - On-time delivery
  - Plan profit
  - Resource utilization
- Graphical KPI display



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#### Oracle Advanced Supply Chain Planning Features: Simulation

Using advanced simulation capabilities, plans generated by Oracle Advanced Supply Chain Planning can be quickly reviewed and compared to other plans. Key performance information provided with Oracle Advanced Supply Chain Planning includes inventory turnover, on-time delivery, plan profit, and resource utilization.

The benefit of simulation is that, by integrating performance management capabilities, supply chain plan performance can be measured and evaluated based upon graphical display of key performance indicator information.

### Oracle Advanced Supply Chain Planning Features

#### Integrated Performance Management:

- Multiplan KPI comparisons
- Multiplan exception comparisons
- Integration with Oracle Workflow:
  - Notification and corrective action alerts



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#### Oracle Advanced Supply Chain Planning Features: Integration with Performance Management System

The planning system is integrated with the Oracle Business Intelligence System (BIS). 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.

The benefits of integrated performance management are:

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

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## Oracle Advanced Supply Chain Planning Features

### Oracle Advanced Supply Chain Planning Features

#### Supporting all manufacturing methods in mix mode:

- Oracle Discrete Manufacturing
- Oracle Project Manufacturing
- Oracle Flow Manufacturing
- Oracle Process Manufacturing
- Oracle Shopfloor Management (OSFM)

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#### Oracle Advanced Supply Chain Planning Features: Mixed Mode Planning

Oracle Advanced Supply Planning supports mixed mode manufacturing which lets you plan distribution and manufacturing operations for hybrid environments. You can plan for the full range of discrete, repetitive, process, project, and flow manufacturing environments. You can also plan to make to stock, make to order, assemble to order, and configure to order products simultaneously, using a single plan across all methods. This features enables you to use the most efficient process to build each product.

Mixed mode manufacturing is supported by the following combination of Oracle Applications: Oracle Bills of Material (for discrete manufacturing), Oracle Flow Manufacturing, Oracle Project Manufacturing, and Oracle Process Manufacturing. These serve primarily to provide process plan (routing) data to the Oracle Advanced Supply Chain Planning engine. They also provide the user interfaces with which users of the different manufacturing modes view the output of the planning process.

#### Oracle Project Manufacturing

Oracle Project Manufacturing is designed to support companies that manufacture products for projects or contracts. It provides robust project tracking, billing, and budgeting. You can plan in a project or contract environment by segmenting all sources of supply and demand by

project. This allows the planning process to identify components as shared or project specific, track existing inventories by project, and provide visibility to all supply and demand associated with the project.

Oracle Project Manufacturing also supports Seiban production, the Japanese management practice. The word sei means production, and the word ban means number, thus implying a production number. A manufacturing plan is therefore managed by a Seiban number. All demand and supply for the manufacturing plan is associated with the Seiban number (via its project number).

Oracle Project Manufacturing is also designed for engineer-to-order (ETO) environment and a assemble-to-order environment. This enables a manufacturer to track supply and demand with a particular product, project, or customer.

Oracle Advanced Supply Chain Planning supports Oracle Project Manufacturing through Project Planning.

## **Oracle Flow Manufacturing**

Oracle Flow Manufacturing is a demand driven production system with balanced production lines and processes designed to produce a constantly changing mix of products at a steady rate. Flow manufacturing uses schedules for mixed model production instead of work orders to drive production. The mixed model schedules are sequenced based on scheduling rules and material is replenished, or pulled through the sequence, using kanbans.

This is in contrast to a traditional discrete environment where the master production schedule and material requirements plan are used to explode requirements and create planned orders that are converted into purchase orders and work orders. There are some cases in which Oracle Advanced Supply Chain Planning may be used effectively. For example, you have a seasonal business, and you use Oracle Advanced Supply Chain Planning to create planned orders during your slow period to build up inventory to satisfy your peaks in demand. In these cases, planned orders may be converted into flow schedules.

When there is a hybrid of manufacturing methods, for example if a flow manufacturing system feeds to a discrete manufacturing plant, Oracle Advanced Supply Chain Planning may be used effectively, because Oracle Advanced Supply Chain Planning can consider a flow schedule as a supply.

## **Oracle Process Manufacturing**

The Oracle Process Manufacturing (OPM) user is fully integrated with Oracle Advanced Supply Chain Planning and plans based on plan objectives and use the materials and resources optimally.

Oracle Advanced Supply Chain Planning provides an integrated plan for multiple modes of process manufacturing including batch, continuous, and packaging operations. It incorporates formula-based, process unique requirements including co-products, and scaling.

The data used to plan materials and capacity exists in the Oracle Process Manufacturing schema. This data is used by the Oracle Advanced Supply Chain Planning Planning Server. Oracle Advanced Supply Chain Planning uses Inventory, Production, Formula, Planning, and Sales data from Oracle Process Manufacturing and purchasing data from the Oracle e-Business Suite. You can run multiple plans and manage materials and resources. Once satisfied with the plan, it can be executed in the Production Module.

## Oracle Shopfloor Management (OSFM)

Oracle Shop Floor Management is a module which bridges planning and execution systems. It provides the following capabilities:

- Manage Complex shop floor lot transactions
  - Lot split and merge
  - Update of lot name, product, routing, quantity
  - Bonus lots creation
- Enable dynamic routings
  - Routing determined on the fly
  - Routing movements enforced based on legal next operations
  - Jumps allowed to any operation
- Provide end-to-end genealogy of your products
  - Product tracking all the way back to raw material
  - Forward and backward genealogy surfing
- Model and track operation yield based cost for your products.
  - Operation level yields
  - Yielded cost of product
  - Cost variance at operations
- Enable integration of ERP with third-party MES systems: Seamless integration with Oracle Applications
- Co-Product modeling

## Topic Overview: Plan Types

### Topic Overview: Plan Types

- **Unconstrained**
- **Constrained**
  - Enforce capacity constraints
  - Enforce demand due dates
  - Decision rules
- **Optimized**



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#### Plan Types

A plan type is a way of performing material and capacity planning. Each way meets certain outcomes of Oracle Advanced Supply Chain Planning and may not meet others.

An important implementation task is to determine the level of planning outcomes appropriate for your organization and to use the appropriate plan type. As needed, you can work to move your organization towards achieving more of the outcomes.

## Unconstrained

**Unconstrained**

Balanced supply and demand...

...across the supply chain

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### Unconstrained

The planning run generates an unfeasible plan that overloads manufacturing, supplier, and transportation capacity.

An iterative process follows; the planner manually shifts orders and reruns the material plan until it is feasible.

## Constrained

**Constrained**

Balanced supply and demand...

...across the supply chain

Respects constraints...

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### Constrained

The planning run generates a plan that does not violate the manufacturing, supplier, and transportation constraints that you select.

You instruct the planning engine how to resolve difficult situations by specifying an enforced constraint:

- **Enforce capacity constraints:** Violate demand due dates if necessary to respect capacity constraints. Resources are loaded to their limit to satisfy demand due dates. Unsatisfied demands are pushed to later dates that miss their due dates. The planning engine issues exception messages indicating which demands will be filled after their due dates.
- **Enforce demand due dates:** Violate capacity constraints if necessary to respect demand due dates. Resources are overloaded to satisfy demand due dates. The planning engine issues exception messages indicating the overloaded resources.

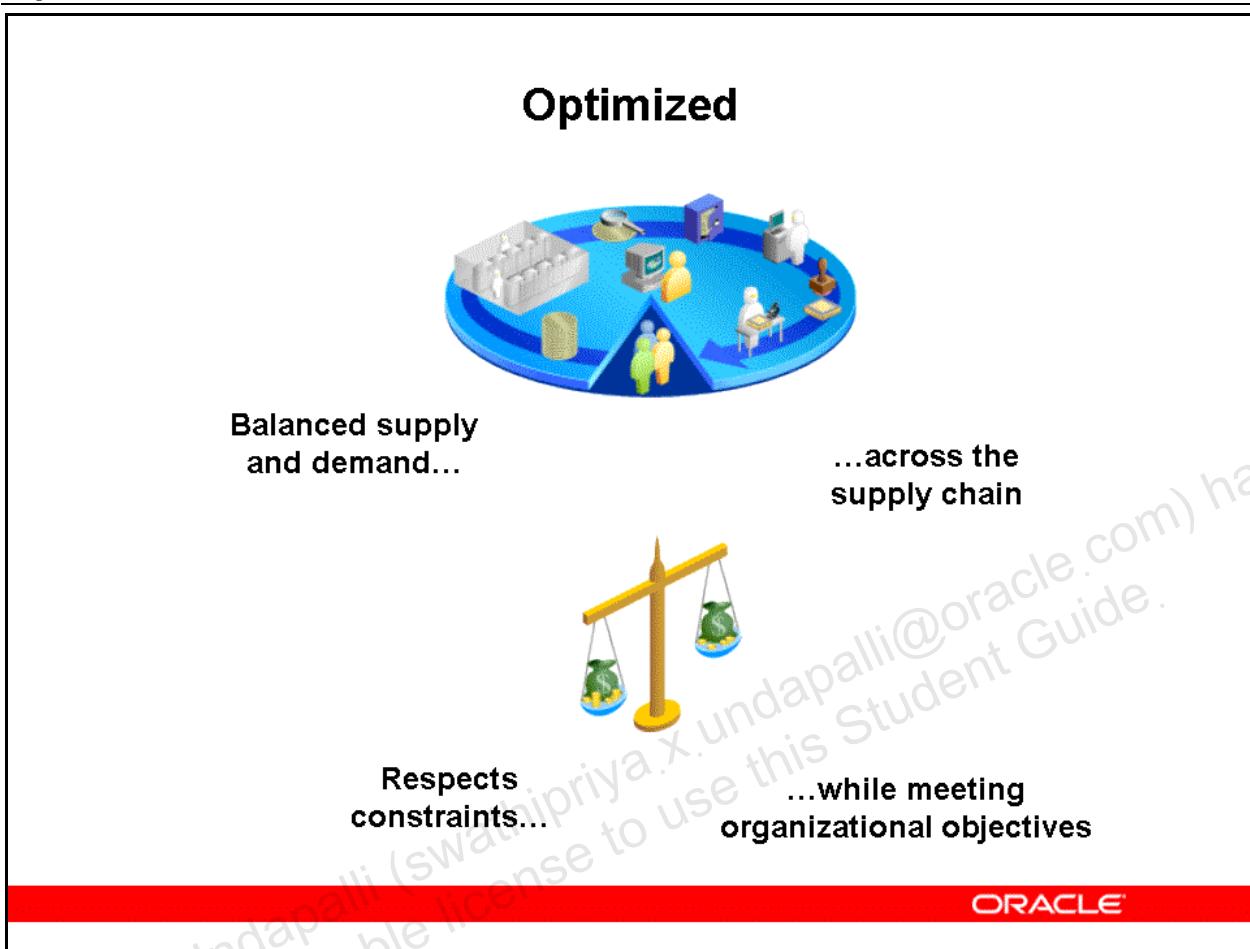
Decision rules are additional instructions to the planning engine to use substitute items and alternate bills of material and routings to produce the supply with fewer constraint violations. They apply under either enforced constraint.

You can enforce only one of these two constraints in a plan; the other constraint is the non-enforced constraint. Non-enforced constraints do not restrict the solution, they result in exception messages if the planning engine needs to violate them.

Typically, we refer to enforce capacity constraints plans as feasible plans because they are plans that:

- Have the detail to schedule the shop floor
- You can execute without overloading resource, supplier, and transportation capacities

## Optimized



### Optimized

The planning run generates a constrained plan with either enforced constraint. Many solutions can satisfy the constraints; optimized planning chooses the solution that results in the most desirable cost outcome for your organization.

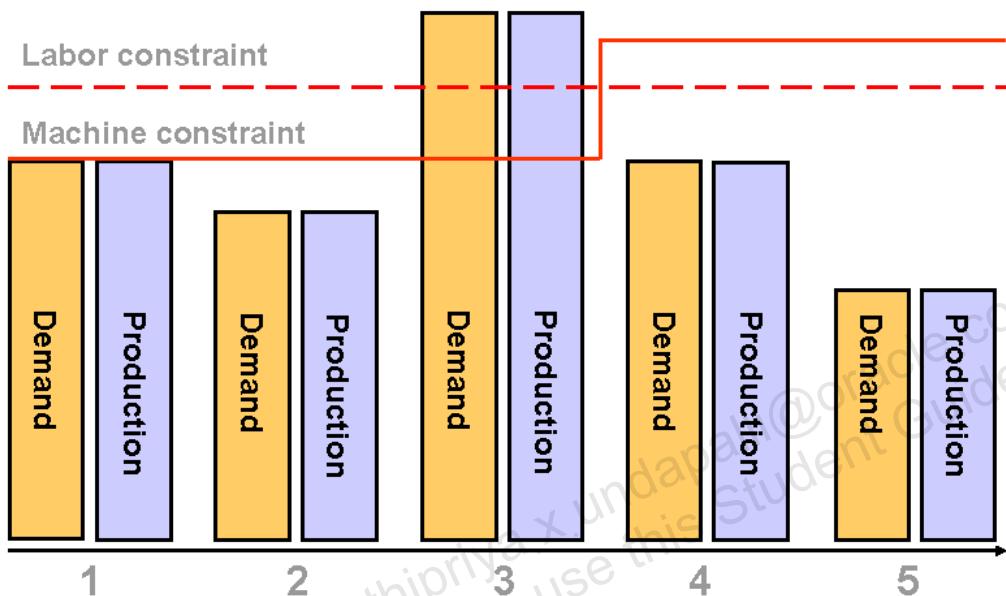
We sometimes refer to the optimized plan type as performing cost-based optimized planning.

The cost outcomes are:

- Best customer service
- Minimum inventory investment
- Greatest profit

## Plan Class Example: Unconstrained

### Plan Class Example: Unconstrained



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### Plan Type Example: Unconstrained

Unconstrained planning is the traditional material requirements planning and capacity requirements planning (MRP/CRP) explosion of the master production schedule (MPS). This planning aligns supply quantities and due dates with demand quantities and need dates. It calculates time-phased net requirements for every part and generates a replenishment plan based on assumed infinite material and resource availability.

Unconstrained plans generate supply (planned orders) due at the same time period that demand occurs. Exception messages report when material and resource capacity have been exceeded, but orders are not automatically realigned to satisfy these constraints.

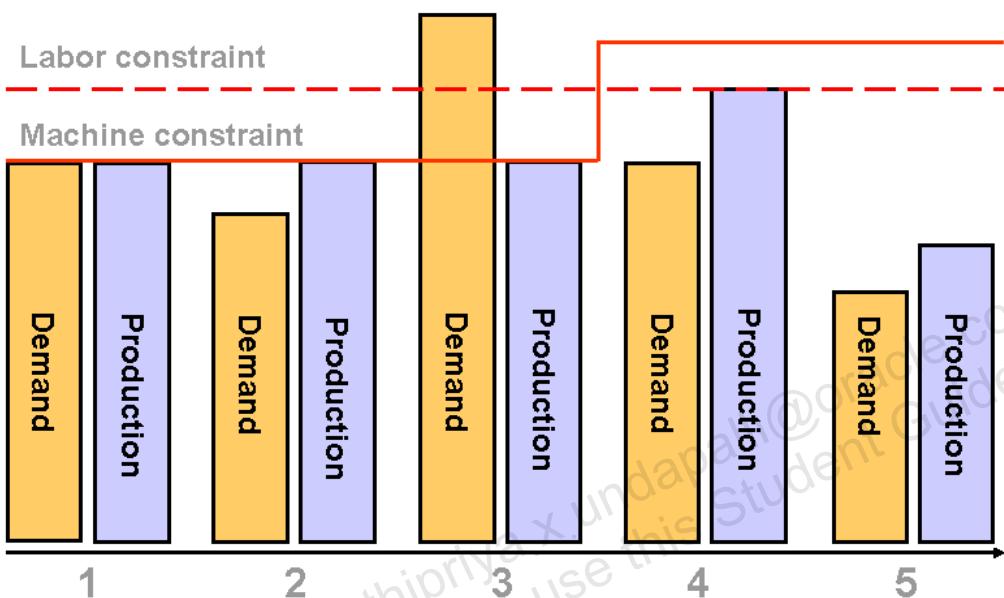
In the figure, the machine capacity paces production for the first three time periods. Machine resource capacity is increased at the end of the third period. Then in the fourth and later time periods, labor becomes the limiting resource.

With unconstrained planning, planned production in each time period is matched with demand, unless a production lot sizing rule or a planning time fence causes a temporary imbalance. In the third time period, planned production exceeds capacity. MRP/CRP exception messages would indicate this condition. The planner probably would consider manually shifting some orders to a later production period to reduce the workload in period 3, and perhaps rerun the

MRP/CRP calculation to see whether the change causes an overload elsewhere in the production system.

## Plan Type Example: Constrained

### Plan Type Example: Constrained



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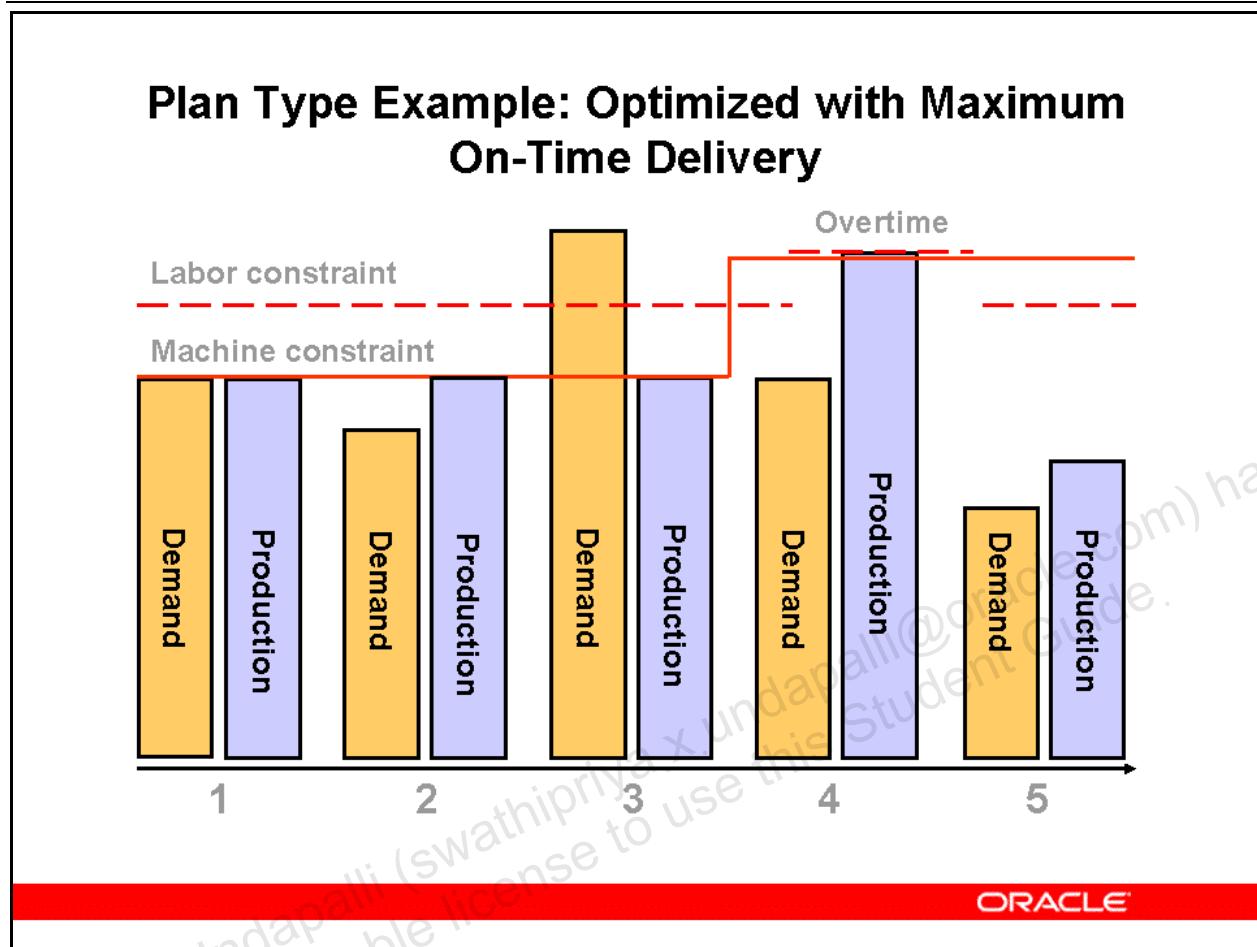
### Plan Type Example: Constrained

Constrained planning creates a feasible, though not necessarily optimal, production plan.

- In the first time period, the demand and supply are equal to the machine capacity.
- In the second time period, production continues to be paced by the machine capacity constraint. Supply in this period exceeds demand, because CBP is accumulating inventory for use during the next time period, in which demand substantially exceeds supply.
- In the third time period, production is again limited by the machine constraint. Not enough inventory was built up during the second period to completely cover the excess demand. Since it is impossible to meet this demand within the constraints, an order backlog occurs.
- Additional machine resources become available in the fourth time period. Production is now limited by labor availability. Demand is less than supply. So some of the backlog is worked off, but not all of it.
- In the fifth time period, the remainder of the order backlog is worked off. Production is not constrained by either labor or machine constraints. To produce at capacity in this time period would create inventory that might not ever be sold. The figure does not show enough planning horizon to see whether inventory should be accumulated for a future peak of demand.

In this situation, avoiding any backlog would be difficult, because it would require increasing machine capacity in the short term. That is unlikely to be feasible. By working overtime in the fourth period, production could be increased to work off the backlog more quickly. This is a what-if alternative that could be simulated by increasing the work hours for the labor resource.

## Plan Type Example: Optimized with Maximum On-Time Delivery



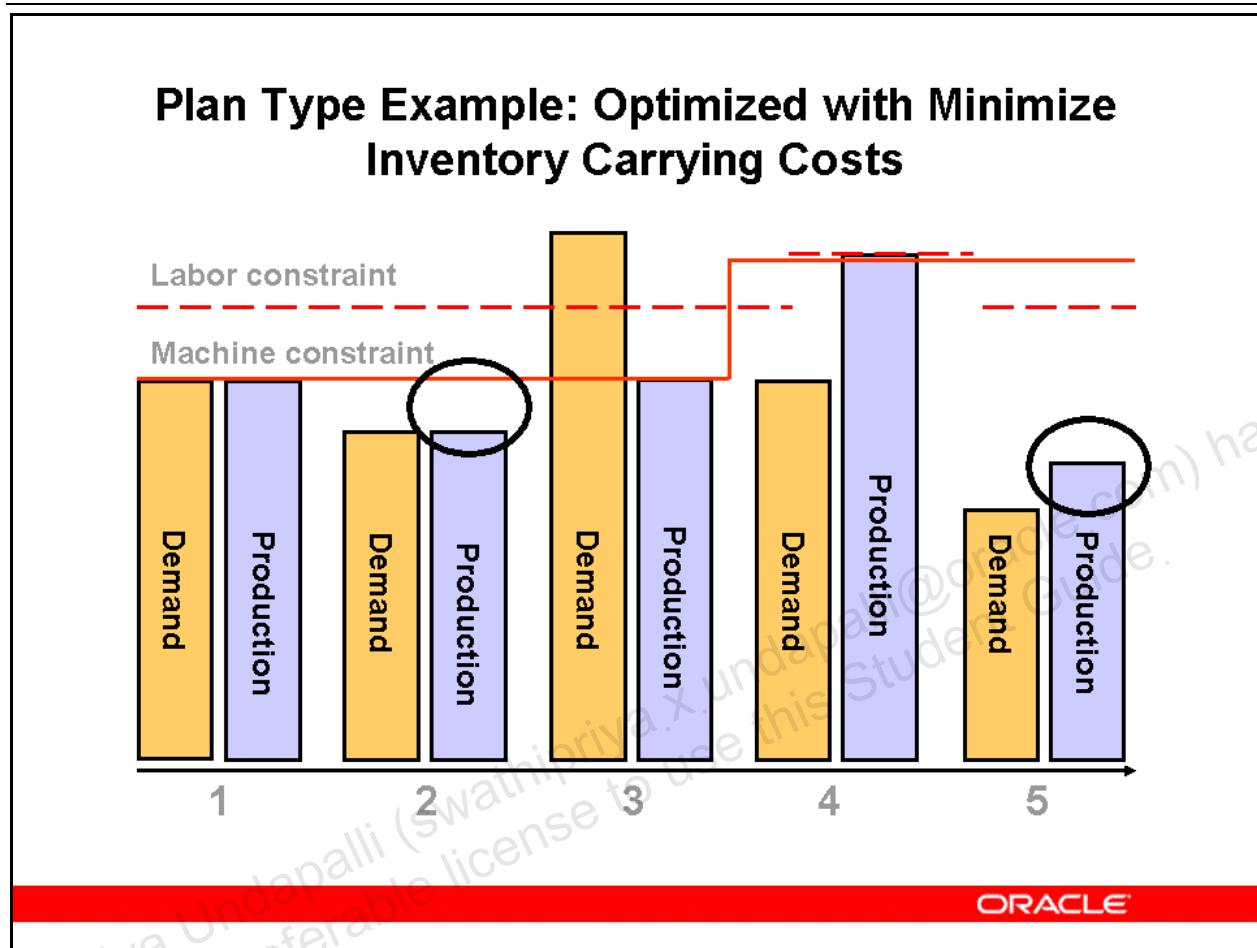
## Plan Type Example: Optimized with Maximum On-Time Delivery

Optimization seeks the production plan that best meets the objective criteria. For this example, say that on-time delivery is a heavily weighted, important objective. Also assume that the penalty for late supply (backorders) is higher than the penalty for exceeding resource capacity (overtime). Optimization evaluates these and other trade-off costs.

For the first three periods in this example, there is no difference between the optimized plan and the constraint-based plan. A backlog occurs in the third period because the hard machine constraint makes it impossible to meet the peak demand in period 3.

However, production in the fourth time period is greater than that shown in the constrained example. In the constrained example, some of the period 3 demand was backordered and not filled until period 5. Optimization weighs the cost of overtime labor in the fourth period against the cost of carrying the backlog into period 5. If the backlog quantity is large, if the customer is likely to balk at a two-time-period delay, and if the cost of overtime is relatively low, optimization might suggest the solution shown in the figure—work overtime in the fourth period to reduce the backlog as soon as possible.

## Plan Type Example: Optimized with Minimize Inventory Carrying Costs



## Plan Type Example: Optimized with Minimize Inventory Carrying Costs

The figure shows what would happen if the optimization objective were changed from maximize on-time delivery to maximize inventory turns. Instead of producing inventory in the second time period, optimization would delay that production until the fifth time period. This would ensure that inventory was not stored. It would maximize inventory turnover ratio, but on-time delivery and customer service would suffer.

There is only one optimal solution for each given set of objectives and penalty factors. However, you can simulate alternate plans using an almost infinite number of combinations of objectives and penalty factors.

## Plan Type Scenario

### Plan Type Scenario

Sales Orders	Planning Period			
	Day 1	Day 2	Day 3	Day 4
Priority 1, \$1.00	25	25		
Priority 2, \$2.00	75	75		
Supply constraint				
Material capacity	50	50	50	50
Resource capacity	60	60	60	60

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### Plan Type Scenario: Overview

This set of examples uses simplified data to draw out the differences between unconstrained, constrained, and optimized planning.

Assume that the sales orders are for the same items and that material and resource capacity is expressed in units per day for the item ordered. An unusual situation is assumed where the higher priority sales order (priority 1) has a lower sales price per unit (\$1.00).

## Plan Type Scenario

### Plan Type Scenario

Sales orders	Planning Period			
	Day 1	Day 2	Day 3	Day 4
Priority 1, \$1.00	25	25		
Priority 2, \$2.00	75	75		
Supply constraint				
Material capacity	50	50	50	50
Resource capacity	60	60	60	60
Planned supply				
P1 Order, \$1.00	25	25		
P2 Order, \$2.00	75	75		

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#### Plan Type Scenario: Unconstrained

Unconstrained plans will generate supply (planned orders) due at the same time as the demand need date. You will receive exception messages alerting you when material and resource capacity have been exceeded. This example shows that the planned supply quantities and due dates are aligned with the demand quantities and need dates.

## Plan Type Scenario

### Plan Type Scenario

Sales orders	Planning Period			
	Day 1	Day 2	Day 3	Day 4
Priority 1, \$1.00	25	25		
Priority 2, \$2.00	75	75		
Supply constraint				
Material capacity	50	50	50	50
Resource capacity	60	60	60	60
Planned supply				
P1 Order, \$1.00	25	25		
P2 Order, \$2.00	25	25	50	50

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### Plan Type Scenario: Constrained - Enforce demand due dates

A plan can be constrained by material only by setting the Plan Options form > Aggregation tab > Capacity Constraints section >:

- Material Constraints field to Yes
- Resource Constraints field to No

In this example, daily production is limited by the material constraint to 50 units per day.

Constrained but non-optimized plans respect order priorities, even though plan profit could be increased by filling higher-revenue but lower-priority orders first.

## Plan Type Scenario

### Plan Type Scenario

Sales orders	Planning Period			
	Day 1	Day 2	Day 3	Day 4
Priority 1, \$1.00	25	25		
Priority 2, \$2.00	75	75		
Supply constraint				
Material capacity	50	50	50	50
Resource capacity	60	60	60	60
Planned supply				
P1 Order, \$1.00	25	25		
P2 Order, \$2.00	35	35	60	20

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### Plan Type Scenario: Constrained - Enforce capacity constraints

A plan can be constrained by material only by setting the Plan Options form > Aggregation tab > Capacity Constraints section >:

- Material Constraints field to No
- Resource Constraints field to Yes

In this example, daily production is limited by the resource constraint to 60 units per day.

You will receive exception messages notifying you that material capacity has been exceeded. You will also receive exception messages notifying you that the priority 2 sales orders are backordered.

## Plan Type Scenario

	Planning Period			
	Day 1	Day 2	Day 3	Day 4
Sales orders				
Priority 1, \$1.00	25	25		
Priority 2, \$2.00	75	75		
Supply constraint				
Material capacity	50	50	50	50
Resource capacity	60	60	60	60
Planned supply				
P1 Order, \$1.00				50
P2 Order, \$2.00	50	50	50	

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### Plan Type Scenario: Optimized

In this example, we assume that both Material Constraints and Resource Constraints are set to Yes, the Optimization check box is checked, and the maximize plan profit objective is heavily weighted.

Daily production in this example is limited by material to 50 units, because material capacity is less than resource capacity. With optimization, the priority of the orders can be overridden if optimization sees a way to come closer to meeting the optimization objectives. In this example, order priority is violated because plan profit can be increased by filling the priority 2 orders before the priority 1 orders.

## Topic Overview: Implementation Progression

### Topic Overview: Implementation Progression

- **Implementation progression**
- **Benefits of implementing in phases**



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## Implementation Progression

### Implementation Progression

- **Unconstrained plans:** Verify setup
- **Constraint-based plans:** Quick benefits
- **Decision rules:** Consider alternates
- **Optimization:** Continuous improvement

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### Implementation Progression

#### **Unconstrained plans verify setup:**

- Duplicate results of legacy MRP system
- Increase familiarity and confidence

#### **Constraint-based plans provides quick benefits:**

- Generate feasible production plans
- No additional transaction source instance setup is needed

#### **Decision rules consider alternates:**

- Automate selection of alternate items, routings, sources

#### **Optimization leads to continuous improvement:**

- Establish plan objectives
- Set up default penalty factors
- Generate optimized plans
- Refine model based on expected costs and benefits

- Set up penalty factors at detailed hierarchy level
- Simulate and evaluate multiple plans

## Implementation Progression: Unconstrained

### Implementation Progression: Unconstrained

- Create database links to establish communication
- Set up collection programs
- Run collection programs to copy supply chain models to the APS instance
- Define supply chain plan names and plan options
- Launch named supply chain plan

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### Implementation Progression: Unconstrained

An unconstrained supply chain plan does not account for existing capacity limits for material or production resources. The result is a statement of what resources would be needed throughout the supply chain to completely fulfill a given master production schedule. This approach produces the same result as the traditional master production schedule, material requirements planning, capacity requirements planning sequence. It is useful for medium and long range resource requirements planning decision support.

Implementing an unconstrained supply chain plan involves establishing communication links with the transaction source database instances, copying the source setup information to the APS server, and launching the Oracle Advanced Supply Chain Planning programs to generate the supply chain plan.

- Create database links to establish communication between the transaction source instances and the advanced planning and scheduling planning server
- Set up collection programs to specify which instances and information types to collect
- Run collection programs to copy supply chain models from the transaction source instances to the Oracle Advanced Planning and Scheduling (APS) server
- Define a supply chain plan name and options for an unconstrained supply chain plan

- Launch the named supply chain plan

Unconstrained planning is designed to produce identical results as that of a legacy material requirements planning system. This is useful in verifying implementation and in building user confidence with the Oracle Advanced Supply Chain Planning product.

Unconstrained plans generate messages noting the supplier and resource constraints that are exceeded by the plan if both:

- Plan Options window > Aggregation tab > Plan Capacity field is selected
- The violation is sufficient to pass the message filter values specified on the applicable exception set

## Implementation Progression: Constrained

### Implementation Progression: Constrained

- **Constrained planning recognizes constraints during plan generation that otherwise would require manual adjustments and iterations of planning processes**
- **Source instance setup is similar to that for unconstrained supply chain planning**
- **Set plan options to:**
  - Consider material constraints
  - Consider resource constraints
  - Simultaneously consider supplier and resource constraints
  - Consider purchasing lead time constraints

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### Implementation Progression: Constrained

Constrained-based supply chain plans are bound by limits on material and resource availability. Material and capacity constraints can be considered individually or simultaneously.

Implementation for constraint-based planning is the same as implementation for unconstrained planning, plus a small number of additional plan options. Oracle constraint-based planning is designed to produce feasible plans with minimal implementation effort.

Some examples of constraints are:

- **Material constraint:** A supplier can provide up to 500 units of a component item for each day during the time period between June 1 and August 31.
- **Material constraint:** A supplier makes deliveries only on Mondays.
- **Resource constraint:** A work center department has two identical machines that are available every workday from 7:00 am to 3:00 p.m. Routings state how much machine time is consumed during the setup and production of items routed through the work center.
- **Resource constraint:** Transportation of wheat to a seaport is limited by the availability of railroad cars during July.

You can set some constraints as non-enforced--the planning engine tries to respect them but can violate them, if necessary, and create an unfeasible plan. This capability can be very useful

for implementations because you can selectively enforce constraints. For example, if your routing resource usages are not currently exact enough to support accurate planning results and you launch an enforce capacity constraints plan, either the plan would not be executable or would under-utilize shop floor capacity (because the resource usage in the routings are different than what the shop floor can really do). In this case, you can still enable constrained planning but not respect resource constraints since your data cannot support it.

### Implementation Progression: Decision Rules

- Additional instructions
- Substitute items
- Alternate bills of material and routings
- Fewer constraint violations

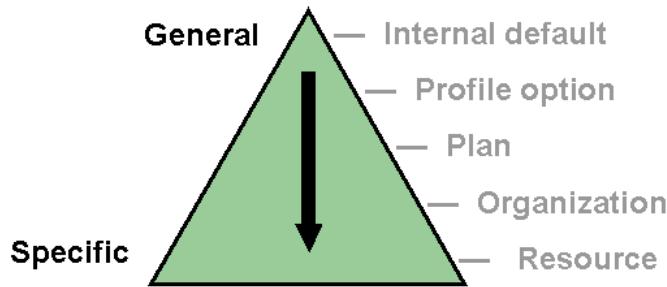
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### Implementation Progression: Decision Rules

Decision rules are additional instructions to the planning engine to use substitute items and alternate bills of material and routings to produce the supply with fewer constraint violations. They apply under either enforced constraint.

## Implementation Progression: Optimized

### Implementation Progression: Optimized



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### Implementation Progression: Optimized

The source instance setup for optimized planning is initially the same as the setup for unconstrained planning. When the implementation progresses to the point of modeling penalty factors at a detailed level of the hierarchy, then some additional setup needs to be made in the source instances. Similarly, the Oracle Inventory Optimization component uses service level information that is initially set up at a default level and can later be refined with detail level data set up in the source instances.

Modeling transportation capacity constraints uses item attribute data that might not have been originally set up, but this is a matter of going back and completing existing fields.

Compared to constraint-based planning, some additional plan options, such as weights for plan objectives and plan-level penalty factors need to be specified. Oracle optimized planning is designed to continually improve plans with ongoing implementation effort.

### Penalty Costs

You can enter penalty cost information in a multi-level hierarchy. The figure shows the five hierarchy levels where you can set up penalty costs for exceeding resource capacity.

Penalty costs set up at a detailed level of the hierarchy override penalty costs set up at more general levels. Implementations typically begin with penalty costs set up at the general level. In

this way the model can be quickly set up to begin return on investment. As time permits, costs can be entered at more detailed levels of the hierarchy to provide a more precise model for the optimization engine.

Generating optimized plans with certain costs set to zero will yield unpredictable results. Optimization requires, as a minimum, that a default cost value is set at the top level for every penalty cost hierarchy.

## Implementation Progression

### Implementation Progression

**The plan profit key performance indicator may decrease as implementation progresses to create better plans, model more costs, and consider more issues.**

- **Purpose of penalty costs is to steer the solution away from undesirable events**
- **Some penalty costs are intentionally inaccurate:**
  - Not derived from cost accounting
  - Motivated by business reasons
  - Penalty costs are relative
- **Plan profit is only loosely related to the financial bottom line**

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### Implementation Progression: Optimized and Plan Profit

Oracle Advanced Supply Chain Planning is not a financial application. During advanced phases of implementing the Oracle Advanced Supply Chain Planning optimization option you will set penalty factors at increasing levels of detail. This tends to improve the precision of the production operations model in these ways:

- Plan profit is not the bottom line: As you refine your models, the effect of implementing additional penalty factors might appear to decrease plan profit. It would be wrong to conclude that by increasing the precision of your planning model you will decrease the financial profitability of your enterprise.
- Penalty costs are relative: The optimization algorithm drives high-cost alternatives out of the solution. By setting penalty costs to reflect social and business priorities, you can motivate the solution to avoid undesirable strategies. As a side-effect of this practice, the reported plan profit is decreased by a collection of artificial penalty costs. Therefore plan profit bears little relationship to financial profits reported to stockholders.
  - For example, item S represent a substitute for item A. Assume the costs for these items are equal. By attaching an artificial penalty to substitute items, the planning solution will be driven to use up item A before employing the substitute item S.

However, when item S is used, the plan profit will decrease by the cost of item S plus the artificial penalty cost.

## Benefits of Implementing in Phases

### Benefits of Implementing in Phases

- **Fast Forward implementations of supply chain planning and constraint-based planning quickly begin return on investment**
- **Analyze costs and benefits before committing to additional implementation phases**
- **Realized benefits pay for advanced implementation phases**

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### Benefits of Implementing in Phases

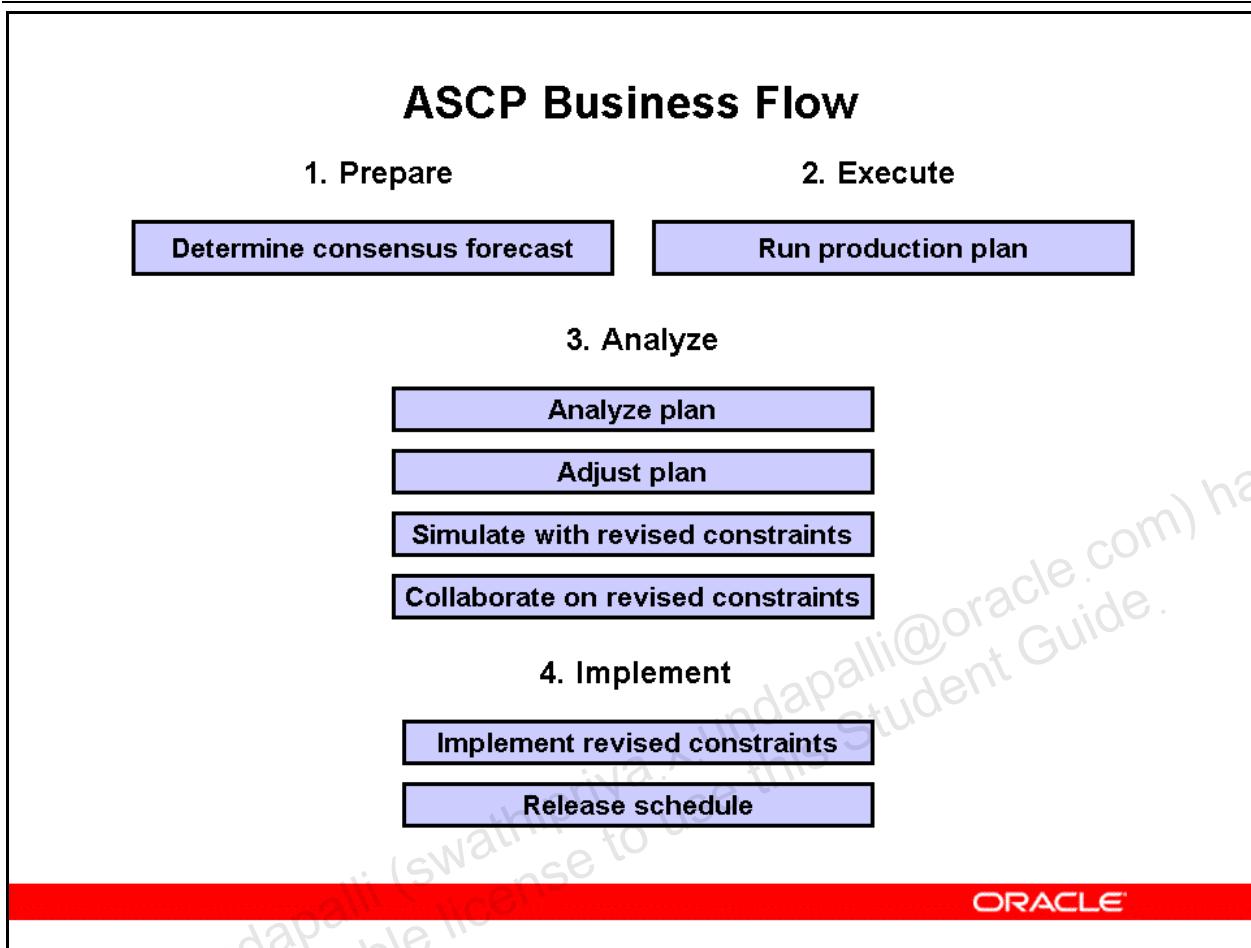
Oracle Advanced Supply Chain Planning can be implemented in a low risk progression. You do not need to invest in new manufacturing applications before implementing Oracle Advanced Supply Chain Planning. You can do a fast implementation and quickly realize some benefits. You can use the savings to fund the next implementation phase. Each implementation project phase presents an opportunity to evaluate costs and benefits of proceeding with the next level of detailed implementation.

### Topic Overview: Planning Business Flow

- **ASCP business flow**
- **ASCP business flow: Prepare**
- **ASCP business flow: Execute**
- **ASCP business flow: Analyze**
- **ASCP business flow: Implement**

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## ASCP Business Flow



## ASCP Business Flow

## ASCP Business Flow: Prepare

### ASCP Business Flow: Prepare

#### 1. Prepare

Determine consensus forecast

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#### Specify Sources of Demand

Maintain forecasts either in:

- Oracle Demand Planning
- Oracle Master Scheduling/MRP

Calculate safety stock level in Oracle Inventory Optimization.

In this step, you can determine postponement and time-phased safety stock levels.

## ASCP Business Flow: Execute

### ASCP Business Flow: Execute

#### 2. Execute

Run production plan

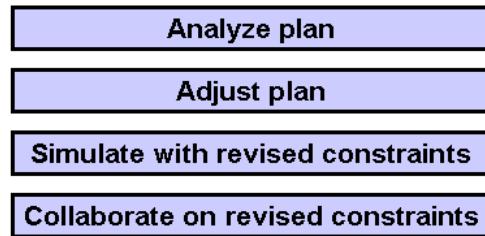
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#### Run Production Plan

Launch the planning engine.

# ASCP Business Flow: Analyze

### 3. Analyze



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#### Analyze Plan

Before releasing orders from the plan, analyze:

- Key performance indicators
- Exception messages

#### Adjust Plan

Make manual adjustments to the plan based on plan review and new information.

For all plan types, change:

- Supply and demand levels
- Manufacturing, supplier, and transportation capacity

For optimized plans, change your optimization objectives.

#### Simulate with Revised Constraints

Run the plan in simulation mode with revised constraints to model potential solutions to limitations.

## Collaborate on Revised Constraints

Collaborate with internal and external parties to agree on revised constraints.

## ASCP Business Flow: Implement

# ASCP Business Flow: Implement

### 4. Implement

Implement revised constraints

Release schedule

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#### Implement Revised Constraints

Implement the revised constraints based on the collaboration results. Implementing the revised constraints by changing information at its source:

- Transaction data, for example, resource hours or routing assigned units
- Forecast quantities in the planning data, for example, sourcing rules or forecast quantities

#### Release Schedule

The planning engine produces a schedule for your production, procurement, and transportation; the schedule consists of planned orders (suggested new supply) and recommendations (suggested changes to supplies). Release them into the transaction data for action.

After release, you may use other functionality to schedule the shop floor, for example, Oracle Manufacturing Scheduling.

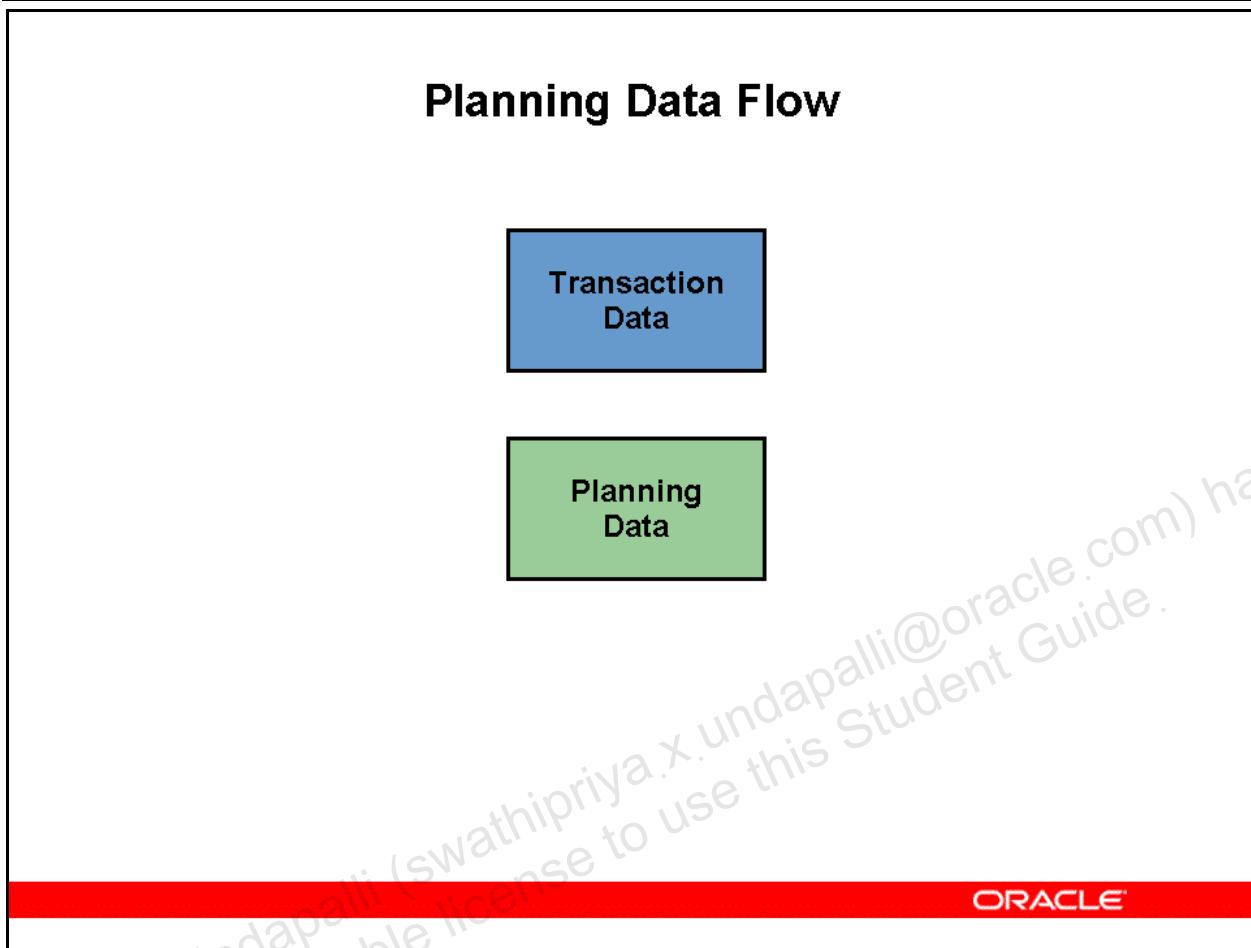
## **Topic Overview: Planning Data Flow**

### **Topic Overview: Planning Data Flow**

#### **Planning data flow**

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## Planning Data Flow



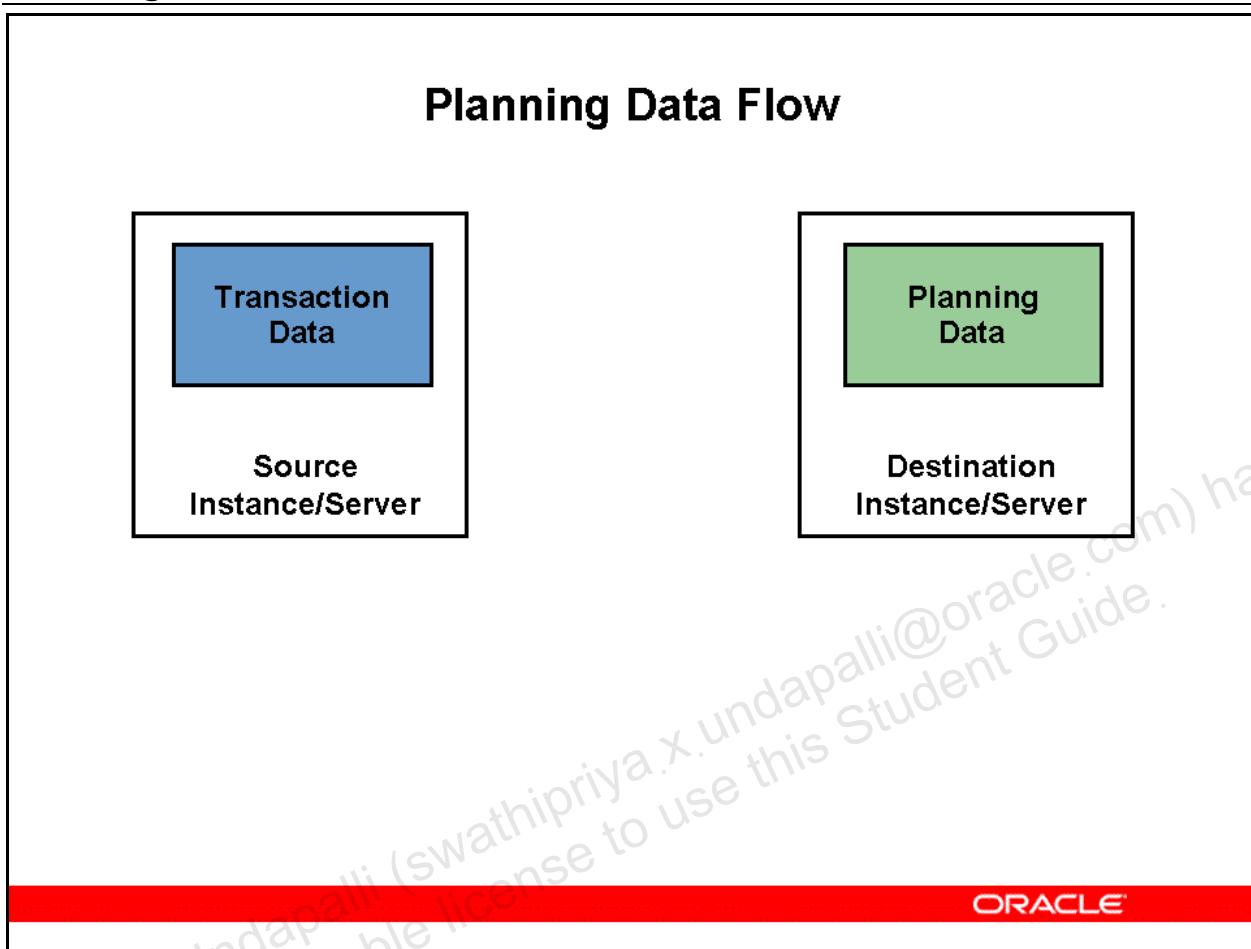
### Planning Data Flow

Oracle Advanced Supply Chain Planning uses two sets of data:

- **Transaction data:** The transaction systems in your facilities. The transaction systems are those that your workers use to duplicate your actual system, for example, entering sales orders and recording inventory receipts.
  - For most users of Oracle Advanced Supply Chain Planning, the transaction data is the collection of Oracle e-Business Suite tables that store data for the Oracle Supply Chain Management execution modules, for example, Oracle Order Management, Oracle Purchasing, Oracle Work in Process, Oracle Bills of Material, Oracle Inventory, and Oracle Costing.
- **Planning data:** The planning system. The system that plans what the transaction systems need to do to meet demand.
  - From a technical perspective, the planning data as a whole resides in two data stores--the planning data store (PDS) and the operational data store (ODS). The term planning data refers to the data in the planning data store and the operational data store.

To perform planning, data must move from the transaction data to the planning data. After planning and evaluation by the planners, changed data moves back to the transaction data.

## Planning Data Flow



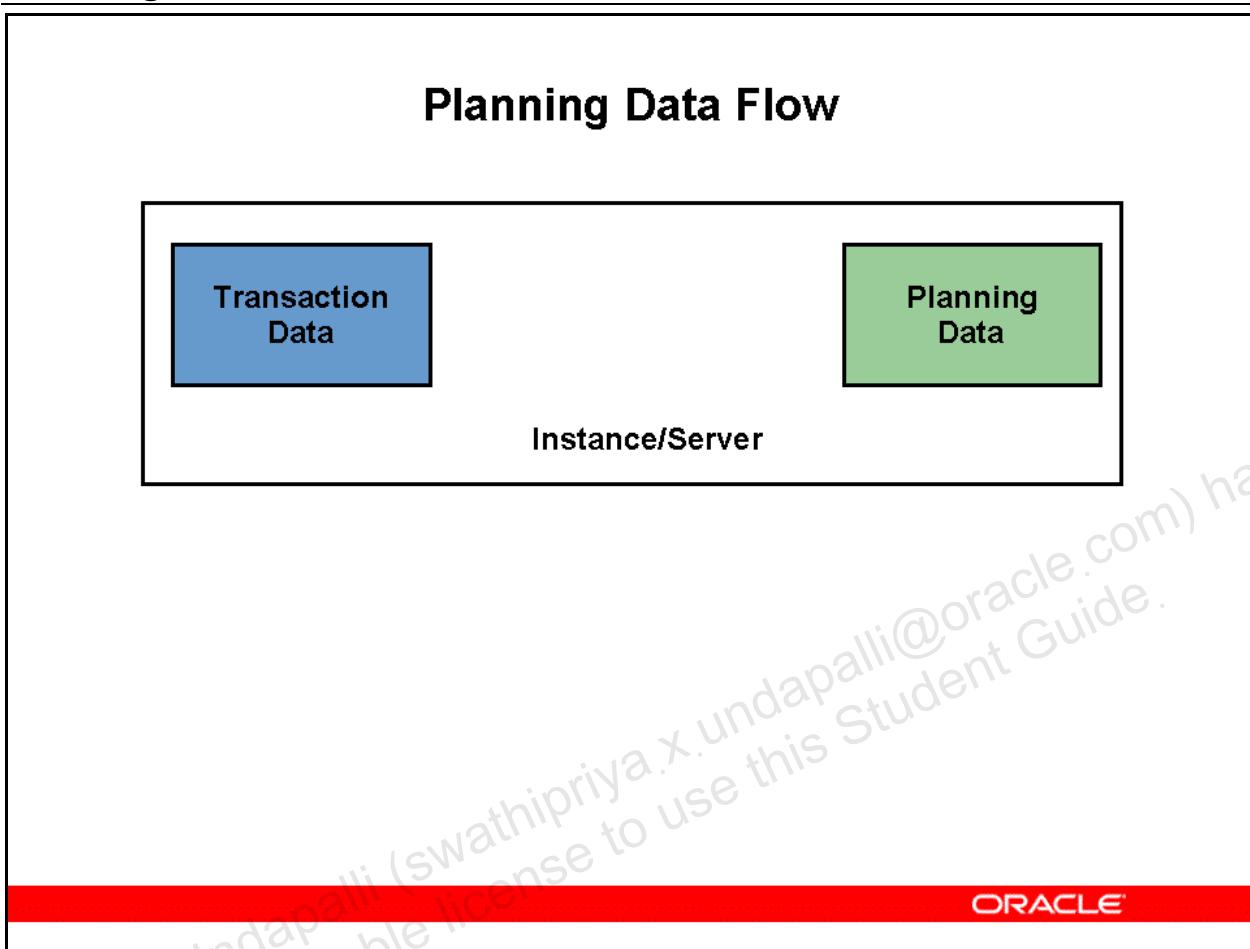
### Planning Data Flow (continued)

In some cases, your organization may make a technical decision to have the transaction data and the planning data on separate instances. An instance is a group of data tables or a schema on a particular computer server.

Very large organizations may use multiple instances because:

- The planning engine is a heavy user of computer processing
- They re-plan frequently
- They have multi-time zone, round-the-clock transaction processing
- They do not want to risk impacting the performance of the transaction systems during planning
- The transaction data may be on a legacy system

## Planning Data Flow



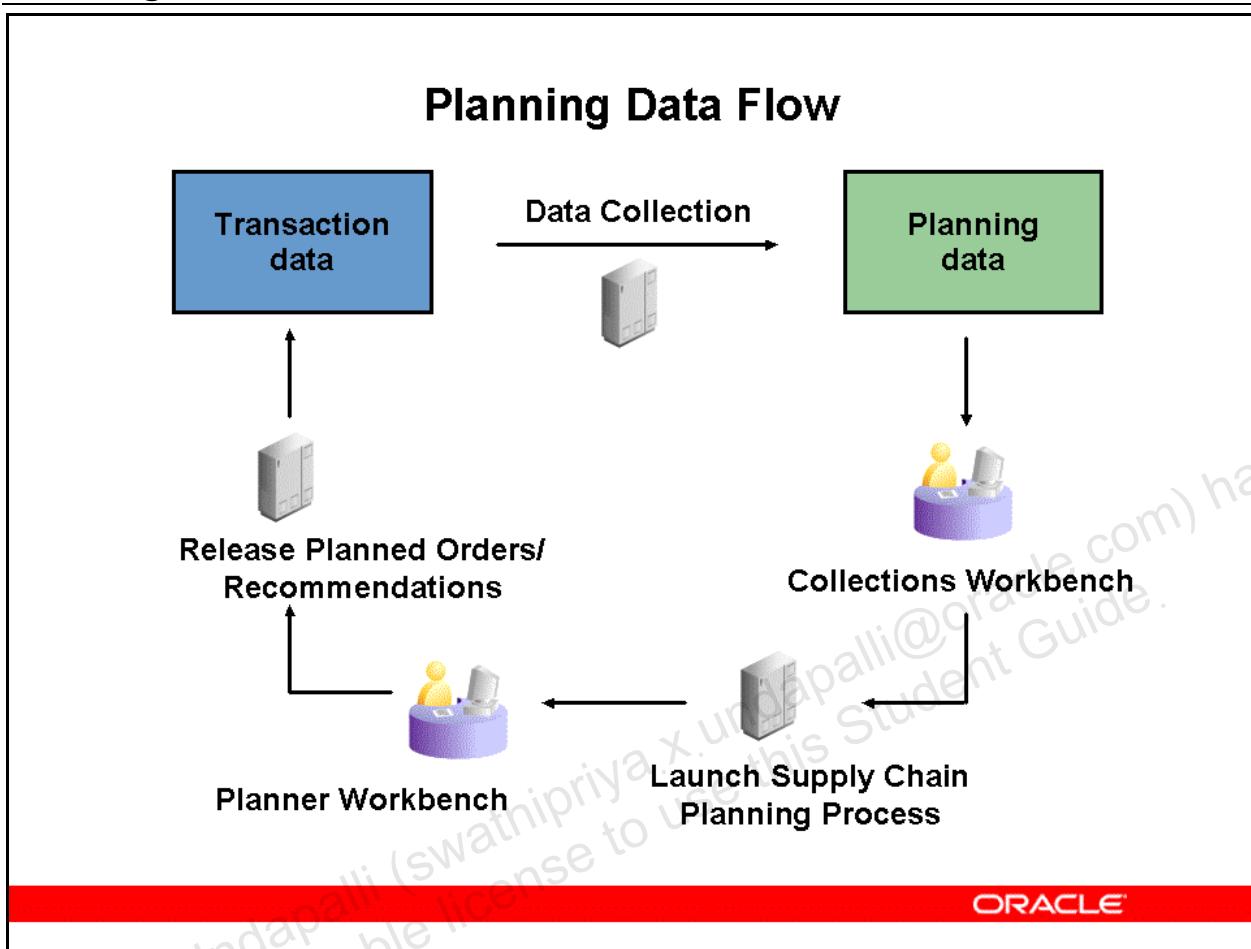
### Planning Data Flow (continued)

In some cases, your organization may make a technical decision to have the transaction data store and the planning data store on the same instance.

Organizations may use a single instance because:

- It is less complicated to maintain technically.
- They do not have the same concerns about performance as organizations who decide to use two instances. They believe that one instance should provide proper performance for the organization.

## Planning Data Flow



### Planning Data Flow (continued)

**Data Collection:** Between launches of the planning engine, you collect the data. Collecting data makes a copy of all or part the transaction data store in the planning data store.

As a planner, you need to be aware of the timing issues involved in data collection. Certain data in the planning data store will or will not match data in the transaction data store depending on your organization's data collection schedules.

**Collections Workbench:** Planners use a collections workbench to review and prepare the collected data for the planning process.

**Supply Chain Plan Process:** Balances supply and demand.

**Planner Workbench:** Planners use a planner workbench to:

- See the recommendations of the planning engine
- See the supporting data used in the planning engine
- Analyze and adjust the results of the planning engine
- Implement the recommendations of the planning engine

**Release Planned Orders/Recommendations:** As the planners implement recommendations in the planning data, they move to the transaction data to be acted upon.

## Summary

### Summary

In this module, you should have learned how to:

- Identify planning business issues
- Describe outcomes of using Oracle Advanced Supply Chain Planning
- Describe plan types
- Describe implementation progression
- Describe planning business flow
- Describe planning data flow

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## **Planning Information and Planner Workbench**

### **Chapter 2**

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## **Planning Information and Planner Workbench**



### **Advanced Supply Chain Planning Fundamentals**

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## Objectives

### Objectives

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

- **Describe data for planning**
- **Describe planner workbench**
- **Describe how to research data for planning**
- **Describe planning results**
- **Describe planner strategies**
- **Copy plans**
- **Research data for planning**

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## Module Overview: Topics

### Module Overview: Topics

- **Data for planning**
- **Planner workbench**
- **Researching data for planning**
- **Planning results**
- **Planner strategies**

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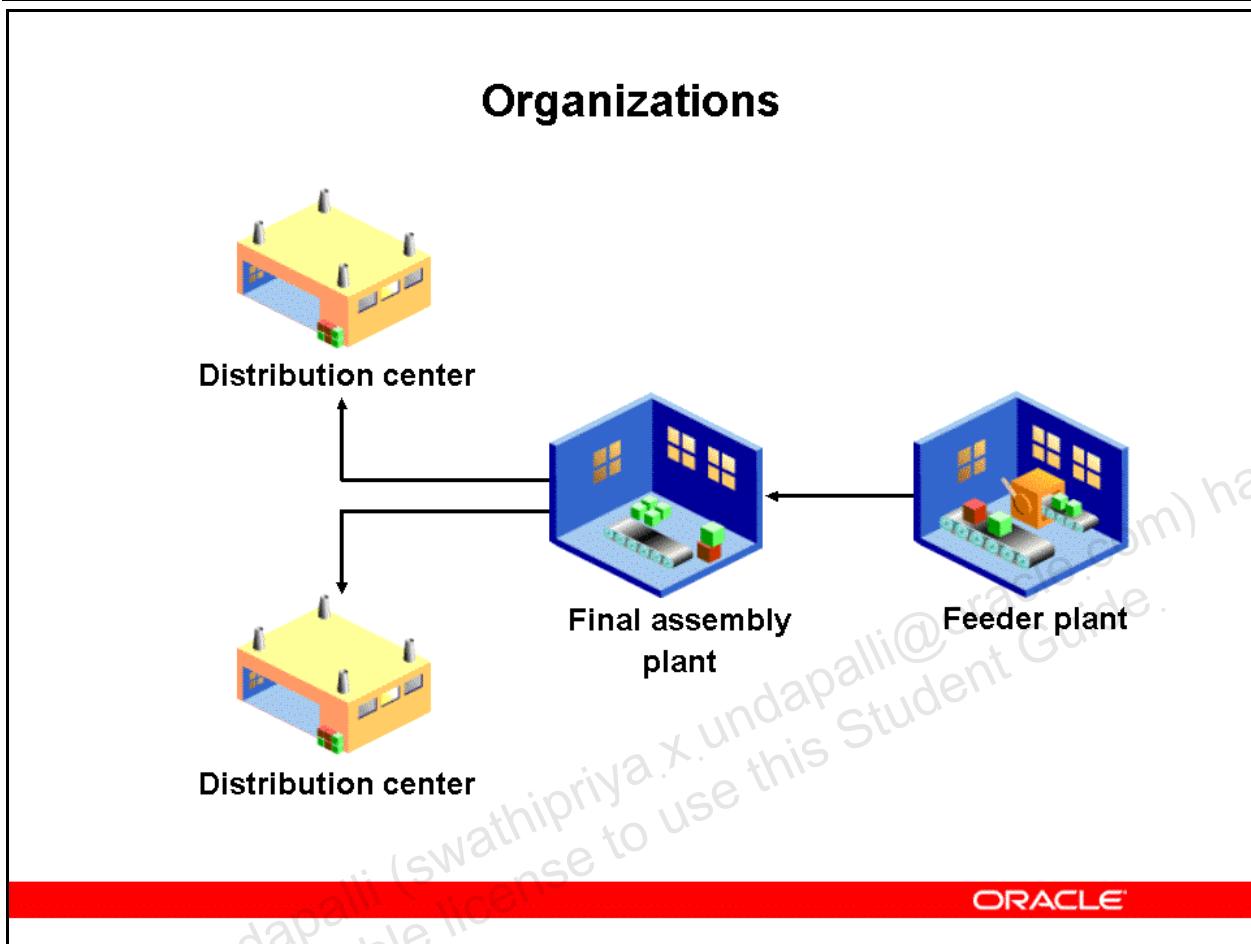
## Topic Overview: Data for Planning

### Topic Overview: Data for Planning

- **Organizations**
- **Items**
- **Bills of material**
- **Resources**
- **Departments**
- **Routings**
- **Workday calendar**
- **Forecasts**

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## Organizations



### Organizations

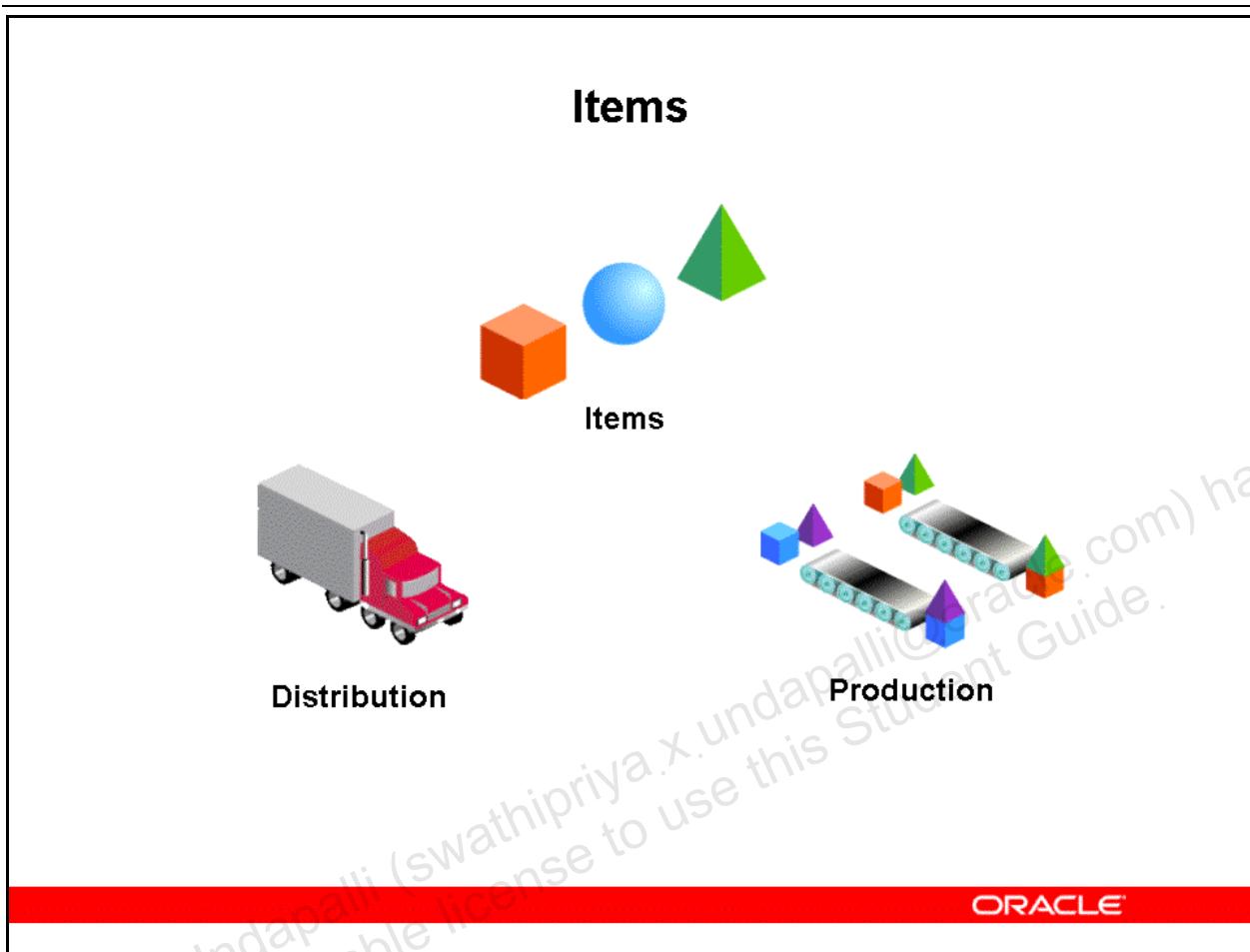
Use organizations to represent your business' facilities or functions.

If your business has a single physical facility that performs two different functions, for example, a manufacturing plant and a distribution center, you might model those as two separate organizations.

If your business has one function located in two separate physical facilities, you might model those as one organization. If you do so, you might create separate subinventories to represent each facility's inventory. Oracle Advanced Supply Chain Planning does not suggest or create transfers between subinventories. If you need these transfers, you might need to model each facility as an organization.

To use certain features of Oracle Advanced Supply Chain Planning, your business might use organizations to represent your customers or suppliers.

## Items



### Items

You use items to represent the material that you use in your manufacturing and distribution processes; material that you purchase, stock, build, sell, and ship.

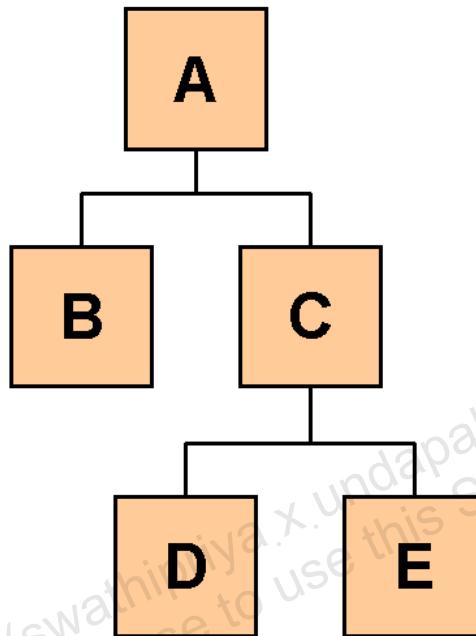
Each item has more than 200 item attributes. Item attributes specify properties of each item. The planning engine takes instruction from many of these item attributes to do its work.

You create items in a master organization and then enable them in the production and distribution organizations that use them.

You set some item attributes at the master organization level and they apply to the item in all organizations that use it. For other item attributes, you can set them at the master organization level but can set different values for them at each production organization.

## Bills of Material

### Bills of Material



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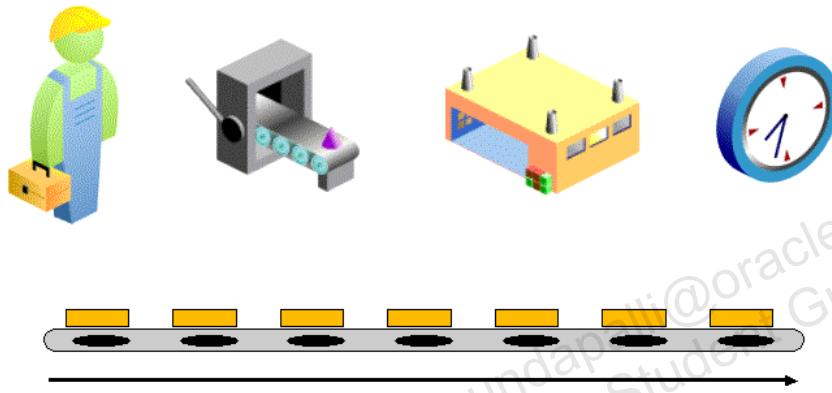
### Bills of Material

You use bills of material to specify the component items that you use to:

- Manufacture assemblies and subassemblies
- Configure sales orders
- Explode aggregate forecasts
- Calculate costs

## Resources

### Resources



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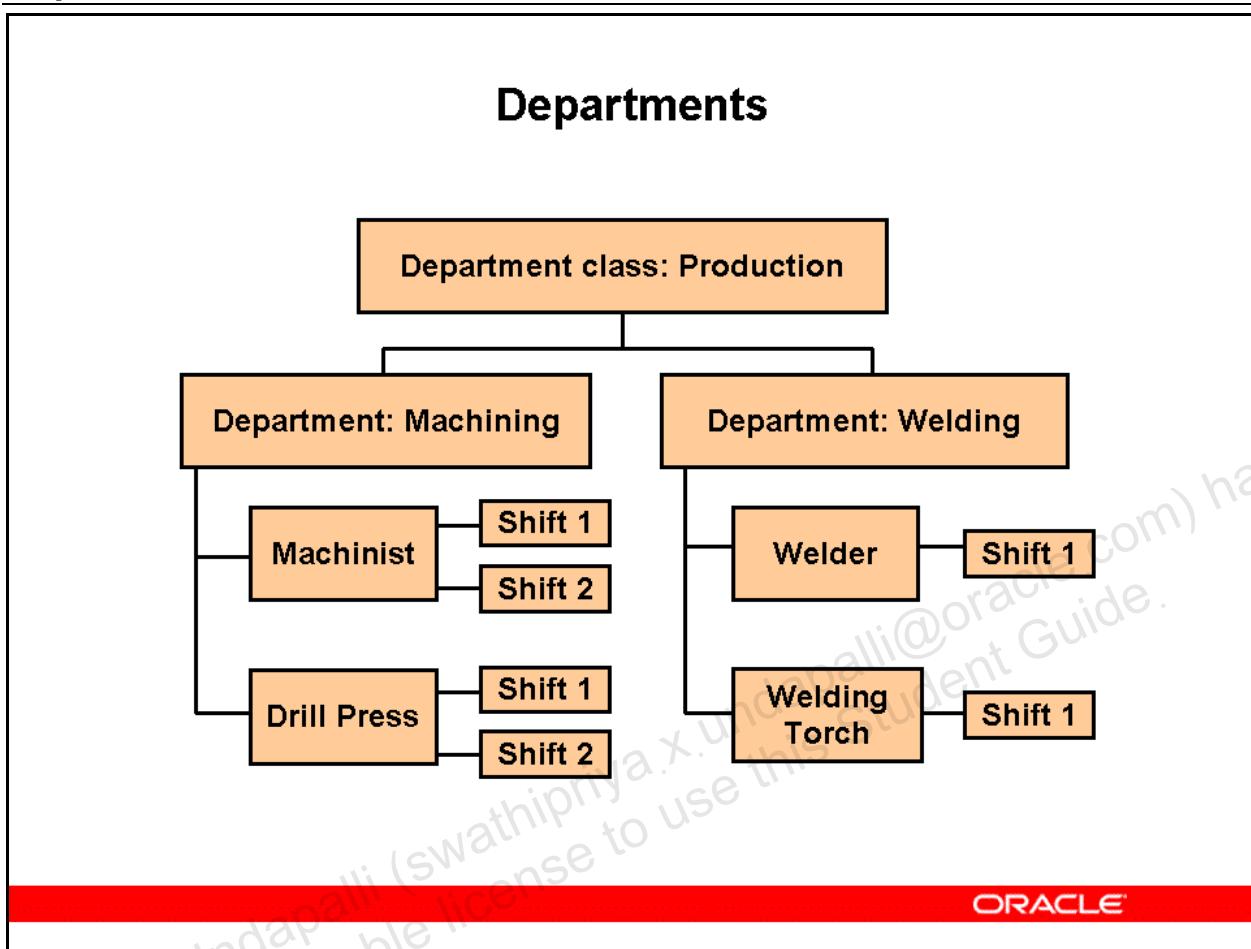
### Resources

Resources are anything, except component material, that you use or need in manufacturing a product. You:

- Identify resources
- Associate them with departments
- State their work shifts
- Insert them into the routings.

Once in the routings, the resources are used for setting item standard costs, scheduling discrete jobs, and planning capacity.

## Departments



### Departments and Department Classes

A department is a collection of resources designed to do certain tasks. For example, you might group the drill presses and machinists into a department. Departments are also called work centers.

A department class is a collection of departments. For example, you might group the welding, machining, plating, and painting departments into the manufacturing department class, and you might group the unit test and final test departments into the quality department class.

### Resources, Departments, and Shifts

You must assign a resource to one department, and you may share that resource with other departments.

A shift represents a period of time during which a resource is available for work. You specify the times for your shifts in the workday calendar. When you assign the resource to its department, you specify the shifts that the resource works.

## Workday Calendar

### Workday Calendar

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

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### Workday Calendar

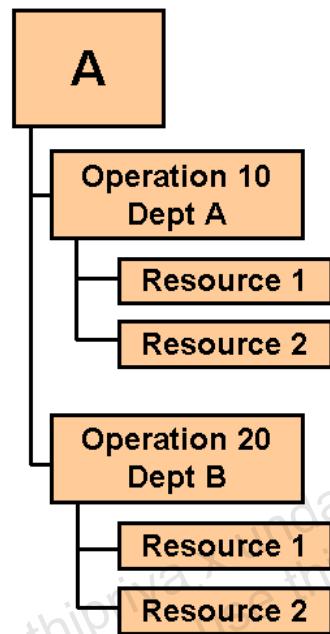
You use a workday calendar to specify that days that your facility works (workdays) and does not (non-workdays) as well as the general shifts that you use. The diagram shows a month in a workday calendar; it represents an organization that works two shifts on Monday through Friday of each week.

You specify workday calendars in Oracle Bills of Material. You assign a calendar to an organization in Oracle Inventory.

When you specify your departments and resources, you select the shifts that each resource works from the ones you have specified in the workday calendar.

## Routings

### Routings



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### Routings

You use routings to specify the process that you use to manufacture assemblies and subassemblies. A routing consists of operation steps. Each operation step occurs at a department and contains resources that perform work.

## Forecasts

## Forecasts



**Forecast**

**WESTERN**  
Regional forecast

**CENTRAL**  
Regional forecast

**EASTERN**  
Regional forecast

Item	Date	Qty	Source
A	6/1	25	Western

Item	Date	Qty	Source
A	6/1	50	Central

Item	Date	Qty	Source
A	6/1	10	Eastern

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### Forecasts

You create forecasts in Oracle Demand Planning to state expected shipments of goods due to customer orders that you expect to receive. Use sales orders to state expected shipments of goods due to customer orders that you have received. Make-to-stock, configure-to-order, and make-to-order businesses often use forecasts in their planning engine.

Forecasts contain the following elements:

- Item numbers
- Dates
- Original quantities
- Current quantities
- Sources: The ship-to region that places the forecast and the ship-from organization that fulfills it. If you use global forecasting, you do not need to specify sources.

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

Current quantities are quantities of 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 received. The process to calculate current quantities from original quantities is forecast consumption.

Global forecasts are forecasts that you create in Oracle Demand Planning with no ship from information and publish to Oracle Advanced Supply Chain Planning. If a forecast from Oracle Demand Planning has ship from information, it is a local forecast.

You can also create forecasts in the source instance using Oracle Master Scheduling/MRP and collect them to the planning instance. Source instance forecasts must be local forecasts--they cannot be global forecasts.

## Quiz

### Quiz

**Anything (except component materials) that you use or need in manufacturing a product are called:**

- 1. Routings**
- 2. Items**
- 3. Resources**
- 4. Forecasts**

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**Answer:** 3. Resources

## Quiz

### Quiz

**These represent your business' facilities or functions:**

- 1. Organizations**
- 2. Bills of Materials**
- 3. Items**
- 4. Departments**

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**Answer:** 1. Organizations

### Topic Overview: Planner Workbench

- **Introduction**
- **Navigation window**
- **Planning analysis windows**
- **Owning organization**
- **Navigation tips**
- **Preferences and folders**

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## Introduction

### Introduction

- **Planner Workbench uses**
- **Windows**

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### Introduction

The main form that planners use is Planner Workbench. Use it to:

- See the recommendations of the planning engine
- See the supporting data used in the planning engine
- Analyze and adjust the results of the planning engine
- Implement the recommendations of the planning engine
- Review plan performance
- View all of the actions that need immediate attention
- From almost any summary information, drill down to the details

Planner Workbench shows in two windows:

- **Navigation:** Organizes plans and their elements. You can select the plans and elements that you want to see detailed information about.
- **Planning analysis:** Displays detailed information for plans and their elements that you have selected in the navigation window. This includes an assortment of windows (the context windows) that display different types of information. From context windows you can often drill down to details based on the entity that you have selected in the navigator

window. For example, view the supply/demand detail for an item, then drill down to information about how you obtain it (sourcing information) and to its on-hand inventory.

## **Navigator Window**

### **Navigator Window**

- **Plan tabbed region**
- **Queries tabbed region**

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## **Navigator Window**

The navigator window has two tabbed regions:

- Plan
- Queries

### **Plan Tabbed Region**

The Plan tabbed region displays the plans for the organization that you have selected and viewable by the following categories:

- Actions
- Items
- Organizations
- Projects
- Resources
- Suppliers

They are in a hierarchical tree format. You can:

- Expand each plan to see its elements

- Specify the sort of the elements under the plan: Actions (exception messages and recommendations), items, organizations, projects, resources, and suppliers
- Multi-select plans and elements

When you select plan and its elements, the corresponding detailed information displays in the planning analysis window. If you select more than one node in the navigator window, the analysis window displays information for both nodes selected. For instance, if you select two items in the navigator window then the Horizontal Plan shows details for both items listed consecutively.

## **Queries Tabbed Region**

Use this pane to create queries that filter the items, suppliers, resources, and exception messages that display in Planner Workbench analysis window. You can save your queries and change them at any time.

When you select queries and the analysis window displays corresponding detailed information, it only shows the entities that the filter selects. For example, if you select a query that filters for only purchased items and display a window of item details, only purchased items show there.

**(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning >  
Planner Workbench >**

## **Overview of Planner Workbench**

## Analysis Window

### Analysis Window

#### Context windows

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### Analysis Window

The analysis window displays the context windows. The context windows display detailed information about the plans and entities that you select in the navigator window.

The titles of some context windows are:

- Horizontal Plan
- Vertical Plan
- Supply/Demand
- Exceptions Summary
- Exceptions Detail
- Items
- Supply Chain Bill
- Routing Operations
- Sources
- Resource Availability
- Where Used

- Supplier Capacity
- Gantt Chart
- Key Indicators

(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning > Planner Workbench > Using the Context Windows

## Owning Organization

### Owning Organization

- In the Organization window, your selection indicates both an instance and an organization within that instance.
- When an ASCP plan involves several supply chain organizations, all of the organizations can be viewed from the owning organization.

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### Owning Organization

The owning organization is the organization that defines the plan parameters and launches the planning process. An owning organization has global visibility over all the results for all organizations in the plan.

Oracle Applications organization security still applies to the owning organization.

## Navigation Tips

### Navigation Tips

- **Find window**
- **Navigator window selection**
- **Queries tabbed region**
- **Drill down**
- **Icons**
- **Menus**
- **Right-click menu options**
- **Properties**
- **Find**
- **Expand partial**

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## Navigation Tips

There are several ways that you can navigate among context windows and find or specify other information in Planner Workbench:

- **Find window:** Control the volume of data displayed
- **Left-pane selection:** Select plans and their entities in the navigator window to see detailed information in the analysis window.
- **Queries tabbed region:** A left -pane tabbed region
- **Drill down:** Double-click on an entity to find more detailed information about it. For example, if you double-click on an exception message name in the Exception Summary window, you see the details of all exceptions of that type.
- **Icons:** Click icons on the navigator window for creating queries and for accessing some context windows.
- **Menus:** Select from the Oracle Applications menu Tools; if enabled in the analysis window, it has choices specific to the window that currently displays.
- **Right-click menu options:** Right-click on an entity and select from the menu that displays; it has choices specific to the window that currently displays.

- **Properties:** A right-click menu choice; use it to see a window with more details about the entity.
- **Find:** A Tools menu choice; use it to search for certain items in the display.
- **Expand partial:** A right-click option in the navigator window; use it to find items, item categories, and product families that start with certain characters.

(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning > Planner Workbench > Tailoring the User Interface

## Preferences and Folders

### Preferences and Folders

- **Preferences**
- **Folders**

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#### Preferences

Use Planner Workbench preferences to:

- Specify the types of demand and supply that you want to see displayed in the horizontal plan, for example, you want to see purchase order supply but not expected scrap demand
- Customize the data that displays and how the data displays, for example, the number of decimal places that you want to see

There is one set of preferences in Planner Workbench for you. You can:

- Save as many preference sets as you want, each with a different name
- Use them every time you use Planner Workbench
- Change them at any time

#### Folders

If you do not have any folders, you see the default Oracle display of columns in the context windows.

Use folders to specify information about the data columns that you want to appear in a display. For example, you:

- Display a column that Oracle does not display as a default
- Suppress displaying a column that Oracle does display as a default
- Move a column to a different position in the display that Oracle places it by default
- Change the title of a column to one different from the one that Oracle gives it

In each Planner Workbench window that uses folders, you can:

- Create as many folders as you want
- Save them for future sessions
- Set one as the default

Each time you access that window, you see the display as you have specified in your default folder. You can change the display by selecting another folder and you can change the specifications for any folder at any time.

## Quiz

### Quiz

**An owning organization has global visibility over all the results for all organizations in the plan.**

- 1. True**
- 2. False**

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**Answer:** 1. True

### Topic Overview: Researching Data for Planning

#### Context windows

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## Context Windows

### Context Windows

- **Items**
- **BOM/Routing**
- **Components**
- **Where Used**

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## Context Windows

### Items

Use Planner Workbench context window Items to see the items that the planning engine planned and their pertinent item attributes.

### BOM/Routing

Use Planner Workbench right-click menu option BOM/Routing to select choices that you can use to view information about bills of material and routings that the planning engine planned.

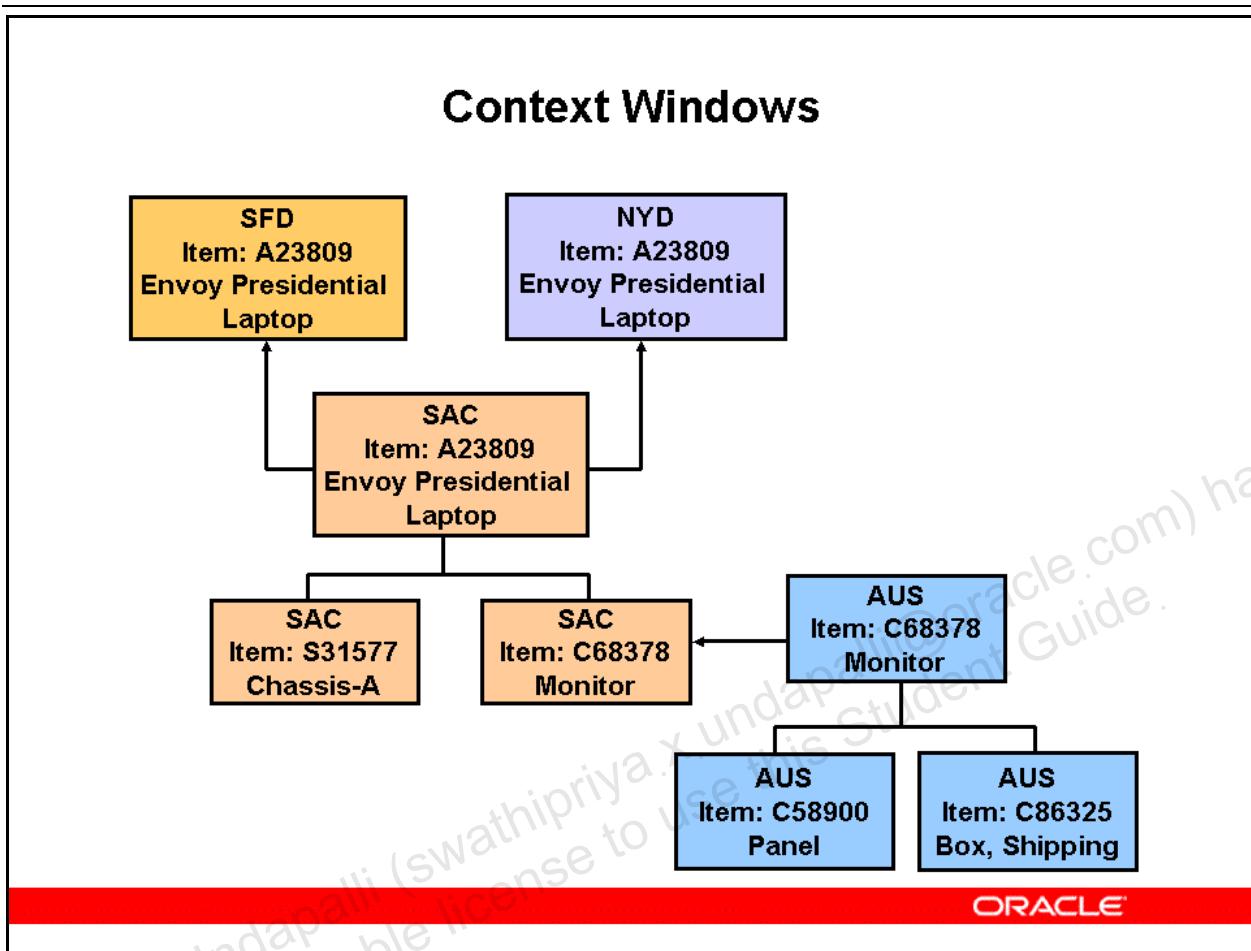
### Components

Use Planner Workbench context window Components to see information about the components of items that the planning engine planned.

### Where Used

Use Planner Workbench context window Where Used to see information about the assemblies which use the components that the planning engine planned.

## Context Windows



### Context Windows (continued)

#### Supply Chain

Use Planner Workbench right-click menu option to select choices that you can use to view information about the supply chain for the items that the planning engine planned.

#### Supply Chain Bill

Use Planner Workbench context window Supply Chain Bill to see the supply chain bill of materials for the item that the planning process planned. The display is an indented bill of material and it shows the components of an assembly throughout the entire supply chain--across all organizations.

The assembly in this diagram moves from a feeder plant to a final assembly plant to two distribution centers.

#### Sources

Use Planner Workbench context window Sources to see information about where your organization sources items that the planning engine planned. The source of an item is where it comes from.

## Destinations

Use Planner Workbench context window Destinations to see information about where your organization sends items that the planning engine planned. The destination of an item is where you send it.

## Context Windows

### Context Windows

- **Resources**
- **Routing operations**
- **Process effectivity**
- **Network routing**
- **Co-product**

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### Context Windows (continued)

#### Resources

Use Planner Workbench context window Resources to see information about the resources that the planning engine planned.

#### Routing Operations

Use Planner Workbench context window Routing Operations to see information about the operations of the items that the planning engine planned.

#### Process Effectivity

Use Planner Workbench context window Process Effectivity to see information about the bills of material and routings for the process manufacturing items that the planning engine planned.

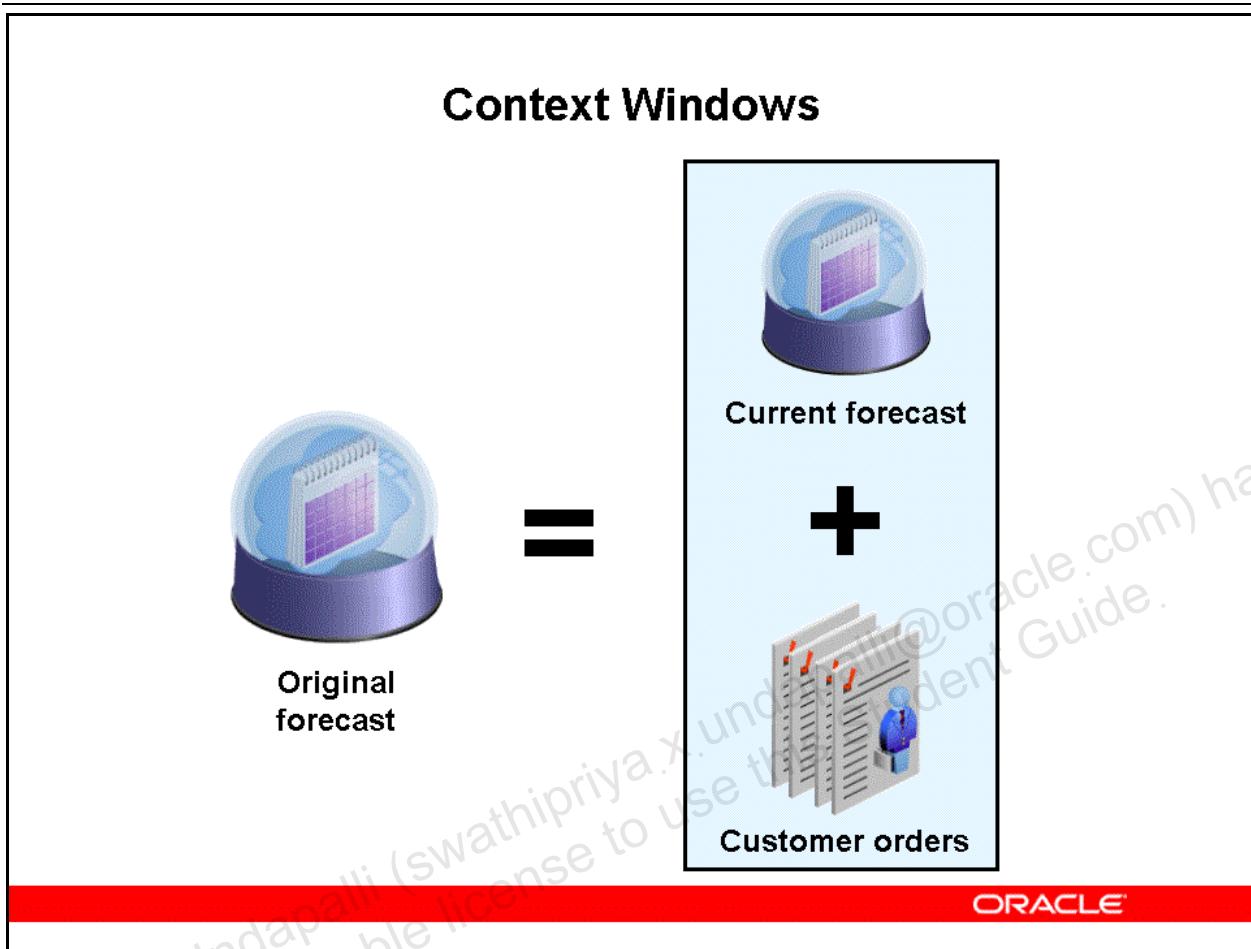
#### Network Routing

Use Planner Workbench context window Network Routing to see network routing information for the items that the planning engine planned.

## Co-product

Use Planner Workbench context window Co-product to see network routing co-product information for the items that the planning engine planned.

## Context Windows



### Context Windows (continued)

#### Consumption Details

Use Planner Workbench context window Consumption Details to see forecast consumption details for forecasts that the planning engine used in planning.

Forecast consumption is reducing a forecast quantity as the sales orders arrive. These sales orders are the ones that the forecast intends to predict.

## **Topic Overview: Planning Results**

### **Topic Overview: Planning Results**

- **Context windows**
- **Making improvements based on KPIs**

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## Context Windows

### Context Windows

ITEM A	1	2	3	4	5
Gross Requirements	80	80	200	200	200
Scheduled Receipts	110	110	110		
Net Requirements			60	200	200
Planned Order Due			60	200	200
Projected Available	20	50	80	50	50
Current Scheduled Receipts				110	
Current Projected On Hand	50	80	-10	-150	-150

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## Context Windows

### Horizontal Plan

Use Planner Workbench context window Horizontal Plan to see a horizontal plan for the items that the planning engine planned. The horizontal plan appears as a table with bucketed information. There is a graph below the table.

Select entities in the navigator window for display of one of the following types of horizontal plans:

- Material
- Capacity
- Supplier
- Transportation

You can see the following information in the Horizontal plan tab:

- **View By Organization:** Sales orders, forecasts, dependent demand, expected scrap, payback demand, other independent demand, gross requirements, WIP+, purchase orders, requisitions, in transit, in receiving, planned orders, payback supply, total supply,

beginning on hand, projected available balance, safety stock, ATP+, current scheduled receipts, projected on hand, expired lots

- **View By Suppliers:** Purchase orders, purchase requisitions, planned orders, required capacity, available capacity, net available capacity, cumulative available capacity, capacity utilization, cumulative capacity utilization
- **View By Resources:** Hours available, required hours, net hours available, cum hours available, capacity load ratio, cum capacity load ratio, hours required per day, hours available per day, total resource cost, sum of capacity changes, cum sum of changes, planned orders, non-standard job orders, discrete jobs, repetitive schedules, flow schedule

Once you view the horizontal plan, you can:

- Change the rows in the display by using Planner Workbench preference sets
- Display the horizontal plan aggregated for all organizations
- Drill down to periods, weeks, and days
- Export the horizontal plan to Microsoft Excel
- Graph horizontal plan information; you select the information and the type of graph.
- View the past-due information in the Horizontal Plan tab. The past-due bucket is the first bucket in the horizontal plan.
- Display different time buckets. For example, you can display the first two weeks in daily buckets, the next six weeks in weekly buckets, and the next ten months in period buckets. This depends on the plan option that you used to specify the plan time aggregation; for example, you cannot display weeks if the plan time aggregation is periods.

### Defining Graphs

1. In the analysis window, choose the Horizontal Plan tab. The plan data appears in a horizontal plan.
2. Select the plan parameters you wish to graph. To graph two or more parameters together, hold the shift key as you select additional parameters. For example, you can graph planned orders, gross requirements, or both. You can also choose to graph multiple items.
3. Right-click to show and hide graph or save preference in the Tools > Preferences menu.
4. Right-click on the Items or Organization area to display more options. Left click on Hide/Show Graph to hide the graph.
5. To change the number of periods being displayed in the horizontal graph, right-click anywhere in the graph and select Viewable Groups. Your choices are 5, 7, or 10. Five is the default.

## Context Windows

### Context Windows

- **Vertical plan**
- **Supply/demand**
  - **Pegging**

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### Context Windows (continued)

#### Vertical Plan

Use the Planner Workbench context window Vertical Plan to see a vertical plan for the items that the planning engine planned. The vertical plan appears as a list with non-bucketed information; it shows each planned transaction in and out of inventory. There is a graph below the list.

#### Supply/Demand

Use Planner Workbench context window Supply/Demand to see detailed information about the supply and demand relative the the plan. The demand and supply appear as a list with non-bucketed information. There is pegging information below.

Select entries in the navigator window for display as one of the following types of information:

- Supply
- Demand
- Supply/Demand
- On-hand

## Pegging

- The planning engine, when it pegs, proceeds down the supply chain bill and associates demands with supplies. As part of system setup, your organization can instruct the planning engine to perform any of the following types of pegging (pegging modes):
- **Standard:** Groups demands and supplies into windows and pegs within the window.
- **Priority:** Pegs by high priority demands first.
- **FIFO:** Pegs day-by-day.
- **Priority/FIFO:** Pegs day-by-day with high priority demands first.
- Select an entry in the navigator window for display in the pegging tree.

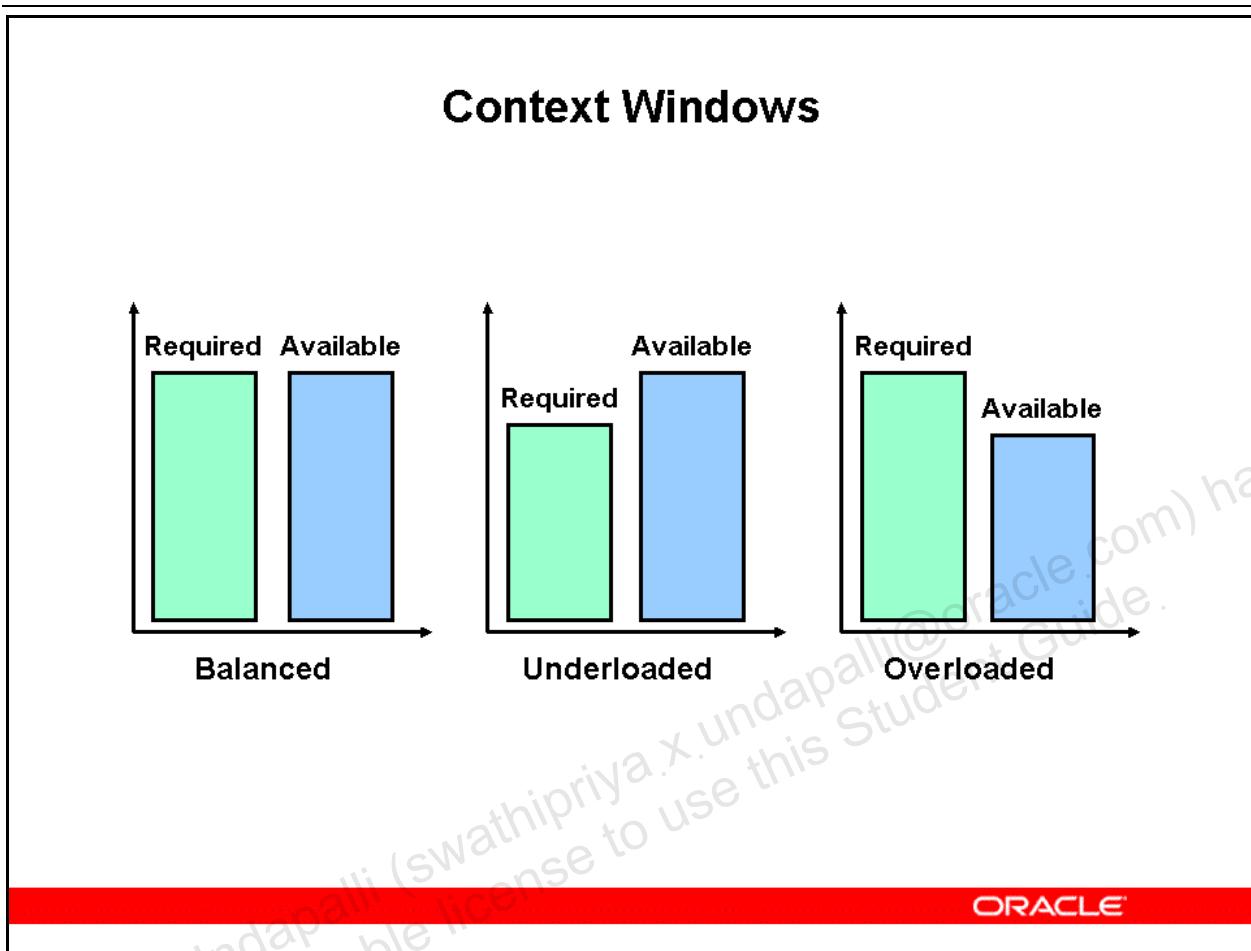
While in the pegging tree, you can:

- View from demand to supply or from supply to demand
- **Expand and contract nodes:** To expand the Pegging tree, highlight the pegging node, then press right-click > Expand All
- **See details of each node:** Press right-click > Properties
- Go backwards and forwards through the history of your pegging navigation
- Hide or show dependent demands
- Hide or show resources
- Jump to other detail windows using the right-click menu.

The default display is: if you peg from demand to supply, supply order details and end item demand order information; if you peg from supply to demand, supply order details, immediate parent demand information, and end item demand information.

If you are running a constrained plan, Oracle ASCP will compute pegging for all items irrespective of their pegging item attributes.

## Context Windows



### Context Windows (continued)

#### Resource Availability Summary

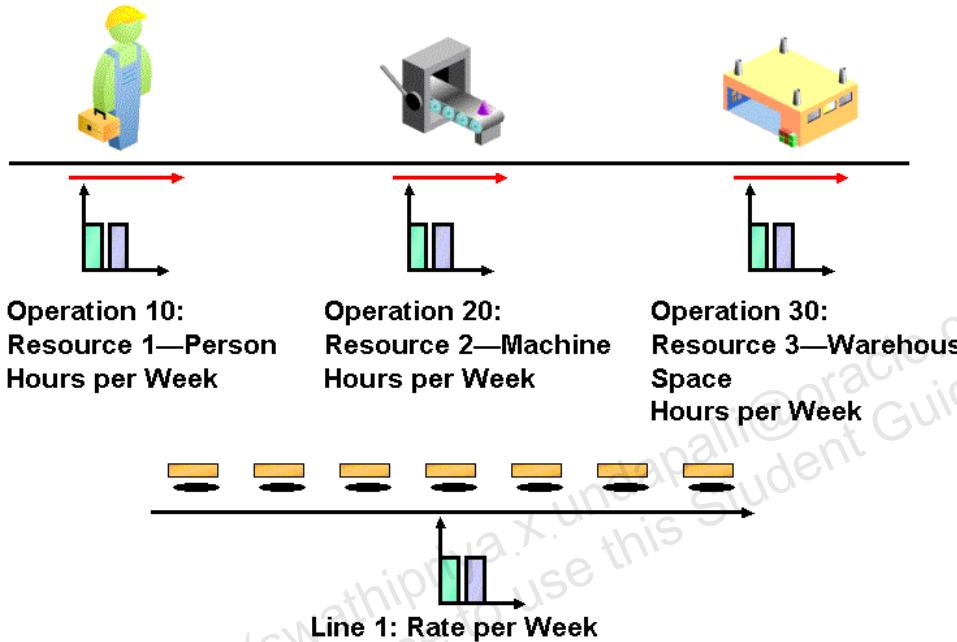
Use Planner Workbench context window Resource Availability Summary to see resource available hours.

#### Resource Availability

Use Planner Workbench context window Resource Availability Summary to see resource available shifts and to change resource availability.

## Resource Requirements

### Resource Requirements



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## Context Windows (continued)

### Resource Requirements

Use Planner Workbench context window Resource Requirements to see details of required time against resources.

## Context Windows

### Context Windows

- **Safety stock**
- **Substitution chain**
- **Supplier capacity**
- **Supplier variability**

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### Context Windows (continued)

#### **Safety Stock**

Use Planner Workbench context window Safety Stock to see time-phased safety stock levels and to change safety stock levels for non-MRP planned safety stock items.

#### **Substitution Chain**

Use Planner Workbench context window Substitution Chain to see the substitution chain for items, customers, and customer sites.

#### **Supplier Capacity**

Use Planner Workbench context window Supplier Capacity to see and set supplier capacity and to set supplier capacity allowable percent increases (supplier flexfences).

#### **Supplier Variability**

The Supplier Variability context window does not apply to Oracle Advanced Supply Chain Planning.

## **Topic Overview: Planner Strategies**

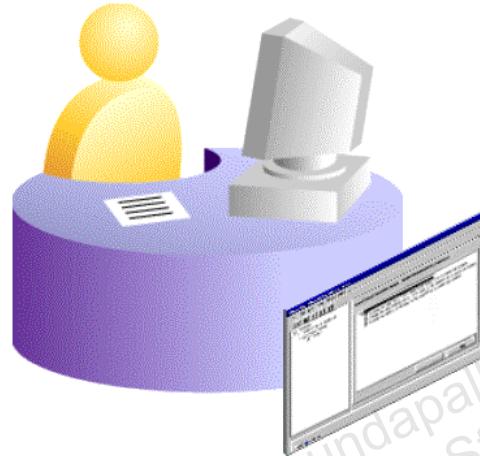
### **Topic Overview: Planner Strategies**

#### **Planner strategies**

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## Planner Strategies

### Planner Strategies



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#### Planner Strategies

Planners need a strategy on which types of exceptions they focus on at the beginning of the day:

- Shortages
- Late Orders
- Inventory Levels
- Late Suppliers
- Line Down
- Releasing Orders
- Supplier Capacity
- Shop Capacity
- Obsolete Inventory
- Cancellations
- Changing Customer Demand
- Key Customer issues

- Upper Management Commitment

#### Activities - Exception Messages

- Verify exceptions are reasonable
- Filter by planner
- Review by category
- Past Due Sales Orders
- Past Due Forecasts
- Review pegging of late supply
- Constraints
  - Material
  - Resource
- Excesses and shortages
- Alternates and substitutes

Planners first tasks of the day are:

- Select Plan
  - Did Collection Run o.k.?
    - Error Alert
    - Review Concurrent Request
    - Review Collection Plan
    - New Requirements in Plan
  - Did the plan run o.k.?
    - Error Alert
    - Review Concurrent Request
    - Ability to select plan in Planners Workbench
- Verify Key Performance Indicators (KPI's) are what you expect:
  - Inventory Turns
    - Item Costs are needed
  - Omtine Delivery
  - Margin Percent
  - Planned Utilization
- Look for significant differences
- Can compare multiple plans

## Summary

### Summary

**In this module, you should have learned how to:**

- **Describe data for planning**
- **Describe planner workbench**
- **Describe how to research data for planning**
- **Describe planning results**
- **Describe planner strategies**

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## **Unconstrained Plans**

**Chapter 3**

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## Unconstrained Plans

# 3

## Unconstrained Plans

### Advanced Supply Chain Planning Fundamentals

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## Objectives

### Objectives

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

- **Describe planning concepts**
- **Describe creating plans**
- **Create unconstrained plans**
- **Launch unconstrained plans**

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## Module Overview: Topics

### Module Overview: Topics

- **Planning concepts**
- **Creating plans**

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### Planning Concepts Overview I

- **Data quality**
- **Plan types**
- **Requirements explosion**
- **Requirements explosion items**
- **Requirements explosion quantities**
- **Backward scheduling**
- **Order dates**
- **Use-up effectivity**
- **Phantoms**
- **Shrinkage and yield**

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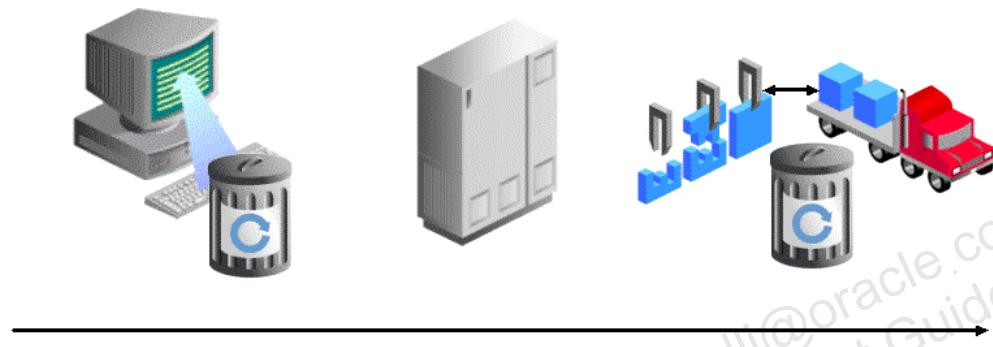
### Planning Concepts Overview II

- **Resource requirements**
- **Required hours**
- **Efficiency and utilization**
- **Engineering change orders**
- **Reservations**

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## Data Quality

### Data Quality



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#### Data Quality

Data accuracy is critical to the success of your planning process. The closer that your transaction data is to reality (accuracy), the more usable the recommendations of the planning process are to your facilities.

Industry literature suggests accuracy level benchmarks for different entities, for example, inventory accuracy. Most of the levels are in the 95% to 98% range.

The farther away from these benchmarks your transaction data is, the less valid the planning engine suggestions will be. For example, if you use two of a component in an assembly but your bill of material records one per, the planning engine will consistently suggest that you order only half of what you need.

Common critical errors are:

- **Items**
  - Wrong on-hand quantity
  - Purchased items set up as manufactured items, and vice versa
  - All of lead times set to the same default value, such as one week
- **Bills of material**
  - Wrong components

- Wrong usage quantity
- Obsolete revision
- **Routings**
  - Wrong resources or quantity of resources assigned to the department
  - Wrong work hours, maintenance time ignored
  - Inaccurate setup and run time estimates
  - Material usage linked to the wrong operation
  - Yield losses ignored
- **Suppliers**
  - Are approved supplier lists maintained?
  - Is infinite supplier capacity assumed?
  - Is the same default lead time used regardless of item or supplier?

## **Importance of Data Accuracy Increases with Planning Advancements**

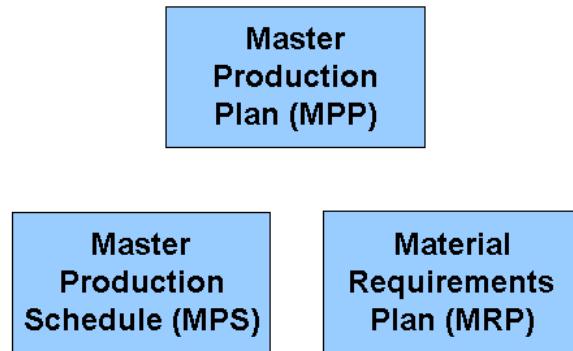
As planning techniques advance, even higher data quality is required.

- Traditional planning costs exceed benefits until input data accuracy reaches very high levels.
- The benefits of constraint-based planning are even more vulnerable to inaccurate data. Material and resource constraints wrongly defined result in infeasible plans. Unlike ERP, constraint-based planning does not use experience, judgment, and manual iterative processes to maintain feasibility. Therefore when the input data is inaccurate, the resulting CBP plan might be less useful than a plan generated by traditional ERP processes.
- While traditional and constraint-based plans can be calculated with no price or cost data input, ASCP optimization is critically vulnerable to inaccurate price and cost data. Penalty cost factors are applied as multipliers of basic price or cost data. When the prices and costs are wrong, the penalty costs are very wrong. The optimization algorithm would then calculate the best answer to the wrong problem.

**Note:** ASCP optimization algorithms are similar to linear programming cost minimization problems in that penalty costs, plan objectives, and optimal solutions are all evaluated on the basis of monetary value. ASCP optimization currently requires that all of the organizations within one plan use the same currency.

## Plan Types

### Plan Types



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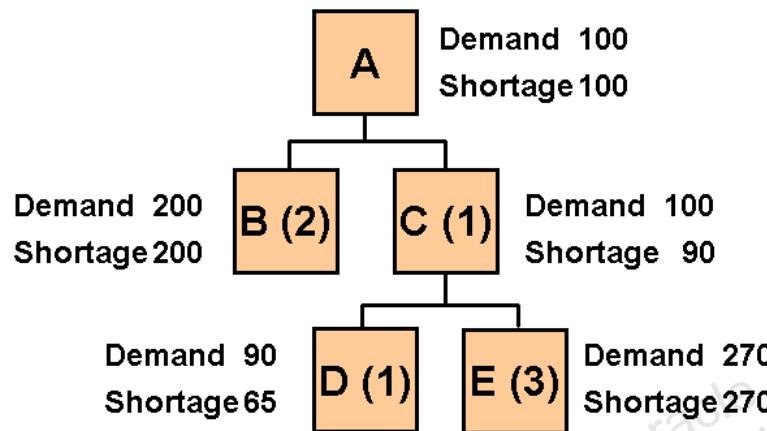
### Plan Types

There are several plan types. The plan types perform the same requirements explosion so you can virtually use any plan in your planning in any planning scheme.

For global supply chain planning (using one plan to plan your entire organization), Oracle suggests a material requirements plan.

## Requirements Explosion

### Requirements Explosion



<u>Item</u>	<u>MDS</u>	<u>Stock On Hand</u>	<u>Stock On Order</u>
A	100		
C		10	
D			25

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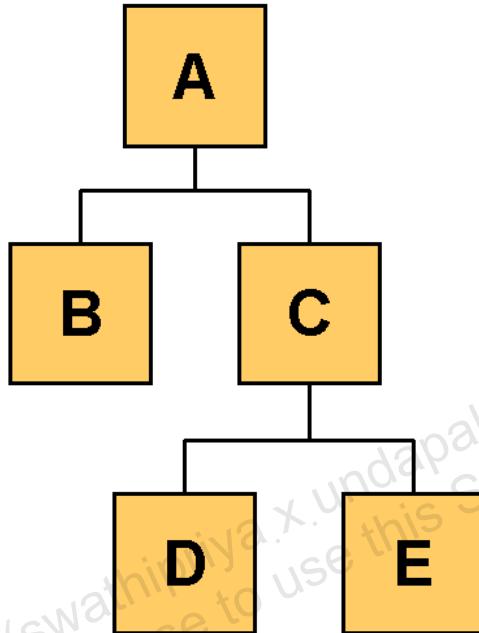
### Requirements Explosion

The requirements explosion is the process that the planning process uses to balance supply and demand. It proceeds down the supply chain bill of material to assure that there is enough supply--on hand and on order--to meet demand. Where there is not, it makes recommendations to add, change, or cancel supply.

The shortage of one item creates a demand for the items one level below it in the supply chain bill of material.

## Requirements Explosion Items

### Requirements Explosion Items



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#### Requirements Explosion: Items

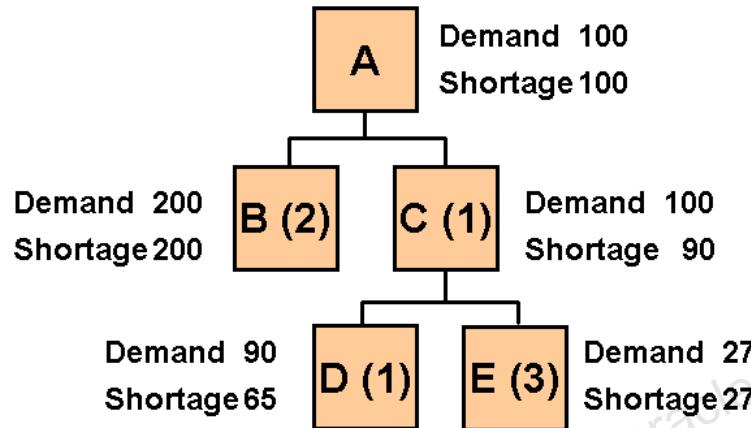
The planning process plans all items in the supply chain bill of material that are:

- Indicated to be planned
- Indicated as planable by the plan type

The planning engine does not look for components of buy from items. For example, if you mis-mark a make item as a buy item, the planning engine does not suggest replenishing any of its components.

## Requirements Explosion Quantities

### Requirements Explosion Quantities



<u>Item</u>	<u>MDS</u>	<u>Stock On Hand</u>	<u>Stock On Order</u>
A	100		
C		10	
D			25

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### Requirements Explosion Quantities

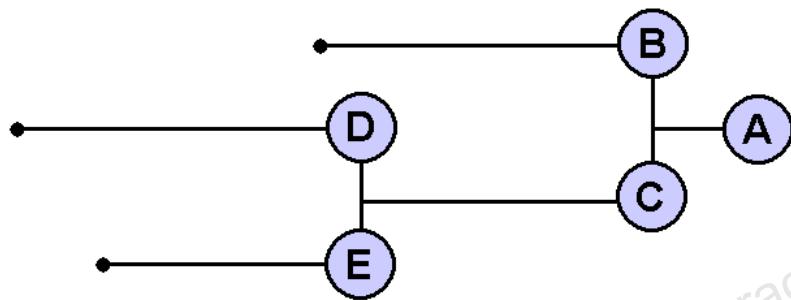
The demand quantity on an item is the shortage of its parent item multiplied by the usage of the child in the parent.

For example:

- The shortage on item A is 100
- It takes two item B's to make one item A.
- The demand on item B is 200 ( $100 * 2$ )

## Backward Scheduling

### Backward Scheduling



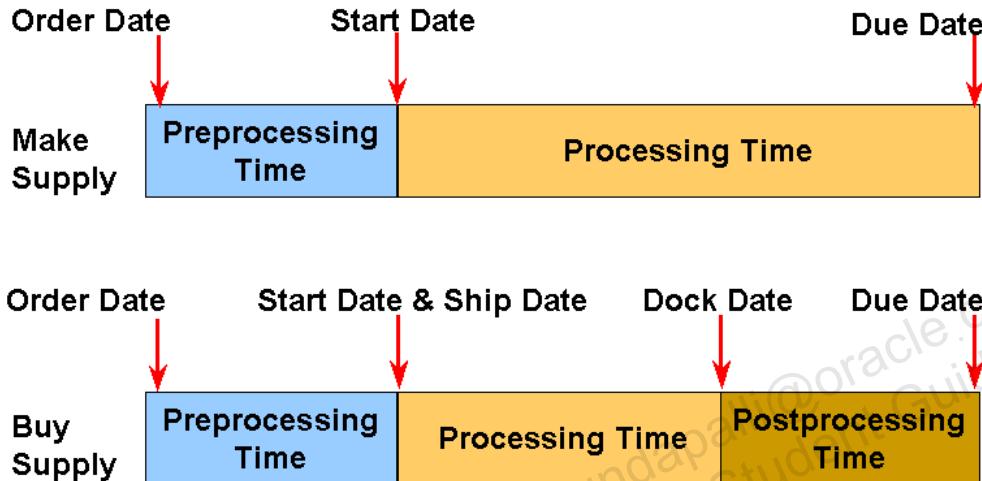
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### Backward Scheduling

Unconstrained plans use backward scheduling. Components on the next lower level of the bill of material are due in inventory as they are needed by the assembly.

## Order Dates: Make Supply and Buy Supply

### Order Dates: Make Supply and Buy Supply



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### Order Dates

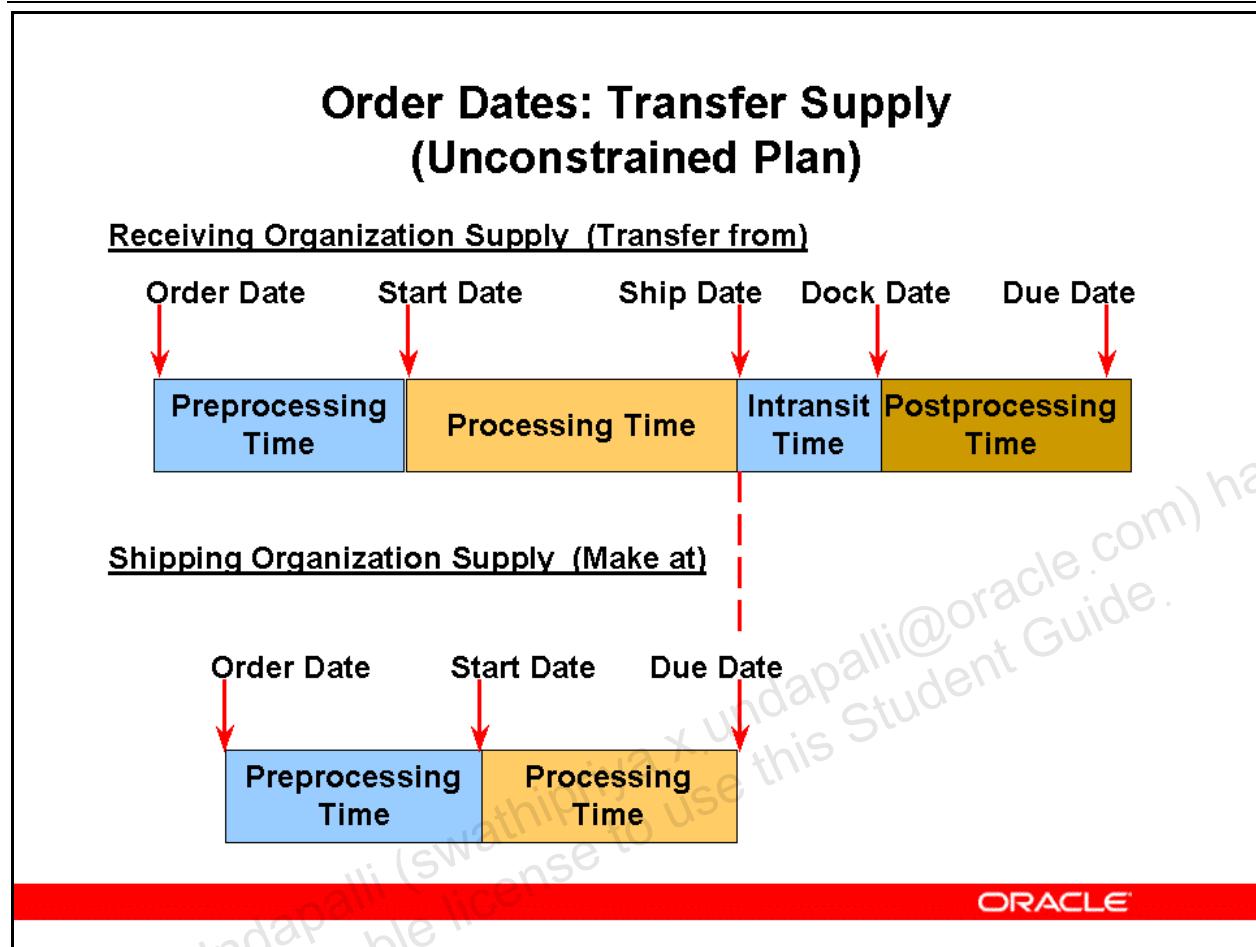
Scheduled receipts have certain dates associated with them. The planning process derives these order dates by scheduling based on:

- Lead times
- Constraints (material, labor, supplier, transportation).

A scheduled receipt may not actually reflect the constraints in an:

- Unconstrained plan because the planning engine assumes infinite capacity and meets demand due dates.
- Optimized plan because, if needed, the planning engine selects the best cost-based option from among the constraints

## Order Dates: Transfer Supply (Unconstrained Plan)



## Order Dates: Transfer Supply

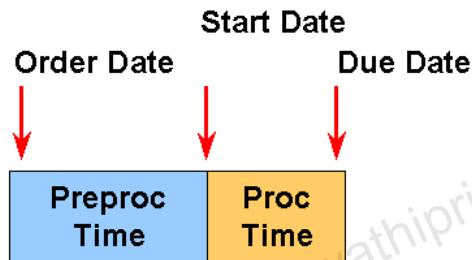
## Order Dates: Transfer Supply (Constrained Plan)

### Order Dates: Transfer Supply (Constrained Plan)

#### Receiving Organization Supply (Transfer from)



#### Shipping Organization Supply (Make at)



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### Order Dates: Transfer Supply (Constrained Plan)

Transportation Duration is added time due to the maximum transfer capacity constraint which is defined as a maximum daily transportation capacity.

## Use-up Effectivity

### Use-up Effectivity

ITEM A	1	2	3	4	5
Include scheduled receipts					
Gross Requirements	100	100	100	100	100
Scheduled Receipts		100			
Projected Available	400	300	100	0	

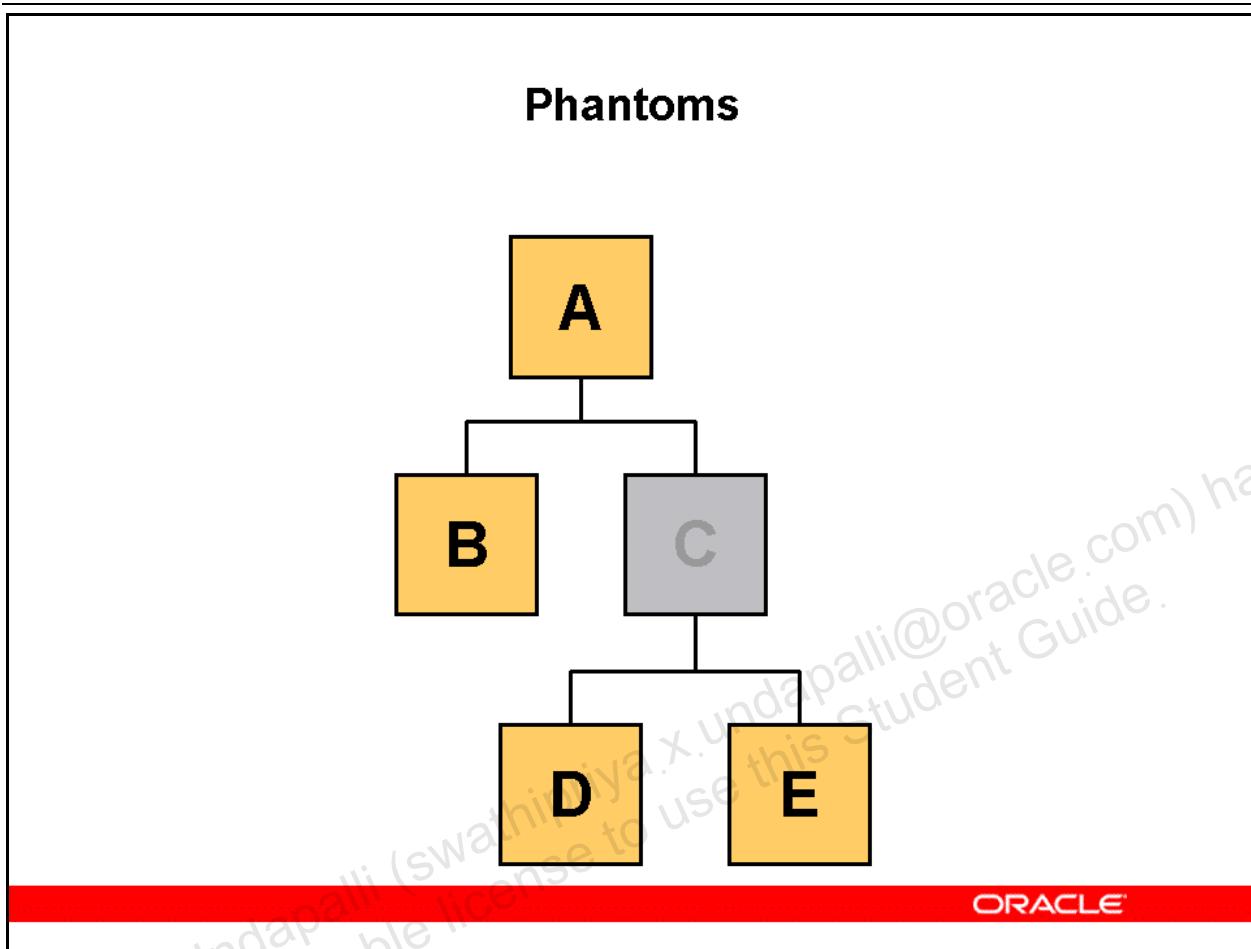
ITEM A	1	2	3	4	5
Ignore scheduled receipts					
Gross Requirements	100	100	100	100	100
Scheduled Receipts		100			
Projected Available	400	300	200	100	0

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### Use-Up Effectivity

The planning process calculates when an item will be used up either by including or excluding scheduled receipts. You can use this date to plan for bill of material changes.

## Phantoms



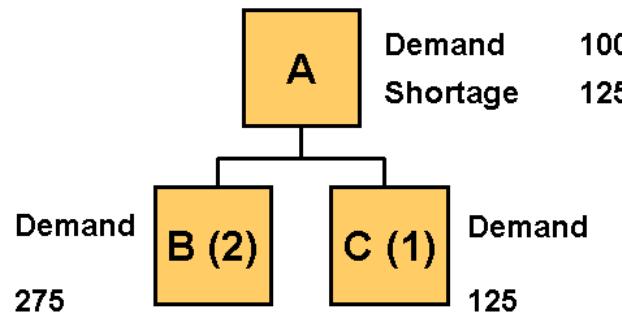
### Phantoms

The planning process recognizes and plans for phantoms. Usually, it ignores the phantom and passes dependent demand to the phantom's components.

Since Oracle Applications does allow phantoms in stock, the planning process does net on-hand phantoms before planning the phantom's components.

## Shrinkage and Yield

### Shrinkage and Yield



**Shrinkage Rate Assembly A = 20%**

**Shortage Assembly A =  $100 \times (1 - 0.2) = 125$**

**Yield Factor Component B = 90%**

**Yield Factor Component C = 100%**

**Usage of Component B in Assembly A =  $2 / 0.9 = 2.2$**

**Demand for Component B =  $125 \times 2.2 = 275$**

**From Base Shortage on Assembly A =  $100 \times 2.2 = 220$**

**From Shrinkage Rate Shortage on Assembly A =  $25 \times 2.2 = 55$**

**Demand for Component C =  $125 \times 1 = 125$**

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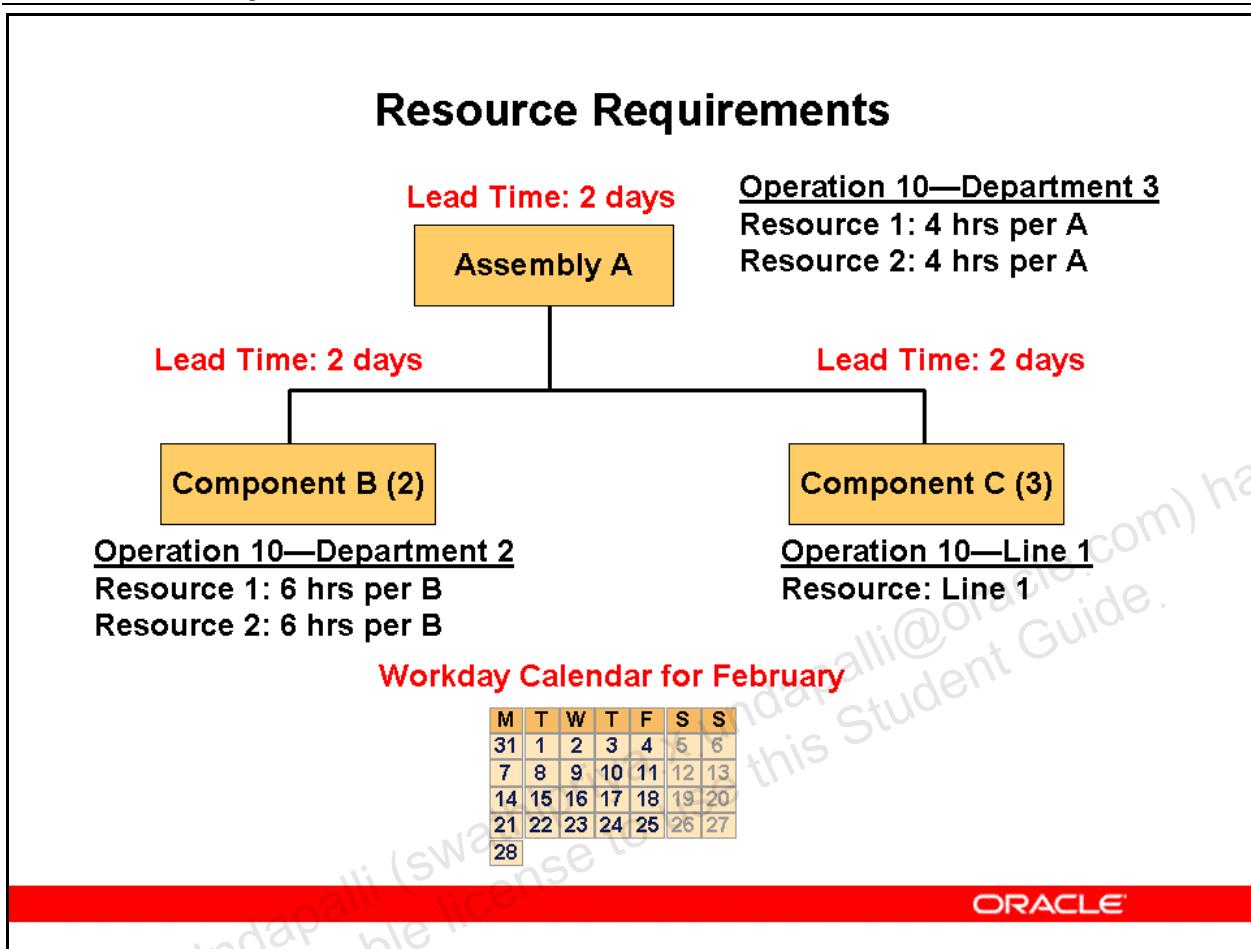
### Shrinkage and Yield

Use shrinkage and yield to instruct the planning process to overplan supply because you expect to receive or to produce some unusable material.

Shrinkage applies to assemblies and purchased items. It increases planned order quantities and reduces expected receipts from scheduled receipts. It is an item attribute.

Yield applies to components and increases their gross requirement quantities. It is a bill of material component attribute.

## Resource Requirements



## Resource Requirements

The planning engine calculates resource requirements during the requirements explosion. It uses the information from the:

- **Routing operations:** Hours per assembly
- Order quantity

It also schedules the resource during the scheduling process using information from the:

- **Resource:** Shift time s
- **Workday calendar:** Workdays and non-workdays

## Required Hours

### Required Hours

**Resource Requirements for D2, R1 based on Plan Entries for Component B**

Plan Date	Plan Quantity	Required Date	Required Hours
03-FEB	20	01-FEB	120
08-FEB	20	04-FEB	120
11-FEB	20	09-FEB	120

**Bucketed Resource Requirements for D2, R1**

Week Start Date	Required Hours
31-JAN	240
07-FEB	120

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### Required Hours

The planning engine calculates resource requirements (required hours) as Hours per assembly

\* Planned order quantity.

To make one component B, you use six hours of Resource D2, R1. A planned order for item B for quantity 20 on 3 February uses 120 hours of resource D2, R1 (6 hours per assembly \* 20 assemblies).

## Efficiency and Utilization

### Efficiency and Utilization



**Efficiency**



**Utilization**

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#### Efficiency and Utilization

Use efficiency and utilization to instruct the planning process to adjust resource requirements and availability as follows:

- Efficiency is how well a resource performs to standard. As the efficiency decreases from 100%, the planning process increases resource requirements needed to perform a task. It is a resource attribute.

It is a measure (expressed as a percent) of the actual output to the standard output expected. Resource efficiency determines the time a resource takes to complete a task. For example, if you expect a resource having an efficiency of 100% to complete a task in 12 hours, the resource having an efficiency of 50% would take 24 hours to complete the task. Effective usage of a resource is the ratio of resource hours as specified in routing (theoretical usage) to efficiency.

- Utilization is how much of the work time the resource spends on direct labor. It reduces resource availability for a shift and is a resource attribute

It is a measure (expressed as a percent) of how intensively a resource is utilized. For example, a resource might take frequent breaks or you might assign maintenance tasks to the resource. As such, a percent of the resource time is not available for the task. The actual usage is the ratio of the resource hours as specified in routing to the product of efficiency and utilization.

- Actual Usage = (Theoretical Usage) / (Efficiency\* Utilization). For example, if a routing has a resource requirement for 2 hours. The efficiency and utilization of the resource is expected to be 90% and 75%, respectively. Therefore, the actual resource usage is calculated as 2.96 hours.

## Engineering Change Orders

Engineering Change Orders					
ASSEMBLY A	28	29	30	1	2
Gross Requirements		100	100	100	100
Planned Order Start	100	100	100	100	
<u>Bill of Material Change</u>					
Item C replaced by Item D	A	B	C	D	A
Effective Day = June 30					
COMPONENT C	28	29	30	1	2
Gross Requirements	100	100			
COMPONENT D	28	29	30	1	2
Gross Requirements			100	100	

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## Engineering Change Orders

The planning process recognizes and plans for engineering change orders to the bill of material. It plans for the correct component on the correct day.

## Reservations

### Reservations

PERIODS	1	2	3	4	5
Gross Requirements	100	100	100	100R	100
Scheduled Receipts					
Net Requirements	100	100	100	100	100
Planned Order Due		100	100		100
On hand	200				
Projected Available	100	100	100	0	0

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### Reservations

The planning process respects reservations of on-hand supply against sales order lines. For example, you have material in stock for the reservation in period 4. The planning process does not suggest using it for requirements in periods 2 and 3; it suggests planned orders.

You create reservations in Oracle Inventory and Oracle Order Management.

## Quiz

### Quiz

**Which plan type is most useful for global supply chain planning?**

- 1. Master Production Plan (MPP)**
- 2. Material Requirements Plan (MRP)**
- 3. Master Production Schedule (MPS)**
- 4. All of the above**

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**Answer:** 2. Material Requirements Plan (MRP)

## Quiz

### Quiz

**The demand quantity on an item is the shortage of its parent item multiplied by the usage of the child in the parent.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Quiz

### Quiz

**Shrinkage applies to components and increases their gross requirement quantities.**

- 1. True**
- 2. False**

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**Answer:** 2. False: Yield applies to components and increases their gross requirement quantities.

## Quiz

### Quiz

**Efficiency is a percentage of the actual output to the standard output expected.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Creating Plans Overview

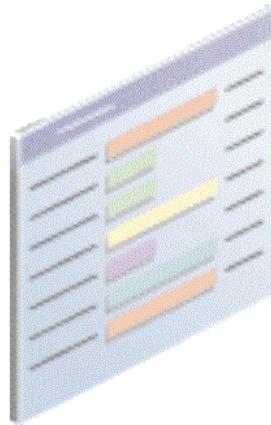
### Creating Plans Overview

- **Plan names**
- **Unconstrained plan options**
- **Main tabbed region**
- **Material scheduling method**
- **Overwrite and append options**
- **Planned order sourcing**
- **Aggregation tabbed region**
- **Aggregation into time periods**
- **Aggregation of items, resources, and routings**
- **Organization tabbed region**
- **Constraints tabbed region**
- **Launching plans**

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## Plan Names

### Plan Names



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#### Plan Names

You can have multiple plans in Oracle Advanced Supply Chain Planning. Even if you plan your entire supply chain using one plan (global supply chain planning), you may have simulation plans to help you analyze and resolve exception messages.

You identify each plan by a name.

You can use the Names window to create as many plan names as you need. After you generate a plan, the plan becomes available to the Planner Workbench. Use the Planner Workbench to view key performance indicators and to respond to action messages. In the Organization Selection field, if you select All, the planning process plans all organizations in your database installation. If you select Multiple Organizations, the organizations that you list in the Plan Option Organizations tab are planned.

Designate one production version with the Production checkbox. When the Production checkbox is selected, automatic order release can occur, depending on the item attribute Release Time Fence, located on the MPS/MRP tab of the Organization Item window.

The organization that you are in when you create plan names becomes the owning organization for those plan names.

The Inventory ATP checkbox designates which plan is the basis of ATP calculations.

**Notes:**

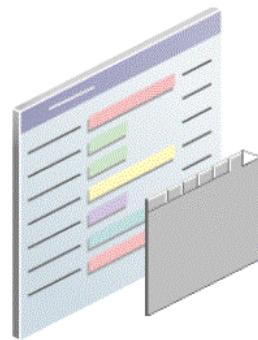
- Workflow messaging is enabled only for the plan designated as the production version.
- It is important that no more than one plan is selected for ATP.
- With release 11.5.5, the selection of Manufacturing Plan, Distribution Plan or Production Plan as a planning method appears on the Plan Options form. As before, this setting interacts with the Planning Method item attribute to determine which items are planned by a given supply chain Plan Type.

(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning > Defining Plans >

Overview of Defining Plans > Creating Supply Chain Plans

## Unconstrained Plan Options

### Unconstrained Plan Options



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#### Unconstrained Plan Options

You use plan options to instruct the planning process how to perform in many different ways. Plan options that apply regardless of plan type or class are called common plan options.

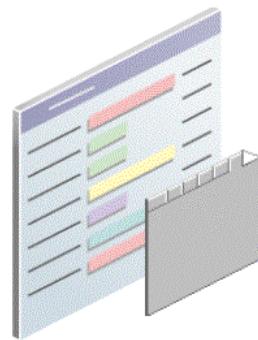
The Plan Options form has tabbed regions, you use these tabbed regions in unconstrained planning:

- Main
- Aggregation
- Organization
- Constraints

(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning > Defining Plans >  
Setting Plan Options > ...  
... > The Main Tabbed Region  
... > The Aggregation Tabbed Region  
... > The Organization Tabbed Region  
... > The Constraints Tabbed Region

## Main Tabbed Region

### Main Tabbed Region



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#### Main Tabbed Region

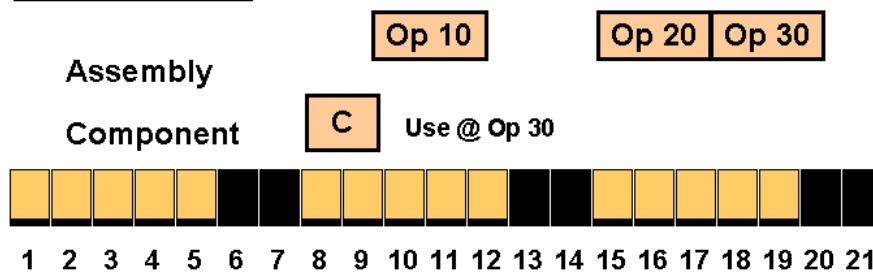
When setting unconstrained plan options in the Main tabbed region, make note of the following:

- **Planned Items:** Controls the items that the planning engine plans.
- **Material Scheduling Method:** Controls scheduling of component material due dates.
- **Assignment Set:** Specifies the planned order sourcing.
- **Demand Priority Rule:** The types of demands that receive higher or lower priority for pegging to supplies.
- **Overwrite and Append Planned Orders:** Specifies restrictions on deleting and placing planned orders within the planning horizon.
- **Schedule By:** The sales order date that the planning engine should use to satisfy demand.
- **Enable Pegging:** The planning engine pegs demand to supply.

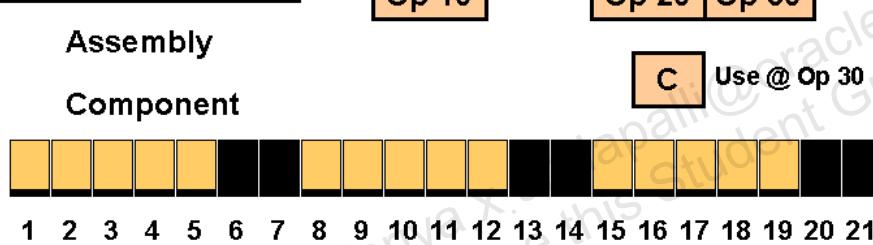
## Material Scheduling Method

### Material Scheduling Method

#### Order Start Date



#### Operation Start Date



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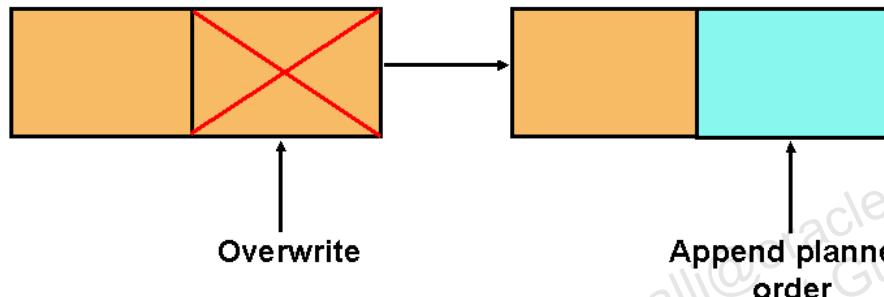
### Material Scheduling Method

Specify plan option Material Scheduling Method to instruct the planning process when to plan to make component material available for make at items. You can decide to have either of the following:

- Component material due at the start of the order
- Components due at the start of the operation that uses them

## Overwrite and Append Options

### Overwrite and Append Options



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### Overwrite and Append Options

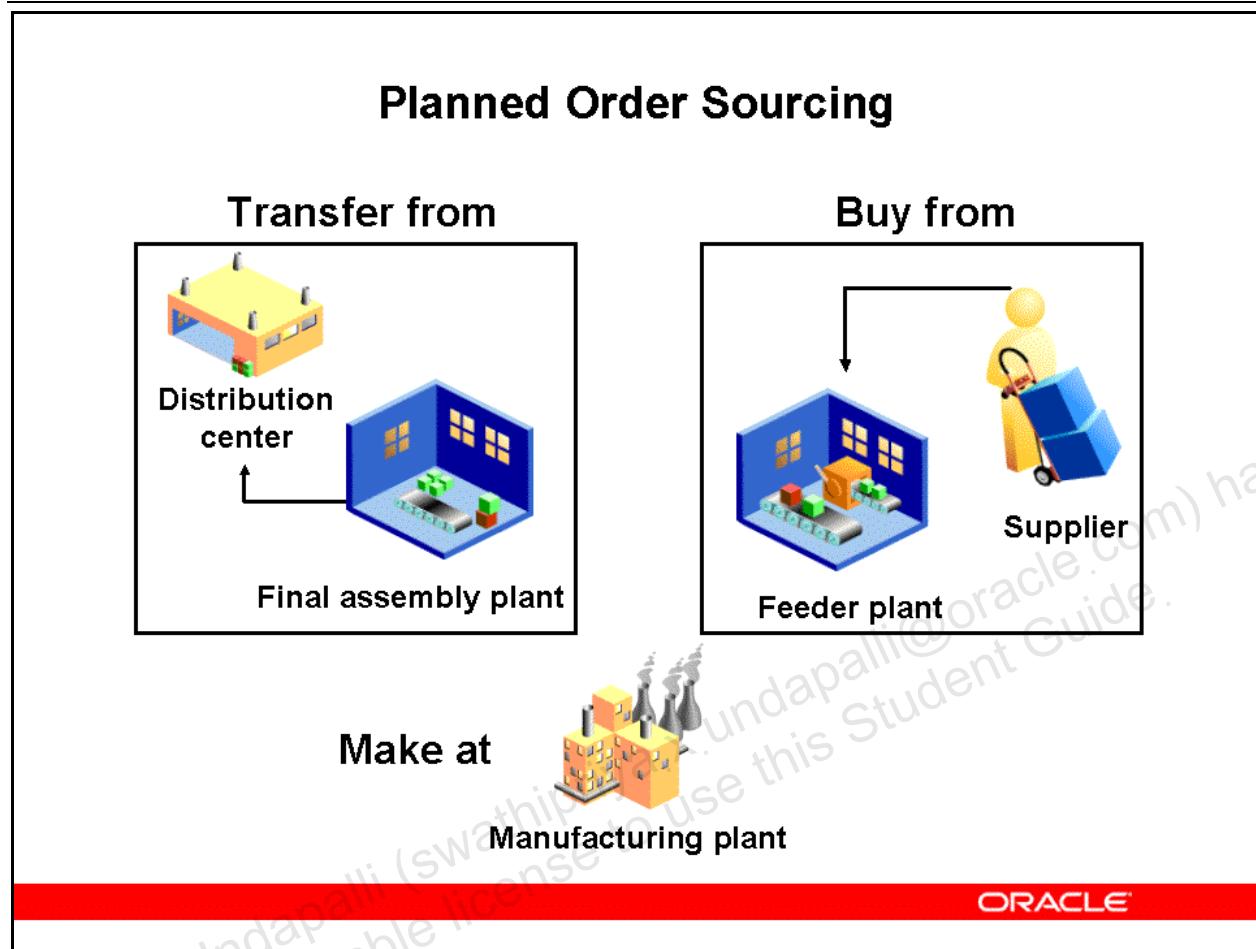
You specify overwrite and append options to instruct the planning process in:

- **Overwriting:** Which planned orders from previous planning runs to delete
- **Appending planned orders:** Where it may place planned orders from the current planning run

The possible choices for these options include the planning time fence. The planning time fence marks the later boundary of the stable schedule; the earlier boundary is the planning start date. You typically do not want planned orders to appear in this section of time.

(Help) Supply Chain Planning > Oracle Advanced Supply Chain Planning > Defining Plans >  
Setting Plan Options > Overwrite Options

## Planned Order Sourcing

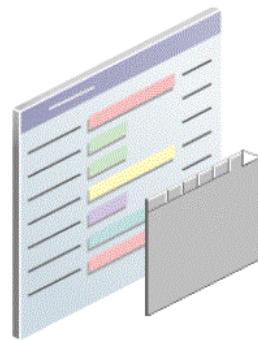


### Planned Order Sourcing

You specify sources for your items. This instructs the planning process where to suggest that you get them.

## Aggregation Tabbed Region

### Aggregation Tabbed Region



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#### Aggregation Tabbed Region

When setting unconstrained plan options in the Aggregation tabbed region, time granularity options specify the bucket size for the planning and scheduling horizons. The planning horizon can be divided into three ranges: short, medium, and long. The bucket size for those ranges can be stated in daily, weekly, or period buckets. When the time granularity is set to weeks or periods, messages generated for those buckets appear on the last day of the week or period.

The scheduling horizon has the same duration as the short range of the planning horizon. The scheduling horizon can be further divided into three sections, with bucket sizes stated in terms of minutes, hours, or days.

You can represent the planning horizon using any combination of daily, weekly, or period time buckets. For the portion of the plan that is aggregated into weeks or periods, events are planned to occur on the last day of each week or period.

## Aggregation into Time Periods

### Aggregation into Time Periods

#### Bucket size

- Days
- Weeks
- Periods

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#### Aggregation

Use the Advanced Supply Chain Planner responsibility to navigate to the Aggregation tab of the Plan Options window.

(N) Supply Chain Plan > Options (T) Aggregation

You can represent the planning horizon using any combination of daily, weekly, or period time buckets. For the portion of the plan that is aggregated into weeks or periods, events are planned to occur on the last day of each week or period.

## Aggregation of Items, Resources, and Routings

### Aggregation of Items, Resources, and Routings

#### Items

- Item
- Product family

#### Resources

- Individual
- Aggregate

#### Routings

- Individual
- Bill of resources

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## Aggregation of Items, Resources, and Routings

The last group of common plan options determines the level of aggregation:

- Plan for individual items or in terms of product families
- Plan using routings or bills of resources
- Plan for individual resources or by aggregate resource

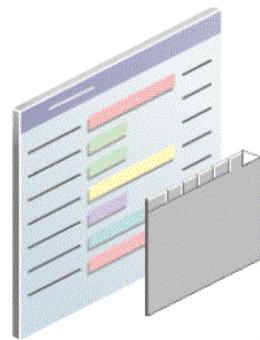
If you have grouped your items into product families, you can use the Items row to define the planning horizons for which you want your material plan to be stated at the item or product family level. For example, you can choose to plan in the mid to long range at the product family level and plan to item-level detail within the short-range.

If you have combined your resources into groups, you can use the Resources row to define the planning horizons for which you want your capacity plan to be stated at the individual or group resource level.

Routings required to produce the items within a product family may be similar. If you have created bills of resources to represent routings that apply to product families, you can use the Routings row to define the planning horizons for which you want your resource plan calculations to be based on either routings or bills of resources.

## Organization Tabbed Region

### Organization Tabbed Region



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### Organization Tabbed Region

When setting unconstrained plan options in the Organization tabbed region, make note of the following:

- **Organizations:** The inventory organizations that the planning engine should plan.
- **Demand schedules:** The demand to be fulfilled by this plan
- **Net WIP:** The planning engine recognizes discrete jobs as scheduled receipts.
- **Net Reservations:** The planning engine does not plan for you to use reserved inventory.
- **Net Purchases:** The planning engine recognizes purchase orders and purchase requisitions as scheduled receipts.
- **Plan Safety Stock:** The planning engine plans safety stock inventory.
- **Include Sales Order:** The planning engine considers sales order demand.

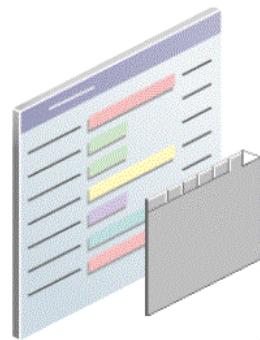
In the Org Selection region, choose All or Multiple Organizations from the list of values to indicate the scope of the plan. When Multiple Organizations is selected, only the inventory organizations listed on the Organizations tab are included in the named plan.

In the Demand Schedules region, specify the names of the demand schedules that will drive your plan. In the Supply Schedules region, specify the names of independent replenishment plans that the advanced plan must work around as given sources of supply.

If you are using global forecasting, in the Global Demand Schedules region, enter the name and ship to consumption level of Oracle Demand Planning global forecasts that will drive your plan.

## Constraints Tabbed Region

### Constraints Tabbed Region



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### Constraints Tabbed Region

Even though unconstrained plans do not use constraints, you must attend to several plan options in the Constraints tabbed region. When setting unconstrained plan options in the Constraints tabbed region, make note of the following:

- **Constrained Plan:** Verify that this is clear
- **Calculate Resource Requirements:** Unconstrained plans generate messages noting the supplier and resource constraints that are exceeded by the plan if the violation is sufficient to pass the message filter values specified on the applicable Exception Set.

## Launching Plans

### Launching Plans

- **Navigate to the Launch window**
- **Set program parameters**
- **Submit request to concurrent manager**

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### Launching ASCP Plans

After you have defined your plan options, you use the Launch window to initiate the planning calculations. Use the Advanced Supply Chain Planner responsibility to navigate to the request Launch (DRP/MPS/MRP) window.

(N) Supply Chain Plan > Names (B) Launch

When you first open the Launch window or when you click the Parameters field located in the Launch window, the Parameters window opens. Note the following:

- Select your plan name from the list of values
- Indicate whether you want to launch a new snapshot of the transaction system prior to running the plan, and whether you want to launch the planner
- The anchor date is used in rate-based planning to indicate the beginning date of planning periods.
- As appropriate, enter or select values for Enable 24x7 ATP, Release Reschedules, and Snapshot Static Entries.
- Submit your concurrent request. When you click the Launch button, the Run Request window opens. Click the Submit Request button.

The Snapshot field defaults to Yes. It is required that a snapshot be taken for the first plan that you run. After that, the snapshot needs to be taken when you have changed something on the data collection, which is most of the time. The total time required to regenerate a plan is reduced when you do not take a snapshot.

## Quiz

### Quiz

**Plan options that apply regardless of plan type or class are called:**

- 1. General plan options**
- 2. Constrained plan options**
- 3. Common plan options**
- 4. Aggregated plan options**

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**Answer:** 3. Common plan options

## Quiz

### Quiz

**The Material Scheduling Method plan option instructs the planning process when to make component material available for make at items.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Summary

### Summary

**In this module, you should have learned how to:**

- **Describe planning concepts**
- **Describe creating plans**

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# **Demand and Supply**

## **Chapter 4**

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# 4

## **Demand and Supply**

### **Advanced Supply Chain Planning Fundamentals**

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## Objectives

### Objectives

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

- **Describe demand types**
- **Describe sales orders**
- **Describe forecast consumption**
- **Describe supply types**
- **Review demand and supply**

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## Module Overview: Topics

### Module Overview: Topics

- **Demand types**
- **Sales orders**
- **Forecast consumption**
- **Supply types**

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## Topic Overview: Demand Types

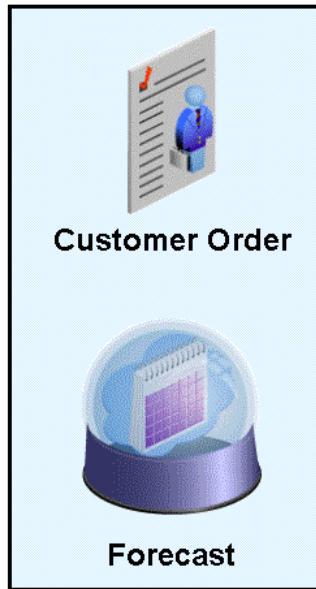
### Topic Overview: Demand Types

- **Independent**
- **Dependent**
- **Safety stock: Inventory Optimization**
- **Safety stock: Inventory**
- **Safety stock: Planning**

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## Independent

### Independent



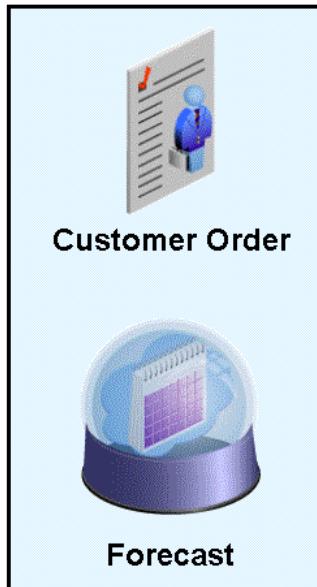
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## Independent

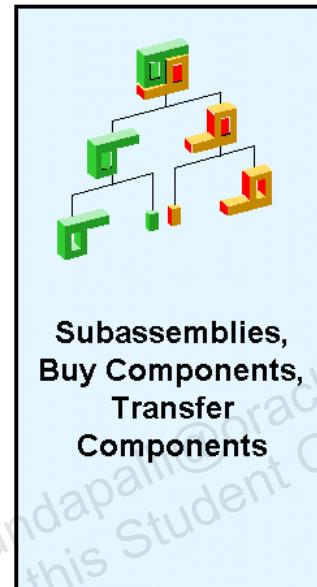
Independent demand is demand that does not depend on a need from another item in the bill of material. It usually applies to top-level items but can apply to lower-level items as in spares demand.

## Dependent

### Dependent



Independent Demand



Subassemblies,  
Buy Components,  
Transfer  
Components

Dependent Demand

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#### Dependent

Dependent demand is demand that depends on a need from another item in the bill of material as during the requirements explosion.

## Safety Stock: Inventory Optimization

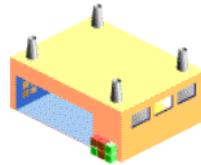
### Safety Stock: Inventory Optimization



Fabrication plant



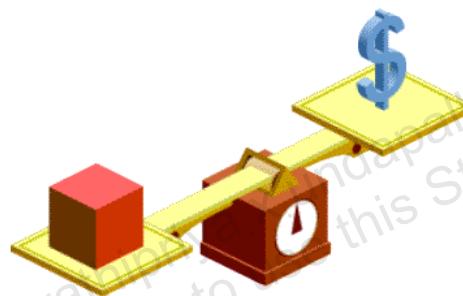
Assembly plant



Distribution centers



Customers



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### Safety Stock: Oracle Inventory Optimization

Safety stock is extra on hand material that you request as a cushion to cover unexpected demand. Use Oracle Inventory Optimization to suggest time-phased safety stock levels for your bill of material items in all of your supply chain organizations.

You specify:

- Service levels by customer, channel, and product
- Variability: Demand and supplier lead time
- Objectives and penalty costs for your enterprise

Oracle Inventory Optimization determines the optimal inventory for each product in each time period by trading off:

- Customer service level against inventory investment, production and procurement cost, revenue and profit.
- Delivery time against flexibility. It determines the best place to hold inventory and may recommend inventory postponement.
- Delivery variability against procurement cost. It creates purchasing budget recommendations and supplier recommendations.

By having the capability to compare alternative scenarios, you can choose the best inventory investment strategy.

You send those results into the planning engine as safety stock demands and the planning engine plans supply to meet them.

## Safety Stock: Inventory

### Safety Stock: Inventory

PERIODS	1	2	3	4
Gross Requirements	100	300		500
Scheduled Receipts				
Net Requirements	140	300		500
Planned Order Due	140	300		500
Projected Available	10	50	50	50

Manual

Mean absolute deviation

Safety Stock = 50

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## Safety Stock: Inventory

If you do not use Oracle Inventory Optimization, you can specify the amount of safety stock that you want in Oracle Inventory as:

- **Manual:** A fixed number.
- **User-defined percentage:** A percentage of demand.
- **Mean absolute deviation:** The difference between planned for and actual orders in history.

In this example, the planning process always leaves 50 units in stock as safety stock.

## Safety Stock: Planning

### Safety Stock: Planning

PERIODS	1	2	3	4
Gross Requirements	100	300		500
Scheduled Receipts				
Net Requirements	157	367		450
Planned Order Due	157	367		450
Projected Available	10	67	134	134
				84

Item attributes

Safety Stock Bucket Days = 3

Safety Stock Percent = 50%

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### Safety Stock: Planning

Instead of specifying safety stock in Oracle Inventory, you can specify it for the planning process as item attributes. The planning process plans safety stock to a percentage of demand over a certain time period.

In this example, the planning process plans safety stock for period 1 as 50% of the average demand in periods 1 through 3.

## Topic Overview: Sales Orders

### Topic Overview: Sales Orders

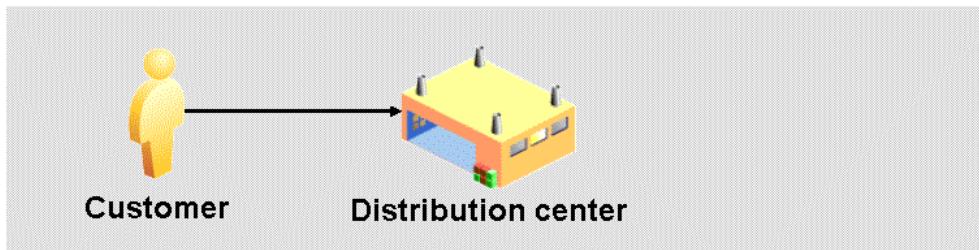
- External and internal
- Plan to request/schedule/promise dates
- Sales order entry process
- Processing cycle
- Demand priority

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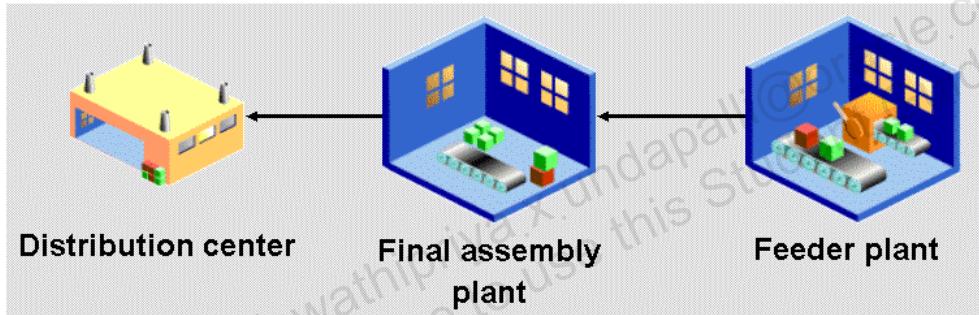
## External and Internal

### External and Internal

#### External



#### Internal



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### External and Internal

External demand comes from customers.

Internal demand comes from another facility in your organization. This demand appears in Oracle Applications as an internal sales order against your facility. Internal sales orders are dependent demand from the planning engine perspective because they result from an internal requisition.

## Plan to Request/Schedule/Promise Dates

### Plan to Request/Schedule/Promise Dates



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### Plan to Request/Schedule/Promise Dates

Sales order lines have multiple dates. You can instruct the planning process to plan to one of these dates through a plan option. The planning engine uses the plan option against all sales order lines that it plans. It places the appropriate date from each sales order line in the planning field Suggested Due Date and uses that as the date that supply orders need to meet to fulfill the demand. In the plan option, you can select:

- The date by which the customer requests you to ship the material; in Oracle Order Management, this is Request Date.
- The date by which the customer requests you to have the material arrive; in Oracle Order Management, this is Request Date.
- The date that you promise the customer that you will ship the material; in Oracle Order Management, this is Promise Date.
- The date that you promise the customer that you will have the material arrive; in Oracle Order Management, this is Promise Date.
- The date you expect to ship the item; in Oracle Order Management, this is Schedule Ship Date.

- The date you expect the item to arrive; in Oracle Order Management, this is Schedule Arrival Date.

For Oracle Order Management Request Date and Promise Date, you should select the plan option choice that corresponds to the way that your Oracle Order Management uses the field.

## Sales Order Entry Process

### Sales Order Entry Process

- **Enter Sales order header information:**
  - Customer name or number
  - Order type
- **Order line information:**
  - Item
  - Quantity
  - Unit of Measure
- **Book the sales order**
- **Schedule the sales order**

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#### Overview of Sales Orders

You can enter, view, and update sales orders using the Sales Orders window. You can order standard items and configurations using this window. You can also adjust pricing, assign sales credits, record payment information, attach notes, schedule shipments, query item availability, and reserve stock in selected subinventories.

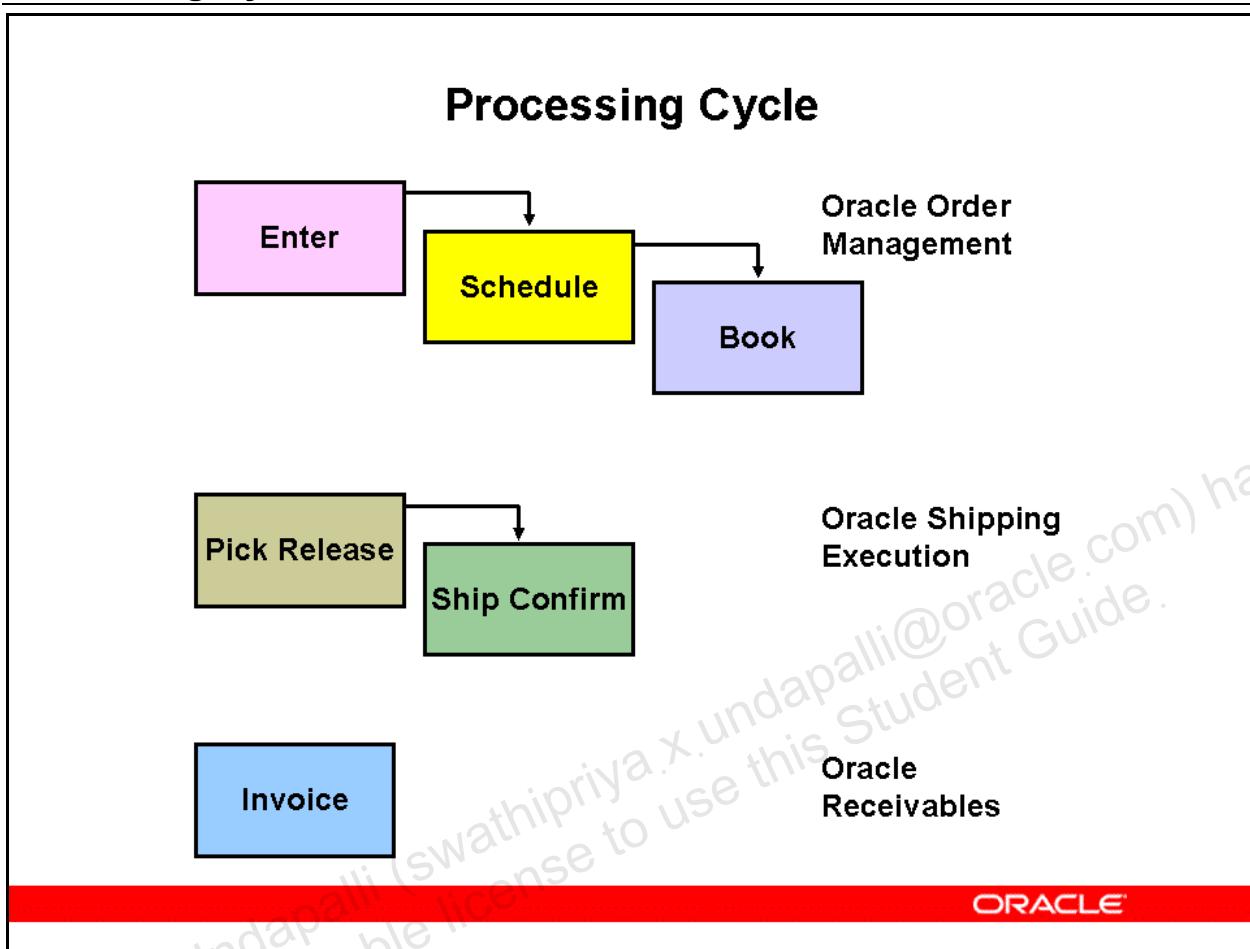
You can enter information in the Sales Orders window as you receive it. Order Management validates individual fields as they are entered. On the **Sales Order** Main Tab, Customer name or Customer Number and Order Type fields contain required information.

On the **Order Lines** Main Tab, Item identifier, Order Quantity, and Unit of Measure are required information. On the Line Items Shipping Tab, the Source Type field determines whether an order will be fulfilled from an internal source or by an external supplier.

The **book order** process causes Order Management to validate that all required fields have values, that configurations are complete, and so on. After an order has been booked, it becomes eligible for the next step in its workflow.

Most manufacturing processes in Oracle Applications do not interact directly with Oracle Order Management. They use **sales order** information in the supply/demand portion of Oracle Inventory. You use the schedule order process to create sales order information in the supply/demand portion of Oracle Inventory.

## Processing Cycle



### Processing Cycle

Sales orders pass through processing cycles which involves several modules of Oracle Applications. The major processing steps are:

- **Enter:** Place the customer's wishes into Oracle Applications
- **Schedule:** Calculate schedule dates and make sales order visible to manufacturing as demand
- **Book:** Validate the completeness and correctness of the order

The sequence of Book and Schedule depends on how your enterprise configures Oracle Order Management.

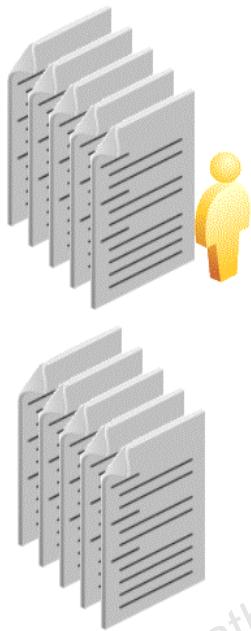
You can either set (M) Tools > Auto schedule to On or use (M) Tools -> Schedule. In both cases, you perform available to promise checking. Successful available to promise sets the Schedule Ship Date field is populated.

- **Pick release:** Select the material for picking
- **Ship confirm:** Mark the material as shipped and no longer visible to manufacturing as demand
- **Invoice:** Bill the customer

The collections and planning processes plans to satisfy sales order demand from the time that the sales order line is scheduled until the sales order line quantity is completely ship confirmed. Planning neither collects nor plans for drop ship sales order lines.

## Demand Priority

### Demand Priority



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#### Demand Priority

You can set a priority for sales order line demands; lower numbers indicate a higher priority. In some methods of planning and pegging, the planning process plans supplies and assigns supplies to demands with higher priority first.

## Quiz

### Quiz

**The lower a demand priority value, the lower its importance.**

- 1. True**
- 2. False**

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**Answer:** 2. False

## Topic Overview: Forecast Consumption

### Topic Overview: Forecast Consumption

- **Forecasts: Demand Planning**
- **Forecasts: Transaction Data Store**
- **Forecast consumption overview**
- **Consumption days**
- **Days**
- **Weeks**
- **Periods**
- **Multiple bucket types**
- **Forecast consumption flow options**
- **Forecast bucket consumption**
- **Demand classes**

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## Forecasts: Demand Planning

### Forecasts: Demand Planning



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### Forecasts: Demand Planning

Forecasts represent expected shipments of goods possibly due to customer orders that you expect to receive

You create and maintain forecasts in Oracle Demand Planning. Demand plans consist of:

- Names
- Items
- Dates
- Quantities
- Units of measure
- Average discount
- Calendar
- Category sets
- Bucket types: You can forecast by days, weeks, and periods

## Demand Planning Cycle

Oracle Demand Planning provides functionality to help you build consensus forecasts with participation from a wide variety of collaborators and provides tools for tracking the changes and evaluating whether those changes tend to improve or decrease forecast accuracy:

- Collect item, organization, and sales history information from transaction data store to demand planning data store.
- Distribute data to planners/collaborators from demand planning data store.
- Create and modify forecasts and upload final forecasts to demand planning data store.
- Publish demand planning data store to planning data store.

## Scenarios

One demand plan can include multiple scenarios. Scenarios can be defined to represent forecasts from different sources such as marketing, sales, customers, or statistical. They also can be used to model different sets of supposed events, such as optimistic and pessimistic assumptions of business conditions. Inventory Optimization uses many scenarios, along with a probability of occurrence for each scenario, to construct a cumulative probability distribution. The cumulative distribution is in turn used in calculating safety stock inventory to achieve a specified service level.

## Forecast Spreading

If you develop and maintain your Oracle Demand Planning forecasts in aggregate (week, month, or quarter), you can:

- Use those forecasts in Oracle Advanced Supply Chain Planning
- Instruct the planning engine to spread this aggregate forecast demand evenly across the daily buckets from the workday calendar

Planning forecast demand in daily buckets may provide a more realistic estimate of the future supply but forecasting in aggregate may lead to more accurate forecasts.

## Forecasts: Transaction Data

### Forecasts: Transaction Data



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#### Forecasts: Transaction Data

If you do not use Oracle Demand Planning, you can create and maintain forecasts in Oracle Master Scheduling/MRP in the transaction data. You collect those forecasts to the planning data.

Transaction data store forecasts consist of the same data as forecasts in Oracle Demand Planning and also have:

- **Forecast sets:** All forecasts belong to a forecast set. You can have multiple forecast sets and multiple forecasts in a forecast set. If you have one forecast, you must place it in a forecast set.
- **Methods:** Where the forecasts come from--manual, external, focus, statistical, aggregate, other organizational.
- **Levels:** The level of detail of the forecast entries--item, customer, bill-to, ship-to.
- **Controls:** Whether the forecast is subject to forecast consumption--yes, no.

## Forecast Bucket Types

### 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

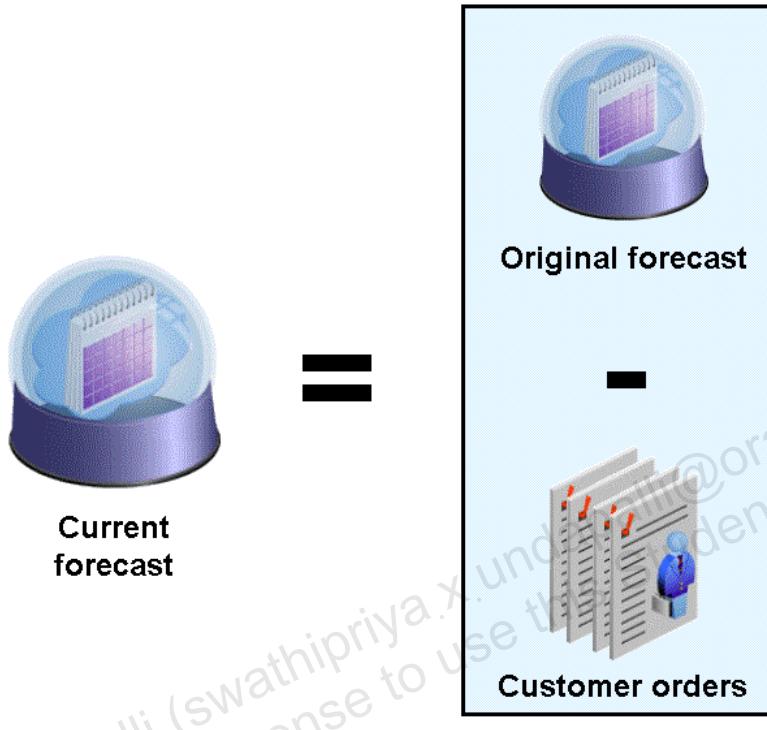
You use forecast bucket types to specify the time period that a forecast entry covers. Choose one of the following time periods and assign it to each forecast entry:

- 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 forecast 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 last day of the week, and 15 units on Wednesday.

## Forecast Consumption Overview

### Forecast Consumption Overview



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### Forecast Consumption Overview

Forecast consumption is the process of decreasing a forecast quantity by the quantity of a sales order that the forecast expects. You can use forecast consumption if you want to.

For example:

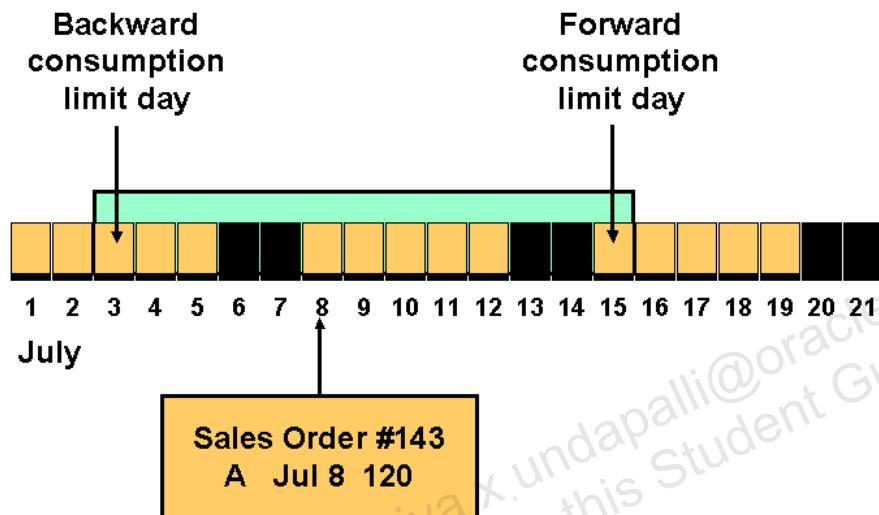
- You create a forecast for 100 units in June. The requirements explosion plans for supplying 100 units in June based on the forecast.
- You receive a sales order for 10 units due in June. It is most likely that sales will still be around 100 units, and that the 10 units sold are just part of the anticipated normal demand activity. The sales order demand reduces the forecast demand to 90 from 100. The requirements explosion plans for supplying 100 units in June--90 on behalf of the forecast and 10 on behalf of the sales order.

When you sell fewer units than you forecast; 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. When you sell more units than you forecast, the current forecast quantity does not drop below zero. To record the extra sales order quantity, the forecast consumption process creates an extra forecast entry (overconsumption entry) with the following characteristics:

- The original forecast is set to zero
- The current forecast is the extra sales order quantity expressed as a negative number
- The date is the sales order line date

## Consumption Days

### Consumption Days



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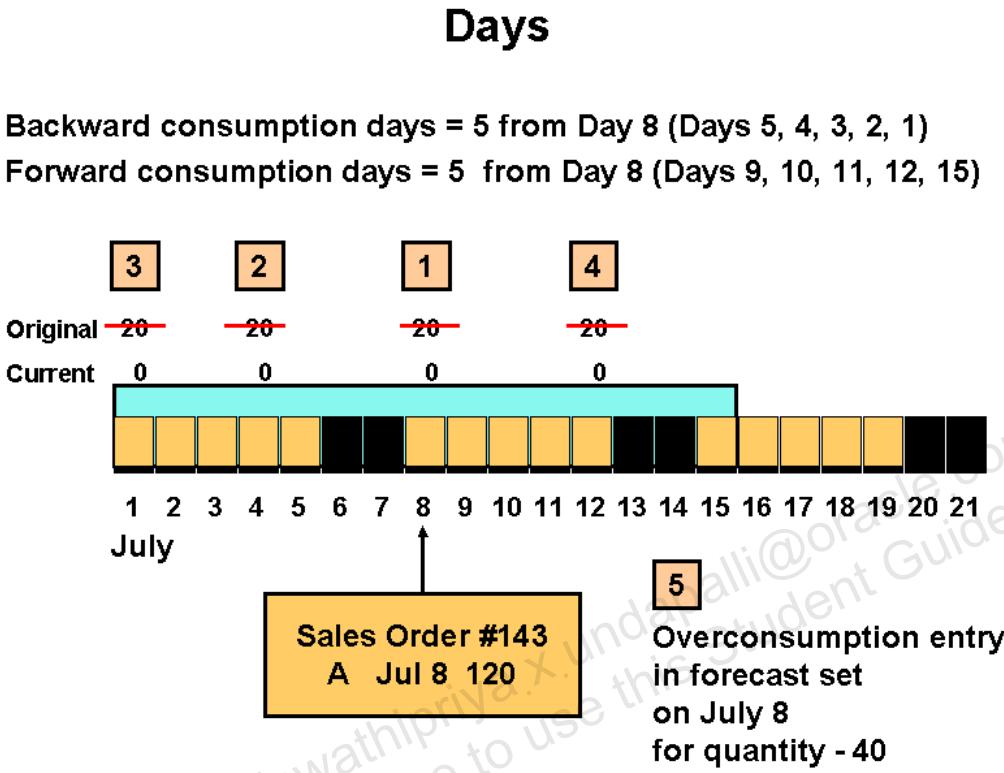
### Consumption Days

When you set consumption days, you set a window around the sales order line date. The forecast consumption process can consume against forecasts within that window. This type of forecast consumption is called backward/forward days consumption.

Backward and forward consumption days determine what happens when sales order dates do not exactly align with forecast dates.

Weekly and periodic forecasts are treated as though all sales are expected to occur on the last day of the week or period.

## Days

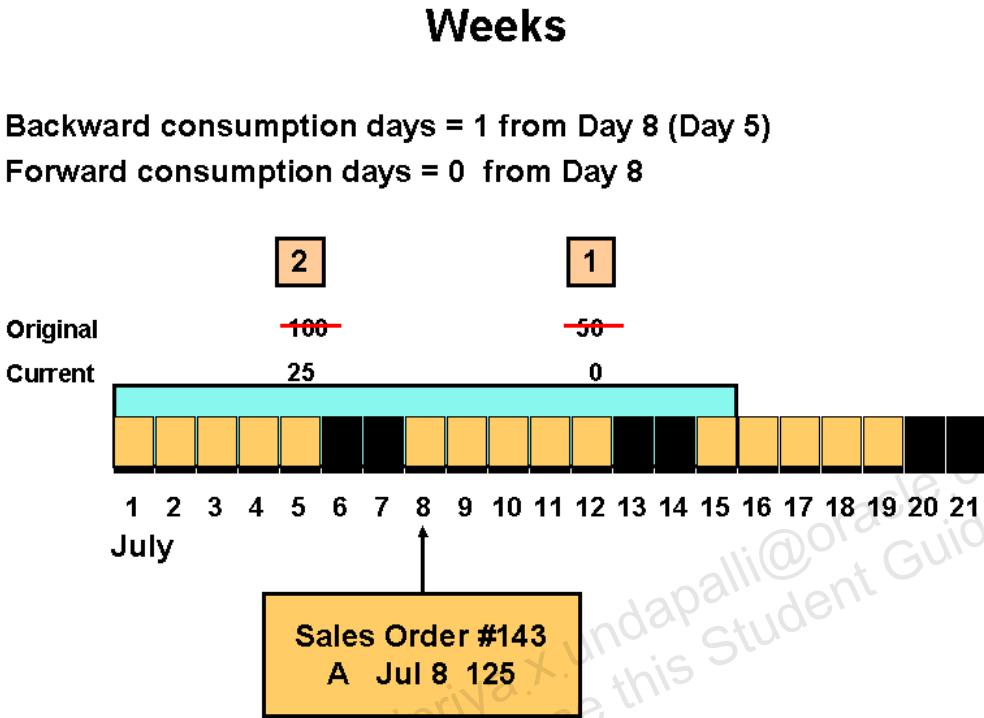


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## Days

In this example, the forecast consumption process consumes daily forecasts within the consumption window. After it consumes all of the forecasts that it can, it records the remaining sales order quantity as forecast overconsumption.

## Weeks



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## Weeks

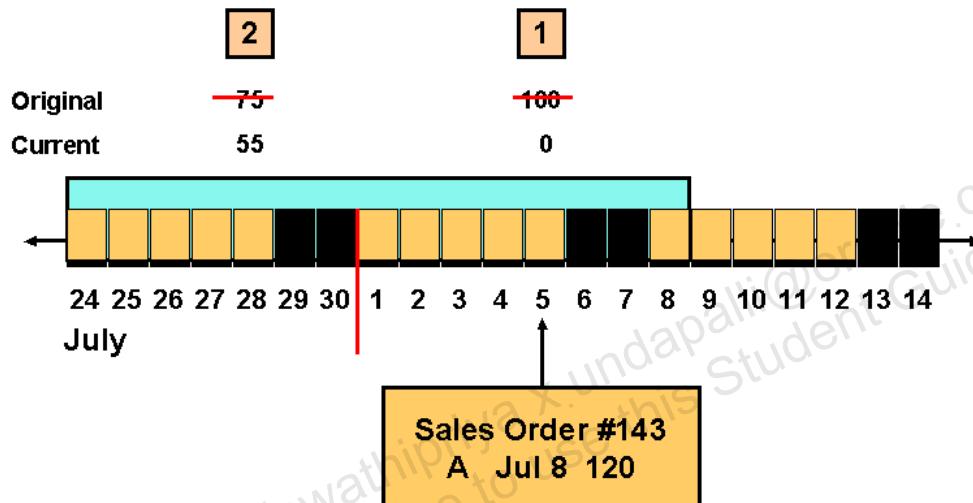
When performing forecast consumption for weekly forecasts, the consumption process consumes against the forecast for any sales order that is due within the week. For example, sales orders due on days 8 through 12 consume the weekly forecast on day 8.

## Periods

### 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)**

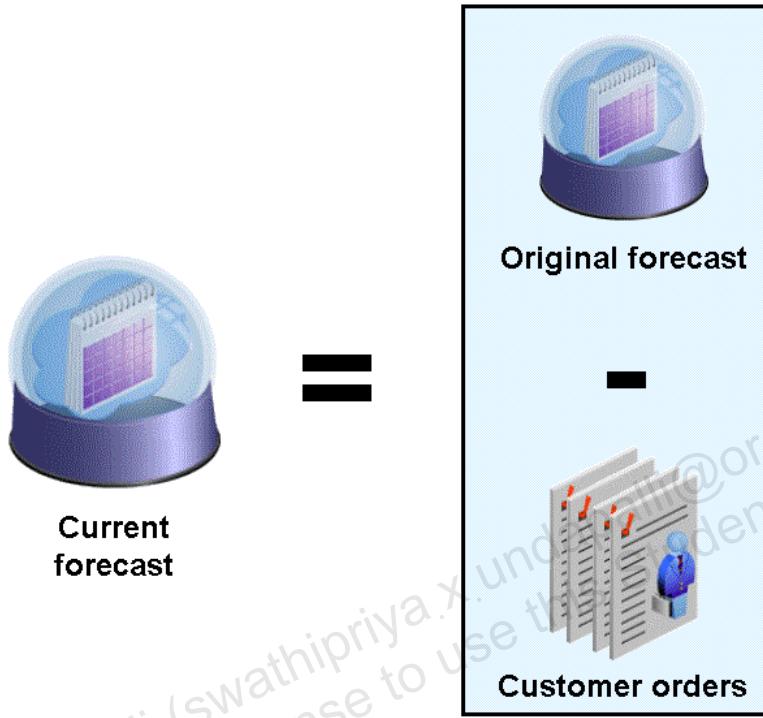


## Periods

When performing forecast consumption for period forecasts, the consumption process consumes against the forecast for any sales order that is due within the period. For example, sales orders due on days 1 through 31 consume the period forecast on day 1.

## Multiple Bucket Types

### Multiple Bucket Types



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### Multiple Bucket Types

If the forecast consumption process can consume against multiple bucket types, it consumes against daily forecasts first, then weekly forecasts, then against period forecasts.

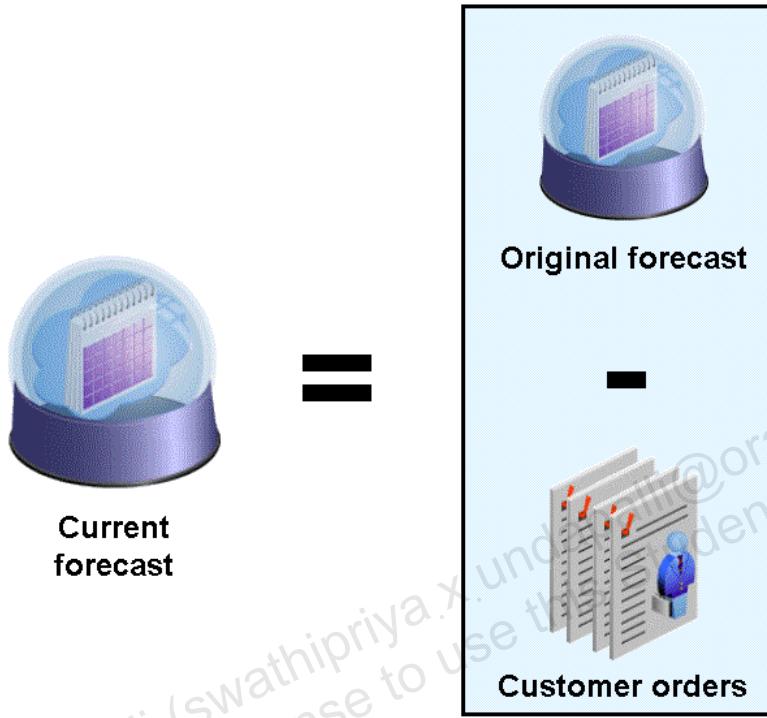
If you have a combination of daily, weekly, and periodic forecasts for one item, the Planning Manager consumes forecast entries according to the following procedure:

1. 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
2. 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

3. 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

## Forecast Consumption Flow Options

### Forecast Consumption Flow Options



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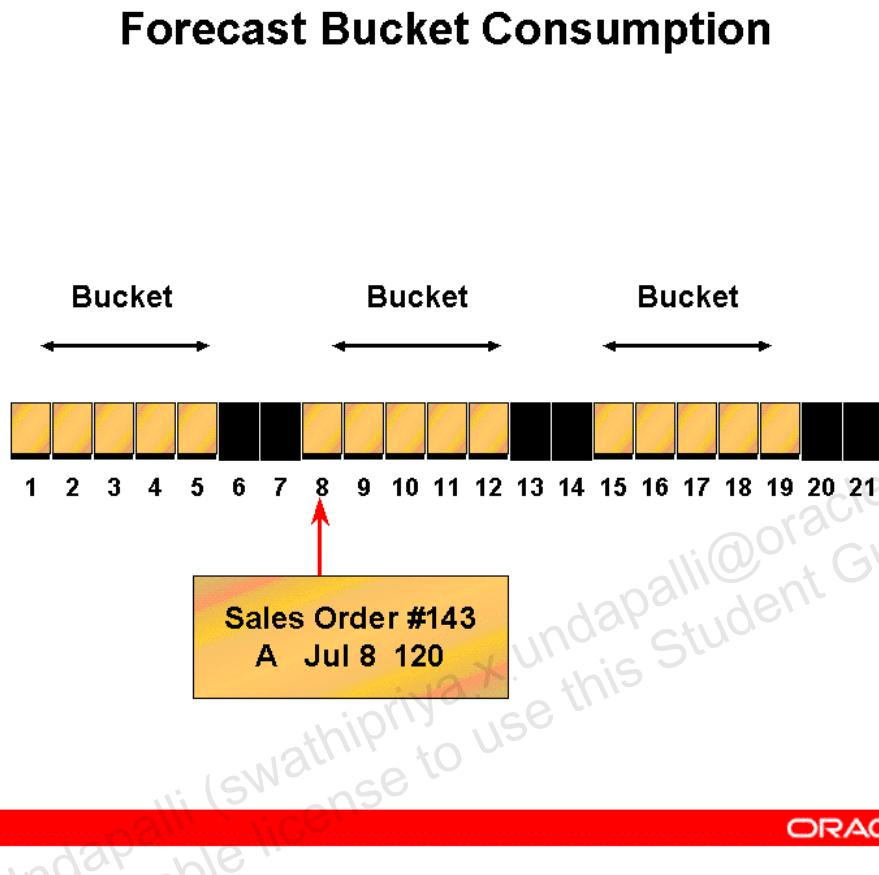
### Forecast Consumption Flow Options

If you enter your forecasts in Oracle Demand Planning, the planning process consumes the forecasts at the beginning of its processing.

If you enter your forecasts in the source instance, you can:

- Have the forecast consumption process consume forecasts there on a regular basis. Then, you have the collection process collect the current forecast quantities.
- Have the collection process collect the original forecast quantities and have the planning process consume the forecasts at the beginning of its processing.

## Forecast Bucket Consumption



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### Forecast Bucket Consumption

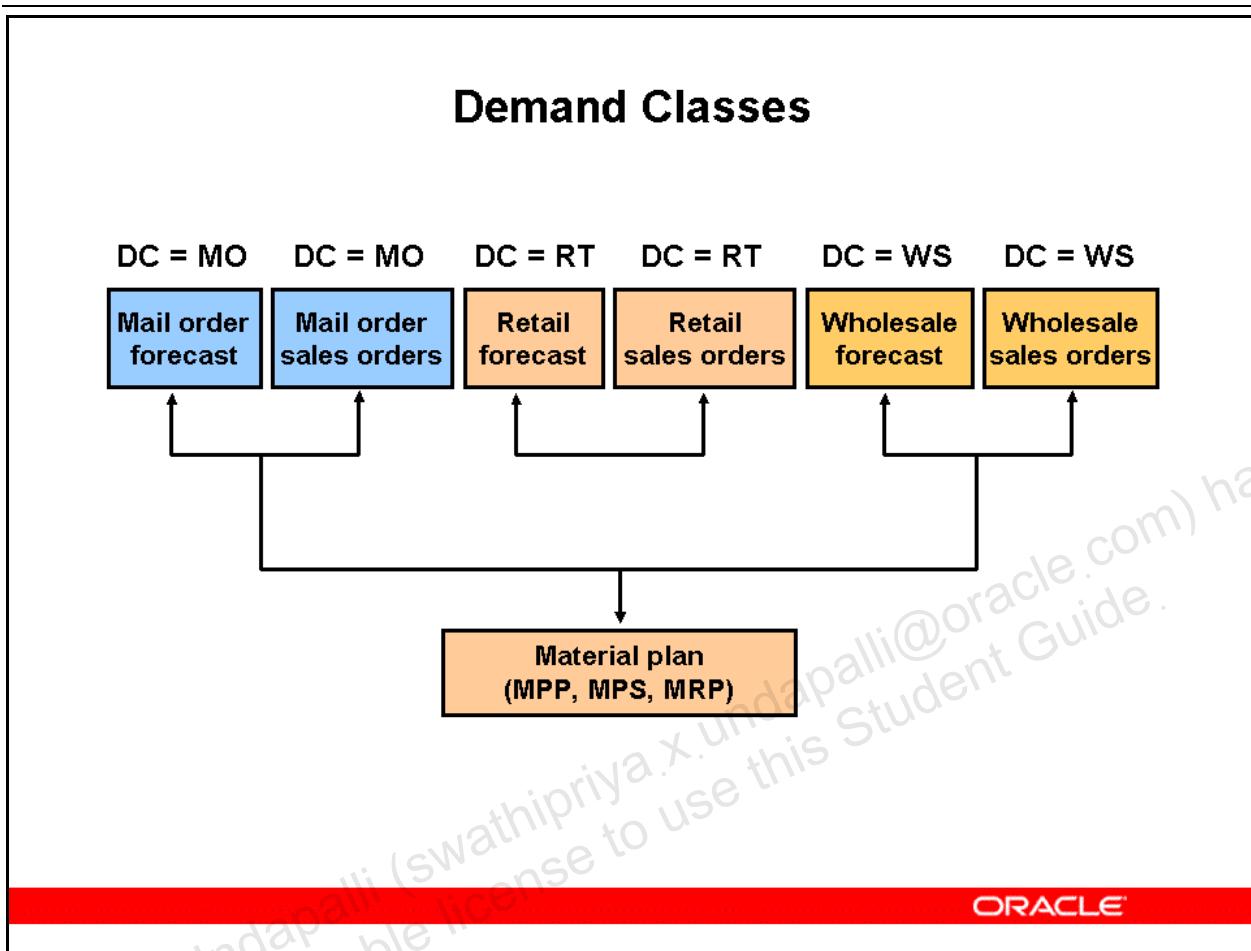
If you have the planning process perform forecast consumption at the beginning of its processing, you can use forecast bucket consumption as an alternative to backward/forward days consumption.

In forecast bucket consumption, you instruct the planning engine to consume only within the consumption bucket. The consumption bucket is the same length as the forecast bucket.

For example, if you have weekly forecasts, only sales orders on day 8 through day 12 consume the forecast for that week. If it needed more forecasts to consume for the sales order on day 8, it could use:

- Existing daily forecasts on day 8 only
- Existing period forecasts that cover day 8

## Demand Classes



### Demand Classes

You can use demand classes to group forecasts and sales orders by type for forecast consumption.

## Supply Types Overview

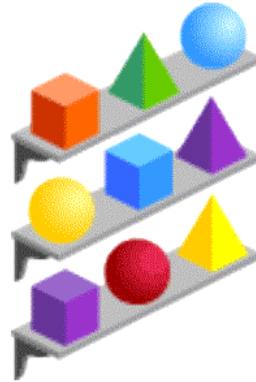
### Supply Types Overview

- **On hand**
- **Scheduled receipts**
- **Purchase requisitions**
- **Purchase orders**
- **Scheduled receipts for make items**

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## On Hand

### On Hand



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### On Hand

On hand is material available in nettable subinventories except material that has a reservation against it.

A nettable subinventory is a subinventory that you have marked as available for production; the planning engine considers its inventory as on-hand. A material review board or engineering inventory may be a non-nettable subinventory.

## Scheduled Receipts

### Scheduled Receipts

ITEM A	1	2	3	4	5
Gross Requirements	80	80	200	200	200
Scheduled Receipts	110	110	110	110	

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### Scheduled Receipts

Scheduled receipts are material on order, for example, discrete jobs and purchase orders.

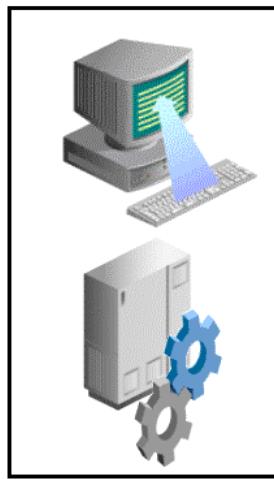
The planning process cannot change scheduled receipt quantities and dates but it can recommend that you do.

In this example, it recommends that you reschedule a scheduled receipt from period 4 to period 3. It issues a recommendation and notes the suggested position of the scheduled receipt as a current scheduled receipt.

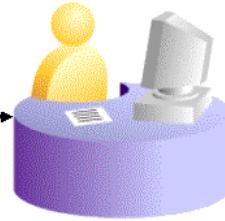
The planning process plans lower levels of the bill of material as if you followed its recommendation. If you cannot follow the recommendation, you need to also reschedule the lower level items.

## Purchase Requisitions

### Purchase Requisitions



**Manual Entry  
and  
Production  
Plan**



**Buyer**

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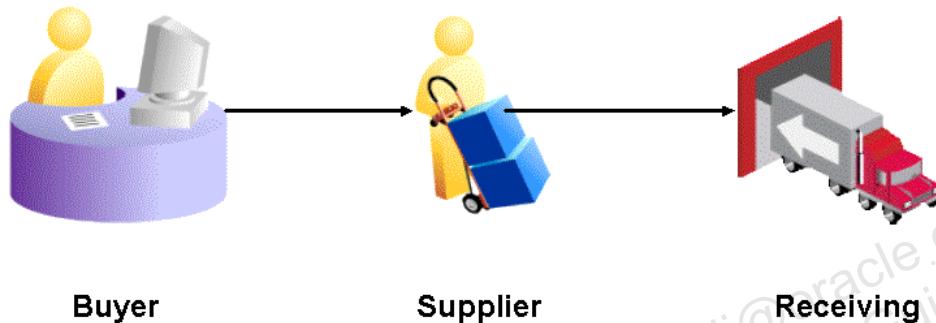
#### Purchase Requisitions

Purchase requisitions are generally requests against the buyers to purchase goods. Oracle Purchasing manages them.

When you release recommendations for buy items from the planning process, they become purchase requisitions. In many organizations, individuals also enter purchase requisitions, for example, the tool crib to replace broken tools and an administrative person to buy a desk.

## Purchase Orders

### Purchase Orders



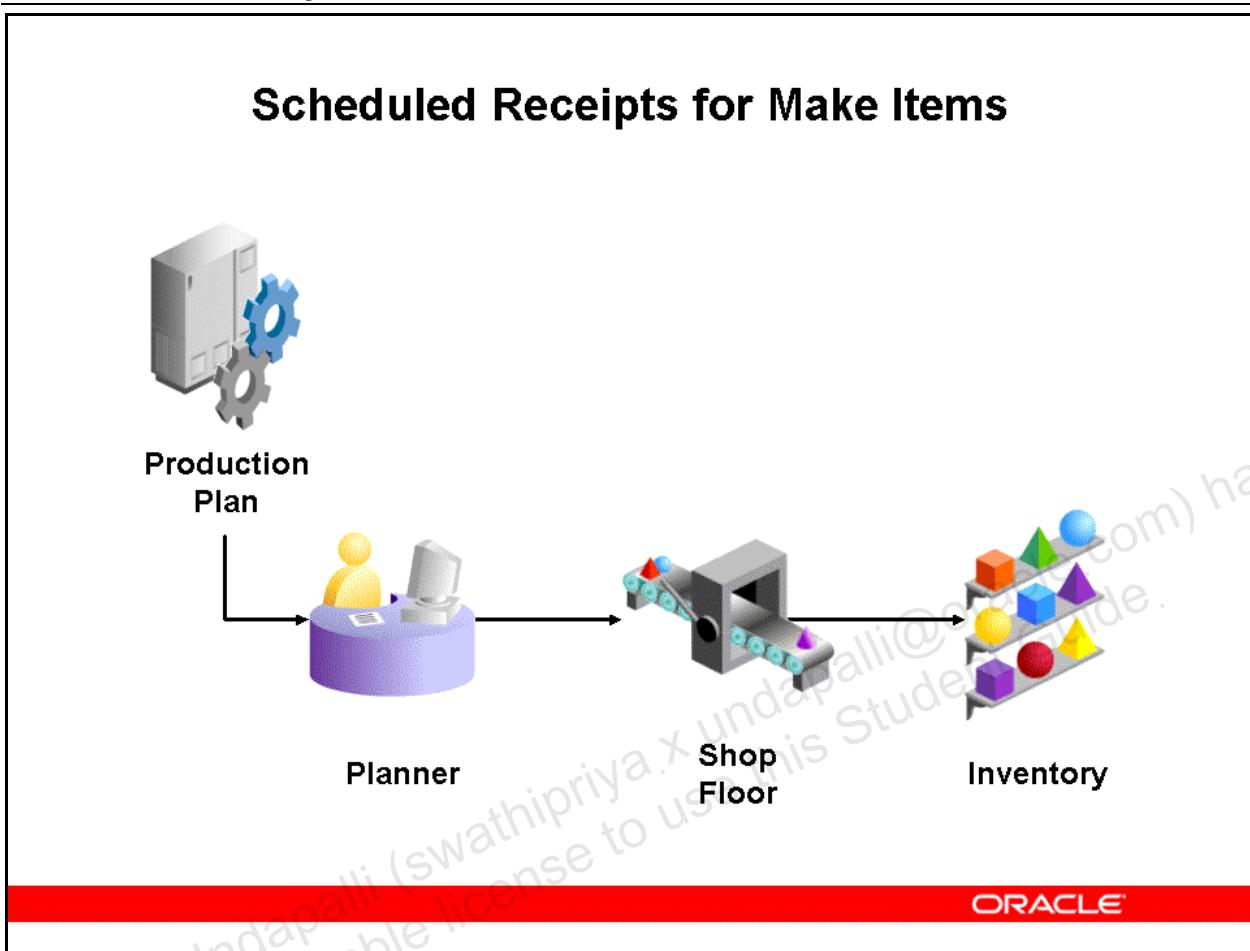
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### Purchase Orders

Purchase orders are orders from your organization against a supplier to provide goods to your facility. Purchase orders typically originate from purchase requisitions.

Oracle Purchasing manages both their issue to the supplier and the receipt and inspection of the goods.

## Scheduled Receipts for Make Items



### Scheduled Receipts for Make Items

These scheduled receipts are orders against your facility to manufacture goods:

- **Batches:** Oracle Process Manufacturing
- **Discrete jobs:** Oracle Work in Process
- **Flow schedules:** Oracle Flow Manufacturing
- **Jobs:** Oracle Project Manufacturing, Oracle Shopfloor Management (OSFM)

## Quiz

### Quiz

**The forecast consumption process consumes against daily forecasts first, then weekly forecasts, then against period forecasts.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Quiz

### Quiz

**The lower a demand priority value, the lower its importance.**

- 1. True**
- 2. False**

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**Answer:** 2. False

## Summary

### Summary

**In this module, you should have learned how to:**

- **Describe demand types**
- **Describe sales orders**
- **Describe forecast consumption**
- **Describe supply types**

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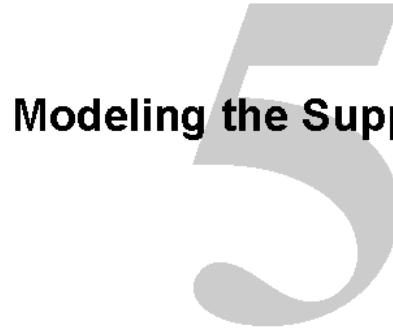
## **Modeling the Supply Chain**

**Chapter 5**

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## **Modeling the Supply Chain**



### **Advanced Supply Chain Planning Fundamentals**

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## Objectives

### Objectives

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

- **View enterprise data**
- **View item data**
- **View material data**
- **View resource data**
- **View sourcing data**
- **View supplier data**
- **View calendar, lead time, and time fence data**
- **View transportation data**
- **Model the supply chain**

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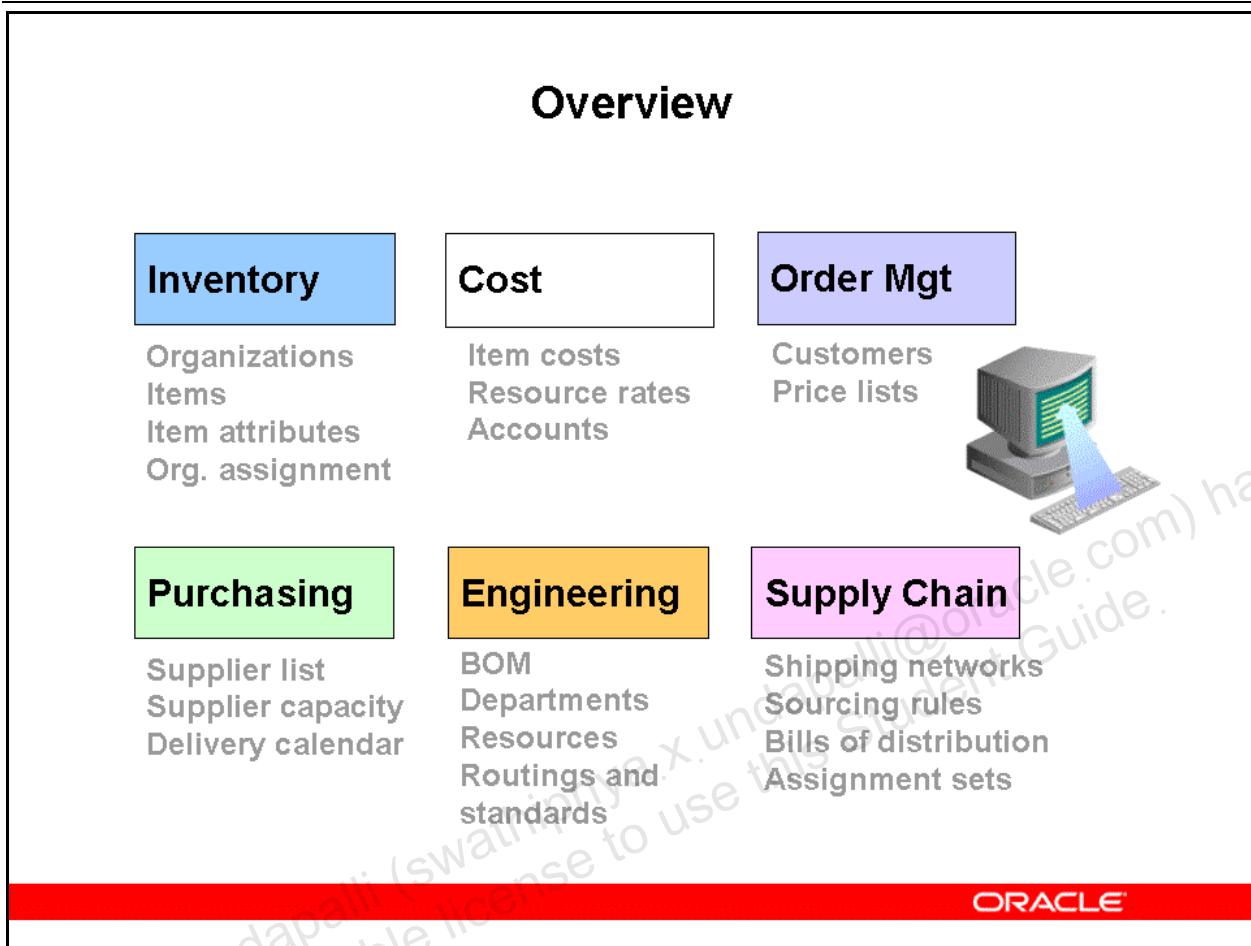
## Module Overview: Topics

### Module Overview: Topics

- Enterprise
- Items
- Material
- Resource
- Sourcing
- Suppliers
- Calendars, lead times, and time fences
- Transportation

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## Overview



## Overview

Setup data is usually maintained only on the transaction sources. One exception is that several planning simulation alternatives can be set up and run on the planning data store without having to re-collect source data. Other exceptions include situations where information is setup directly on the APS destination instance for convenience or in cases where legacy manufacturing applications are not capable of providing enough information to adequately define a supply chain model, for example, supplier capacity.

### Topic Overview: Enterprise

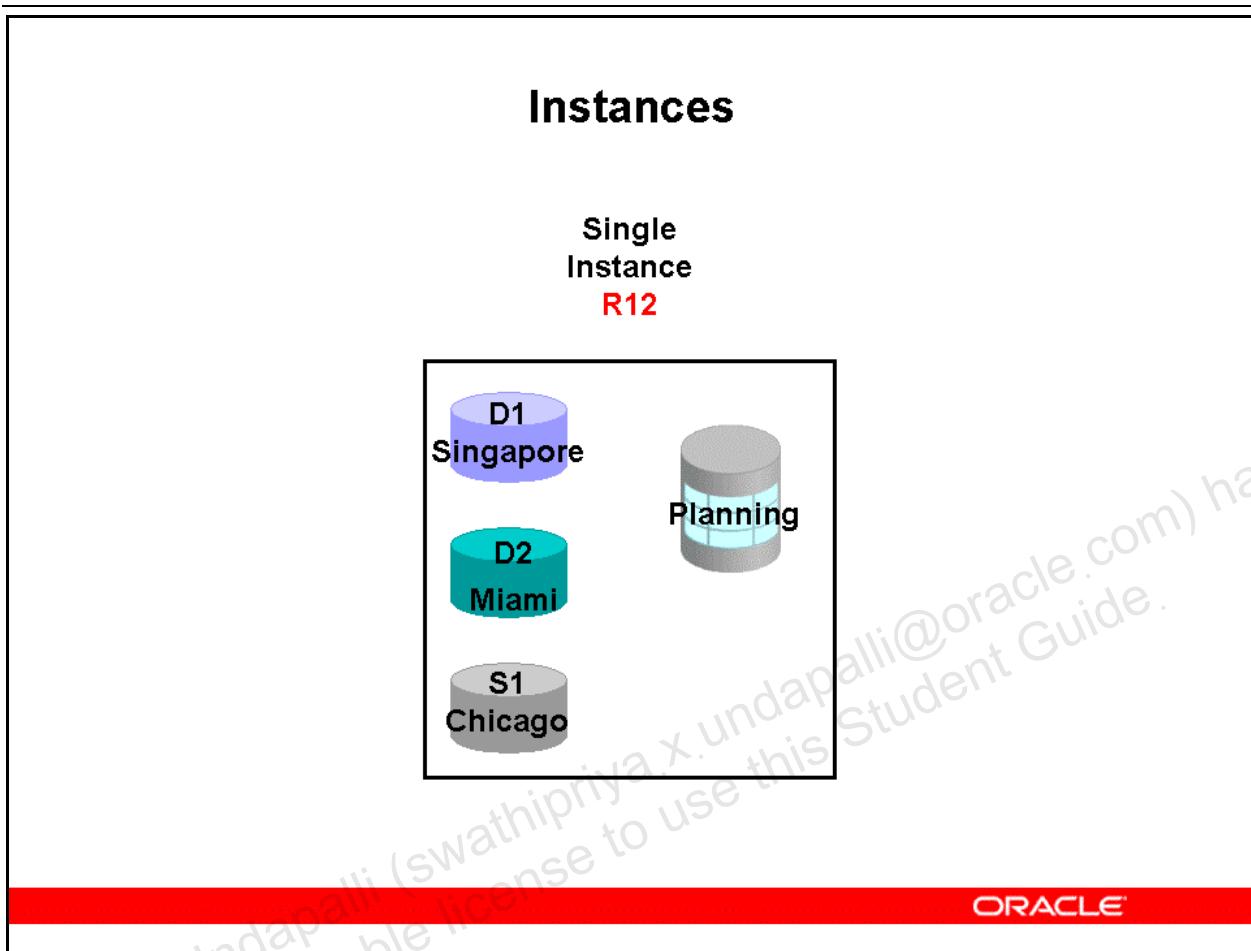
- **Instances**
- **Operating units**
- **Organizations**
- **Subinventories and locators**
- **Setting up organizations**
- **Organizations and subinventories**

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#### Enterprise Topics

This slide lists topics covered in this section of the lesson.

## Instances



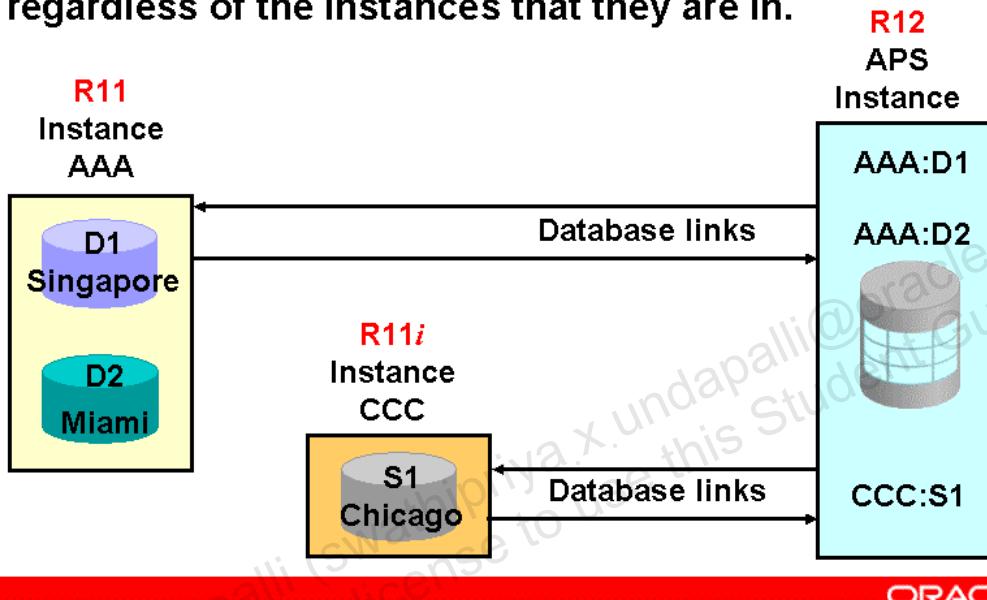
### Instances

An *instance* is a group of data tables or a schema on a particular computer server. This diagram shows all of the transaction data and planning data on one instance.

## Instances

### Instances

You can launch a supply chain plan to plan organizations regardless of the instances that they are in.



### Multiple Instances

The organization codes defined on the APS side include a 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 11 instance named AAA. Using a database link, the data collection program obtains information about organization D1 from the release 11 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.

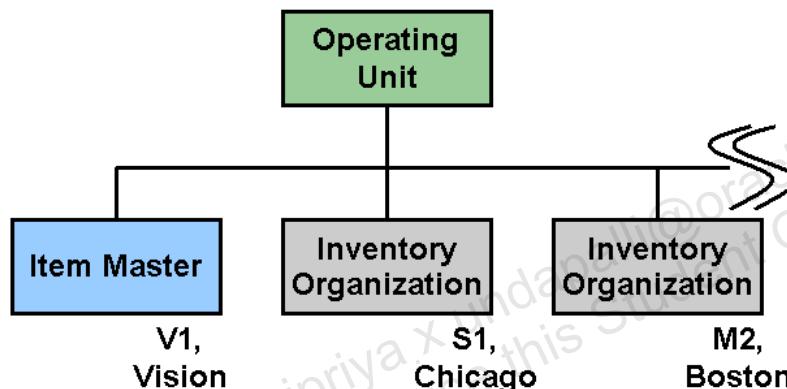
The window used to enter database link addresses also identifies which release version of Oracle Applications is running on the source instance.

You can launch a supply chain plan to plan organizations regardless of the instances that they are in. However, you must perform setup to specify the inter-instance transit times.

## Operating Units

### Operating Units

You can launch a supply chain plan to plan organizations regardless of the operating units or sets of books that they are tied to.



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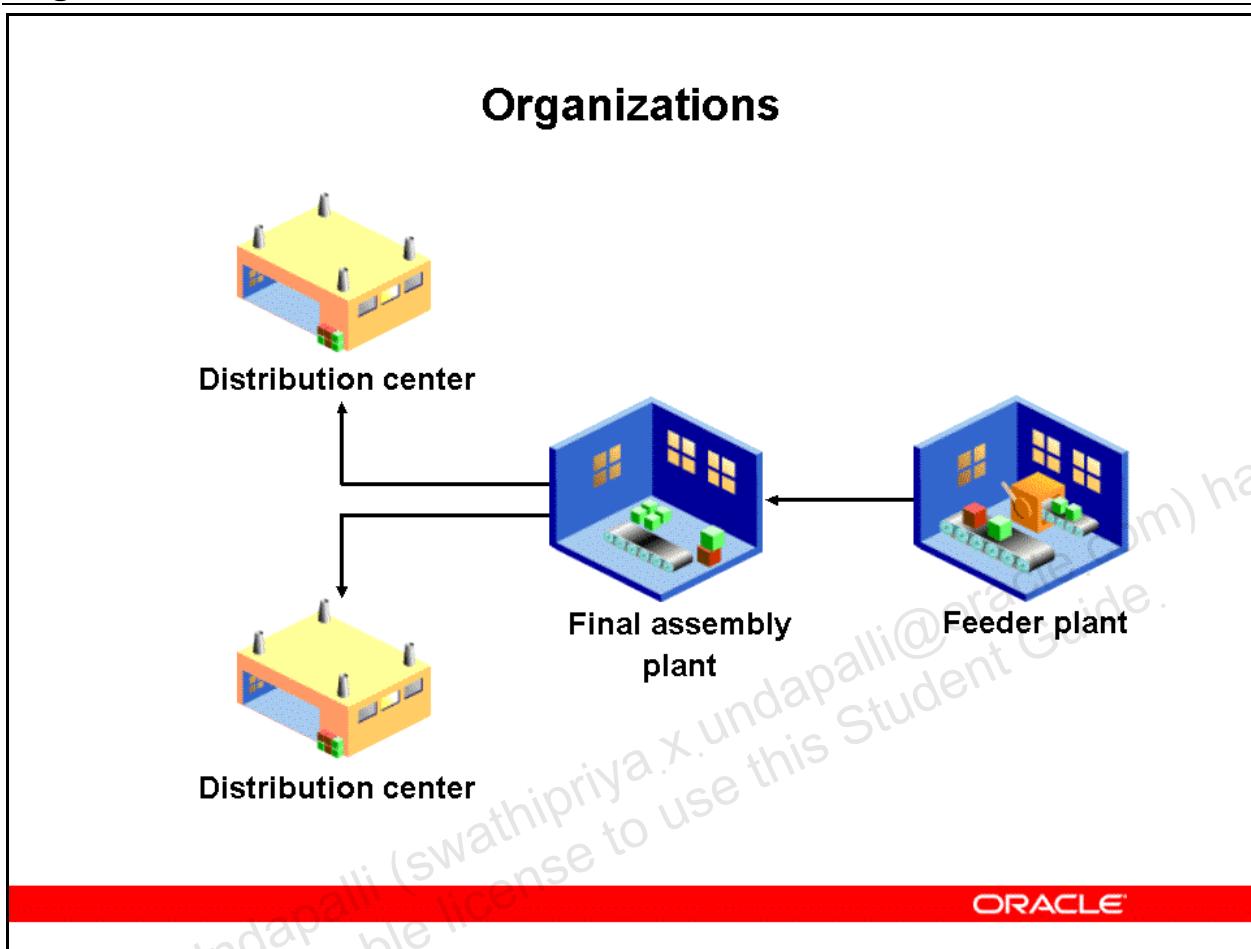
### Operating Units

Each inventory organization reports to one operating unit. The operating unit most closely relates to a division of an enterprise. You can set up more than one operating unit.

Each inventory organization also ties to a set of books which contains the financial chart of accounts.

You can launch a supply chain plan to plan organizations regardless of the operating units or sets of books that they are tied to.

## Organizations



### Organizations

Use organizations to represent your business' facilities or functions.

Typically, if your business has a single physical facility that performs two different functions, for example, a manufacturing plant and a distribution center, you model those as two separate organizations.

Also, if your business has one function located in two separate physical facilities, you typically model those as one organization. If you do model these as one organization, you can create separate subinventories to represent each facility's inventory. Planning does not suggest or create transfers between subinventories. If you need these transfers, you need to model each facility as an organization.

To use certain features of Oracle Advanced Supply Chain Planning, your business may use organizations to represent your customers or suppliers.

### Owning Organization

The owning organization is the organization under whose control you launch the plan. This organization can see all of the results of the supply chain plan for all of the organizations that the planning engine planned.

## Organization Security

### Organization Security



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#### Organization Security

This feature restricts plan information access to authorized individuals. Oracle ASCP allow users to associate job responsibilities to organizations for security purposes. This ensures that you see and change planning data in an organization only if you have a job responsibility associated with the organization.

#### Examples:

- User 1 is restricted to organization M2.
- User 2 has global authorization to access all organizations including organizations M1 and M2.
- User 2 creates a plan for organizations M1 and M2, while specifying the owning organization is M1. User 1 can access this plan, and can view and execute only the portion of this plan related to organization M2.

If you are not authorized for an organization, you cannot view plan names, plan options, and plan results in that organization.

## Subinventories and Locators

### Subinventories and Locators

- **Subinventories**
- **Locators**

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#### Inventories and Subinventories

Subinventories are storerooms.

Locators are row, rack, and bin locations in subinventories.

You can mark subinventories as nettable (for example, production stores) or non-nettable (for example, material review board holding area). The planning engine considers only nettable subinventories as on hand balance.

You can mark a subinventory as nettable as you create or maintain it in Oracle Inventory. In addition, you can change a subinventory's nettable status in a certain plan launch when you set the instructions (plan options) for the plan.

## Setting Up Organizations

### Setting Up Organizations

- **Organization window**
- **Organization Parameters window**
- **Subinventories window**

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#### Inventory Organization

Use the Organization window to enable an organization as an inventory organization. Use the Manufacturing and Distribution Manager responsibility to navigate to the Organization window.

(N) Inventory > Setup > Organizations > Organizations

Use the **Organization Parameters** window to set up the relationship between inventory organizations and the item master inventory organization, and to designate a work calendar.

(N) Inventory > Setup > Organizations > Parameters

Use the **Subinventories** window to define one or more sub inventories for each inventory organization.

(N) Inventory > Setup > Organizations > Subinventories

## Organizations and Subinventories

### Organizations and Subinventories

**While setting up organizations and subinventories, consider:**

- **Inventory transactions occur in subinventories**
- **ASCP does not plan subinventory transfers**
- **Inventory Optimization does not calculate safety stock at the subinventory level**
- **Demand Planning forecasts by organization, not by subinventory**
- **Global Order Promising calculates availability at the organization level**
- **Order Management designates one organization for item validation across the operating unit**

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### Implementing Organizations and Subinventories

When implementing Oracle Applications and setting up inventory organizations, one of the critical considerations is deciding which facilities will be considered as inventory organizations and which will be subinventories.

As an example, a company is thinking about using one main inventory organization to represent all of the facilities located in the same city. They think that it will be easier to maintain. They would use sub inventories to represent the various inventory locations in two manufacturing plants and a distribution center located in the same city.

The above approach usually does not work out in the long run. The company should take into account that the APS suite operates only at the organization level. When multiple facilities are combined into one organization, if at a later date the company needs to plan a transfer from one facility to another, the planning system will not be able to suggest such a transfer.

## Quiz

### Quiz

**Every inventory organization has an operating unit parent.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Quiz

### Quiz

**Inventory Optimization calculates safety stock at the subinventory level.**

- 1. True**
- 2. False**

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**Answer:** 2. False

## Topic Overview: Items

### Topic Overview: Items

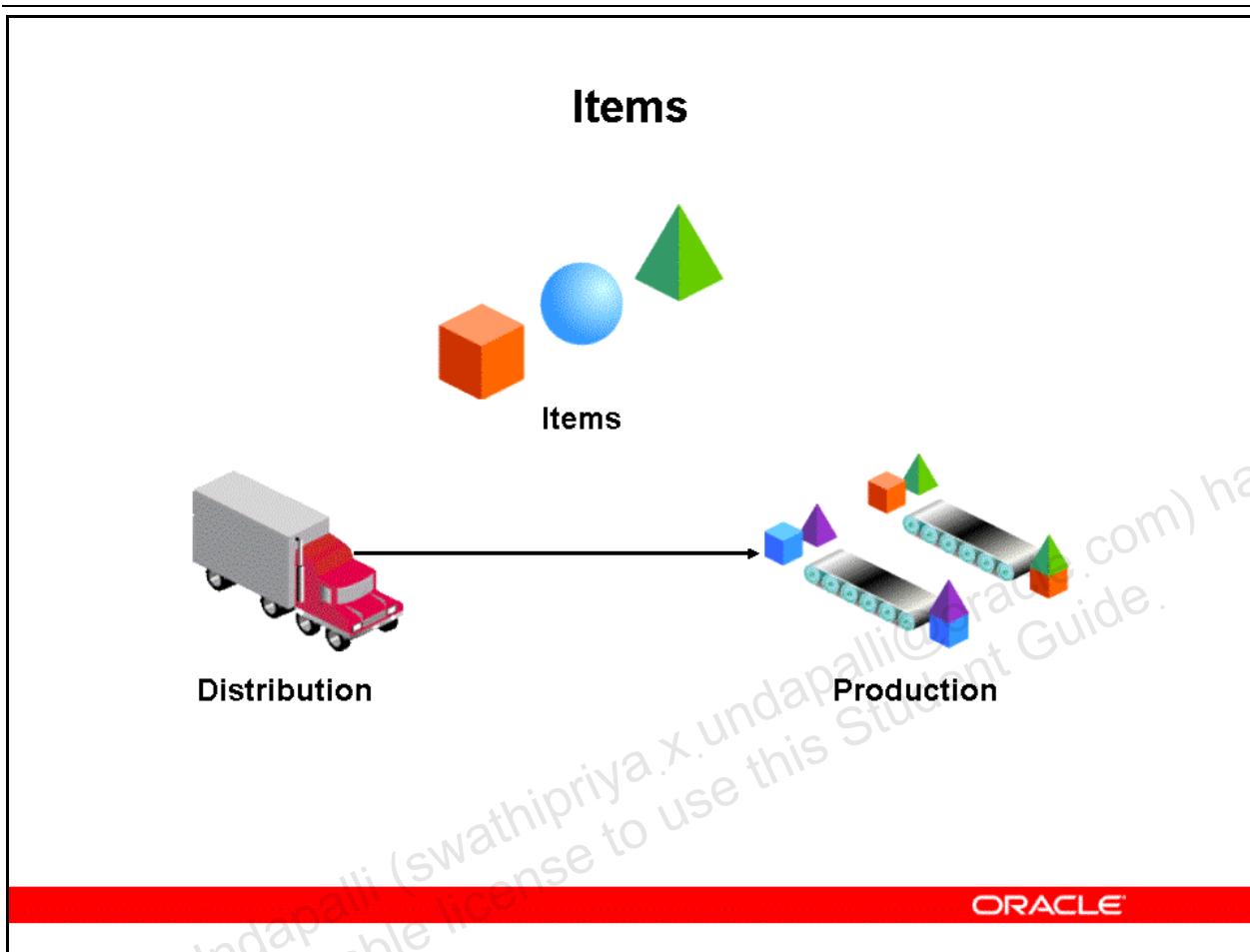
- **Items**
- **Item attributes**
- **Organization item**
- **Order modifiers**
- **Item attribute mass maintenance**

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#### Item Topics

This slide lists topics covered in this section of the lesson.

## Items

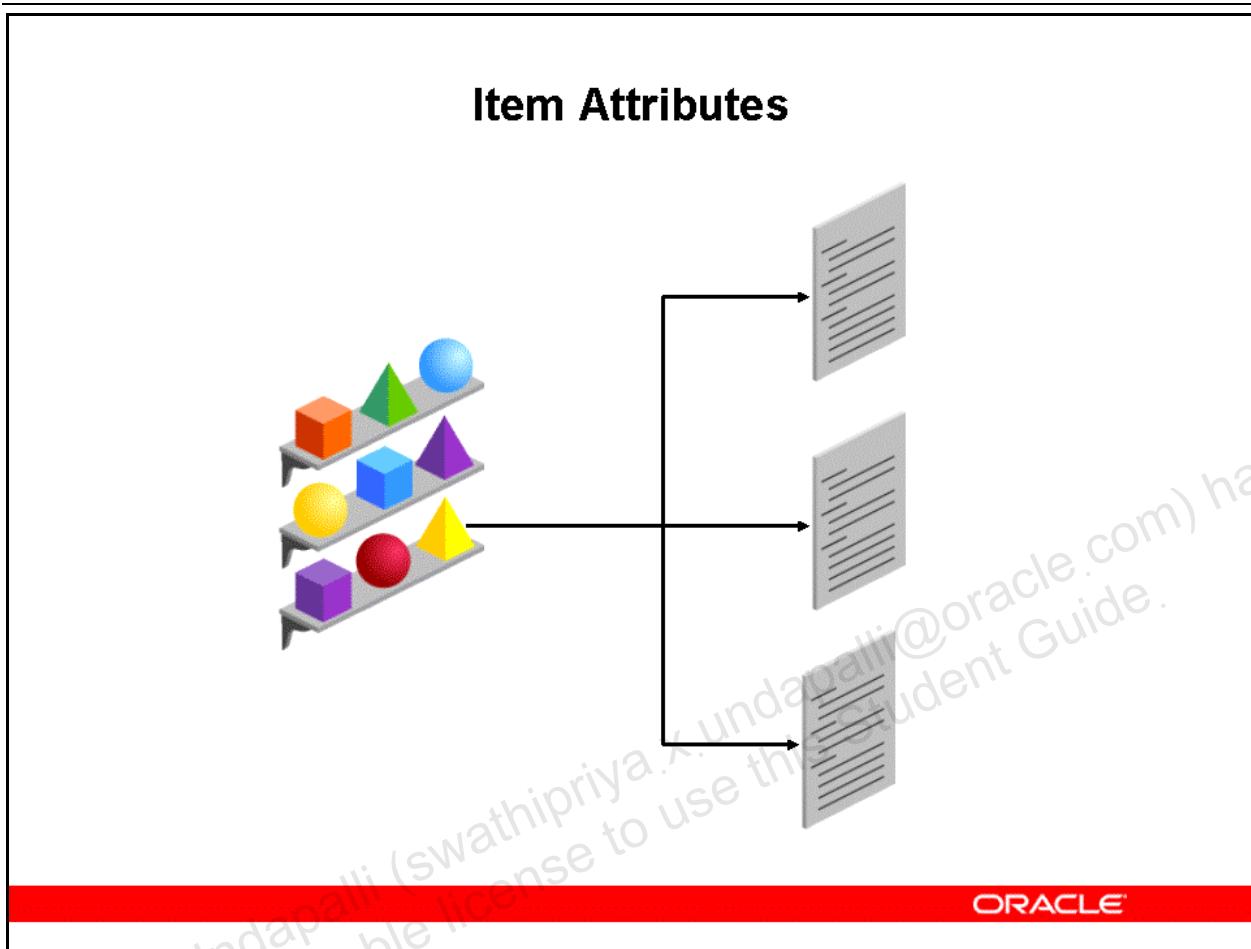


### Items

You use items to represent the material that you:

- Use in your manufacturing and distribution processes
- Store in inventory

## Item Attributes



### Item Attributes

Each item has over two hundred item attributes. Item attributes specify properties of each item. The planning engine takes instruction from many of these item attributes to do its work.

Oracle Inventory organizes the item attributes into groups. The planning engine consults item attributes in the following item attribute groups:

- Main
- Inventory
- Bills of Material
- Purchasing
- Physical Attributes
- General Planning
- MPS/MRP Planning
- Lead Times
- Work in Process
- Order Management

## Item Attributes for Planning

### Item Attributes for Planning

- **Main Tab**
  - Unit of Measure
- **Inventory Tab**
  - Inventory Item
  - Stockable
  - Transactable
- **Bills of Material Tab**
  - BOM Allowed
  - BOM Item Type
- **Purchasing Tab**
  - Purchasable
  - Use Approved Supplier
- **Physical Attributes**
  - Weights and measures
- **Work In Process Tab**
  - Build in WIP checkbox
  - Supply Type
- **Order Management**
  - Customer Orders Enabled
  - Internal Orders Enabled
  - Check ATP

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### Finding Specific Item Attributes

The slide lists several item attributes that are important to planning. To find an item attribute, use the Manufacturing and Distribution Manager to navigate to the Find Attributes window.

(N) Inventory > Items > Master Items (M) Tools > Find Attribute (B) OK

Type the first few letters of the item attribute label. Select the attribute from the short list. Click the Ok button. The Item Master window will open to the tab that contains the found item attribute, and the item attribute field will be highlighted.

## Item Attributes for Planning

### Item Attributes for Planning

#### General Planning Tab:

- **Make or Buy**
- **Safety Stock Method**
- **Order modifiers (lot-sizing rules)**
- **Planner Code**

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#### Item Attribute Tabs for Planning: General Planning

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

Information on the General Planning tab is dedicated to planning.

Make or Buy determines whether the item is manufactured internally or purchased.

Safety Stock Method is directs safety stock calculation method when Inventory Optimization is not used.

MRP order modifiers are specified on the General Planning tab of the Item Master window. Order modifiers adjust order quantities or combine orders. Examples of order modifier behavior are shown on the next pages.

Planner Code is important for filtering items in Planner Workbench and for releasing recommendations (the planning engine uses it to validate the buyer).

#### Note

- It is possible to set up conflicting order multipliers.
- Planning is done at the organization level. Therefore planning ignores subinventory parameters.

## Item Attributes for Planning

### Item Attributes for Planning

- **MPS/MRP Planning Tab**
  - **Planning Method**
  - **Forecast Control**
  - **Pegging**
  - **Exception Set**
  - **Time Fences**

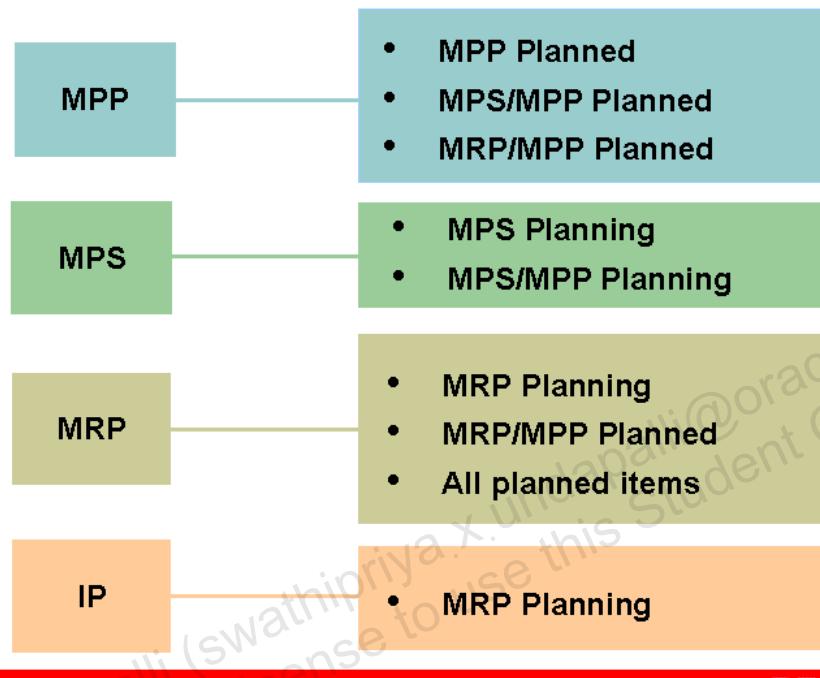
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#### Item Attribute Tabs for Planning: MPS/MRP Planning

Information on the MPS/MRP tab is dedicated to advanced planning.

## Plan Type and Planning Method Attribute

### Plan Type and Planning Method Attribute



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### Planning Method

Item attribute Planning Method specifies the plan type that is used to plan the item. When an item is not planned, it is not included in ASCP or Inventory Optimization calculations.

The choices are:

- Not planned
- MRP planning
- MPS planning
- MRP/MPP planned
- MPS/MPP planned
- MPP planned

### Plan Types

Plan types carry over from the Oracle Supply Chain Planning product to Oracle ASCP. There are three types of planning: MPP, MPS, and MRP. (Note: MRP is also used for IP.) The plan type is determined by which Names window you use to create the plan name.

Master production plans (MPP) consider the following items:

- MPP planned items
- MPS/MPP planned items
- MRP/MPP planned items

Master production schedules (MPS) consider the following items:

- MPS planning items
- MPS/MPP planning items

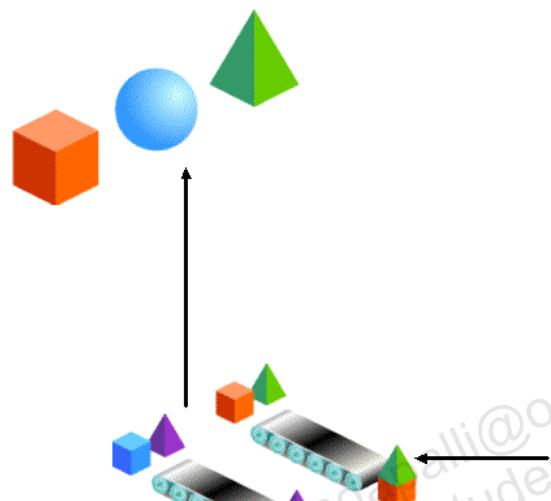
Material requirements plans (MRP) consider the following items:

- MRP planning items
- MRP/MPP planned items
- All planned items

Inventory plans (IP) consider only MRP planning items. This plan type is available only with the Inventory Optimization option (IO).

## Critical Components

### Critical Components



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### Critical Components

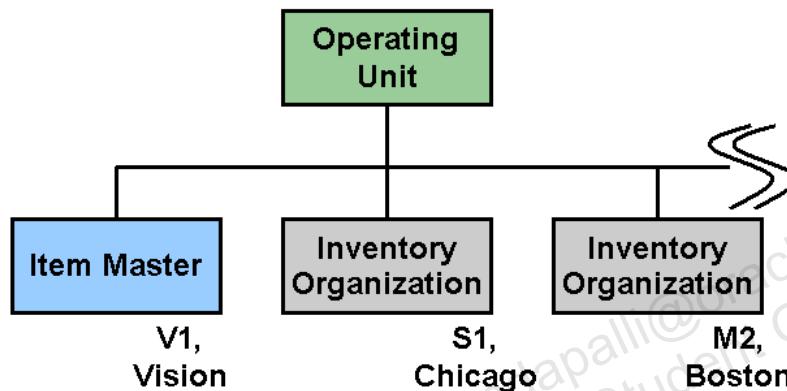
A critical component is a component that is:

- **Crucial to your production operation:** To mark an item as a critical component, select its item attribute Critical Component.
- **Produced using a bottleneck resource:** For example, sub-assembly B is created using an item A. You may not specify the item A as a critical component. However, if the resource for creating the sub-assembly B is a bottleneck, the planning engine considers (infers) the sub-assembly as a critical component at the time of planning for Item A in a production plan.

Select plan option Include Critical Components to instruct the planning engine to plan considering critical components. Depending on the plan type and the planning item types, the planning engine may plan critical components and not plan other components or components of those components.

## Organization Item

### Organization Item



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#### Organization Items

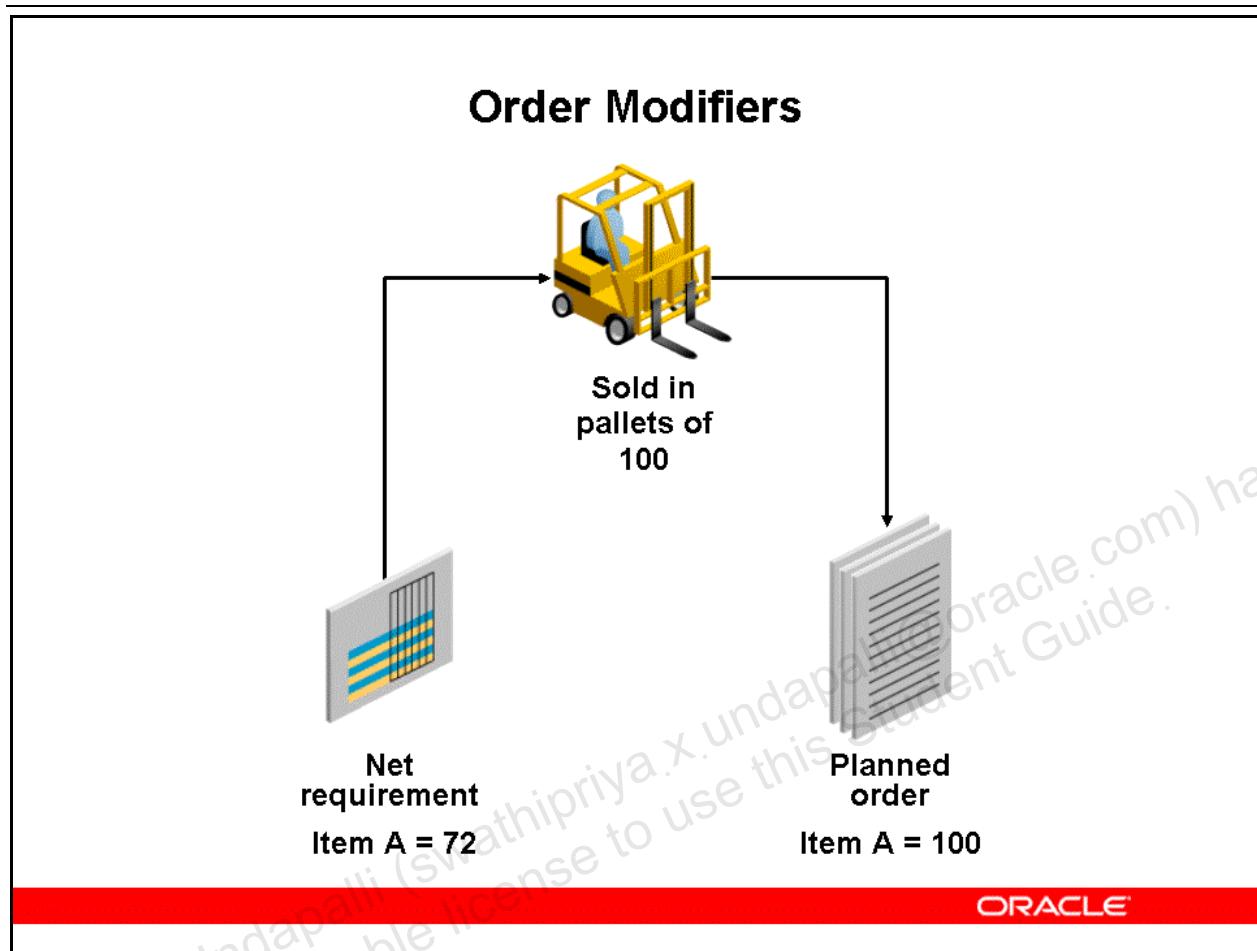
You create items first in a master organization and then enable them in the production and distribution organizations that use them.

You set some item attributes at the master organization level and they apply to the item in all organizations that use it (in which you enable the item). For other item attributes, you can set them at the master organization level but can set different values for them at each organization in which you enable the item.

You can cross operating units to establish the link between the inventory organizations and the master inventory organization.

Oracle recommends that you have only one item master organization.

## Order Modifiers



### Order Modifiers

With no extraordinary information, the planning process creates planned orders with quantities that equal the remaining net requirements (lot-for-lot). Order modifiers are item attributes that you can set that may cause a planned order quantity that is different from the remaining net requirements (lot sizing). They do not apply to items with WIP Supply Type of Phantom.

You use order modifiers to obtain planned orders that you are more likely to use in your environment. For example, you may purchase an item from a vendor who only provides it on pallets of quantity 100. If you are short 72, having the planned order quantity set to 100 instead of 72 supports this need.

Oracle material planning uses a priority sequence (precedence) of order modifiers. It applies certain order modifiers before others and rules out certain order modifiers based on its using certain other order modifiers. The order modifier precedence is:

- **Fixed days supply:** One planned order for this item must cover all the shortages for the number of days specified in the value. For example, if the net requirements are 50 on Monday, 100 on Wednesday, 70 on Thursday and you have set fixed days supply to five, the planning process will create one planned order, with quantity of 220 ( $50 + 100 + 70$ ) and due on Monday. The period start dates are not fixed; in the example, the next period of five days would not always start on the following Monday but would start on the next

day after Friday that has net requirements. Therefore, the next period of five days could be the following Wednesday through the second Tuesday.

- **Fixed order quantity:** The planned order quantity must always be this value. For example, if the net requirements are 1 and you have set fixed order quantity to 200, the planning process will create one planned order with quantity of 200. If set, the planning process skips to the modifier Round order quantities.
- **Fixed lot multiple:** The planned order quantity must always be a multiple of this value. For example, if the net requirements are 400 and you have set fixed lot multiple to 150, the planning process will create one planned order with quantity of 450.
- **Minimum order quantity:** The planned order quantity may never be less than this value. For example, if the net requirements are 100 and you have set minimum order quantity to 150, the planning process will create one planned order with quantity of 150. If set, the planning process skips to the modifier Round order quantities.
- **Maximum order quantity:** One planned order for this item may not have a quantity more than this value. For example, if the net requirements are 200 and you have set maximum order quantity to 150, the planning process will create two planned orders, one with quantity of 150 and the other with quantity of 50.
- **Round order quantities:** The planned order quantity must always be a whole number; the planning process always rounds fractional quantities up to the next highest whole number. For example, if the net requirements are 99.2 and you have selected round order quantities, the planning process will create one planned order with quantity of 100.

## Item Attribute Mass Maintenance

### Item Attribute Mass Maintenance

**Planning item attribute values can be modified in the planning server.**

- Use query criteria to select the items for which planning attributes need to be updated.
- Selectively update one or more of the item planning attributes.
- Create multiple versions of item attributes for simulation purposes.
  - Group and save item attribute **changes** as a **Simulation Set**.
  - Maintain **Simulation Sets** independently.
- Link a **Simulation Set** to a plan in the Plan Options.

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#### High level steps for creating simulation sets:

1. Identify the scenario to be simulated

**Example:** What if item processing Lead Time were to be decreased by 20% to reduce demand lateness

2. Determine the scope of the simulation

**Example:** Buy items with item Processing Lead Time greater than 10 days

3. Create a query to identify items that fit the scope

**Example:** Display all “buy” items (make or buy = buy) with processing time greater than 10 days. In other words the Processing Lead Time is greater than 10.

4. Identify attributes that need to be modified to meet the simulation objective

**Example:** Processing Lead Time

5. Modify the attributes according to the scenario to be simulated

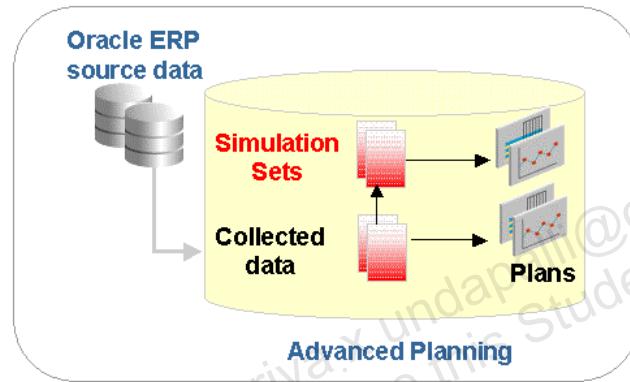
**Example:** Decrease Processing Lead Time by 20%

## Item Attribute Mass Maintenance

### Item Attribute Mass Maintenance

The Simulation Set only holds the *changes* for the collected planning item attributes.

- When running a plan, these changes overwrite the collected data values *for that specific simulation plan*.



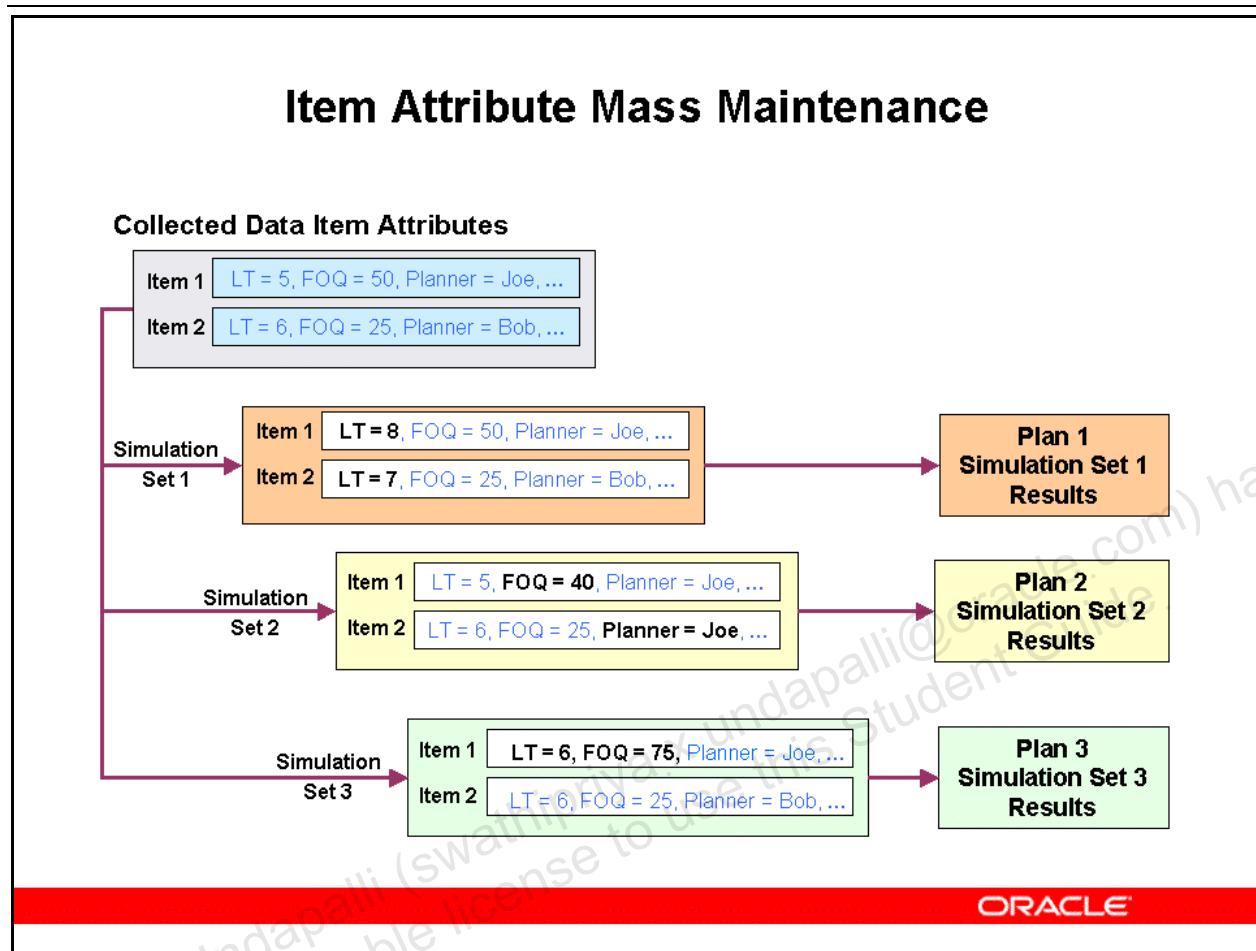
- Note: The collected data itself does not change. Update the source data if a permanent change is required.

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#### Changes overwrite collected data for a specific plan.

If there is no simulation set linked with the plan, the plan will be run against the collected data.

## Item Attribute Mass Maintenance



#### Note

- Collected data remains unaltered.
- Multiple items and attributes can be modified in one simulation set.
- A Plan can be linked to a simulation set.
- The planning system uses the changed values from the simulation sets to calculate simulation plans accordingly.

## Item Attribute Mass Maintenance

### Item Attribute Mass Maintenance

- Use the “Query” feature to retrieve items for updates:
  - Query and display the items included or not included in the simulation set.
  - Base the Query on original values or updated values.
  - Save the Query as a folder for later retrieval.
- Use the “Select all” feature to select all displayed records for mass updates.
- Modify the values of attributes:
  - Directly set a new value.
  - Increase and decrease original values.
  - Restore original values.

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#### Queries

Users can query:

- All or subset of Items that are already updated in the simulation set
- All or subset of Items that are not updated in the simulation set
- All or subset of items regardless of the update status in the simulation set

## Item Attribute Mass Maintenance Benefits

### Item Attribute Mass Maintenance Benefits

- Improve simulation capability.
  - Modify item attributes to perform what-if analysis.
  - Multiple simulation scenarios can be created, each with its own set of item attributes.
- Reduce Planning cycle time.
  - Rapidly correct or change item attributes without re-collecting data.
- Update planning specific attributes that are not available in ERP such as:
  - Minimum Remaining Shelf Life (Days)

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#### Benefits

- The simulation set is not plan specific, and hence is available for all the plans.
- The changes made in the simulation set are available in the planning server only. They are not available in the execution system.

## Item Attributes Supported for All ASCP Plans

### Item Attributes Supported for All ASCP Plans

- Critical Component
- Preprocessing Lead Time
- Processing Lead Time
- Post processing Lead Time
- Fixed Lead Time
- Variable Lead Time
- Fixed Order Quantity
- Fixed Days Supply
- Shrinkage Rate
- Fixed Lot Multiple
- Minimum Order Quantity
- Maximum Order Quantity
- Service Level
- Carrying Cost
- Demand Time Fence Days
- Forecast Control
- Planning Time Fence Days
- Standard Cost
- Net Selling Price
- PIP Flag
- Selling Price
- Substitution Window
- Safety Stock Days
- Unit Weight
- Unit Volume
- Safety Stock Method
- Safety Stock Percent
- ABC Class
- Planning Method
- Minimum Remaining Shelf Life

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### Supported Item Attributes

The attributes that can be modified in the planning server are limited to the planning related item attributes that are collected.

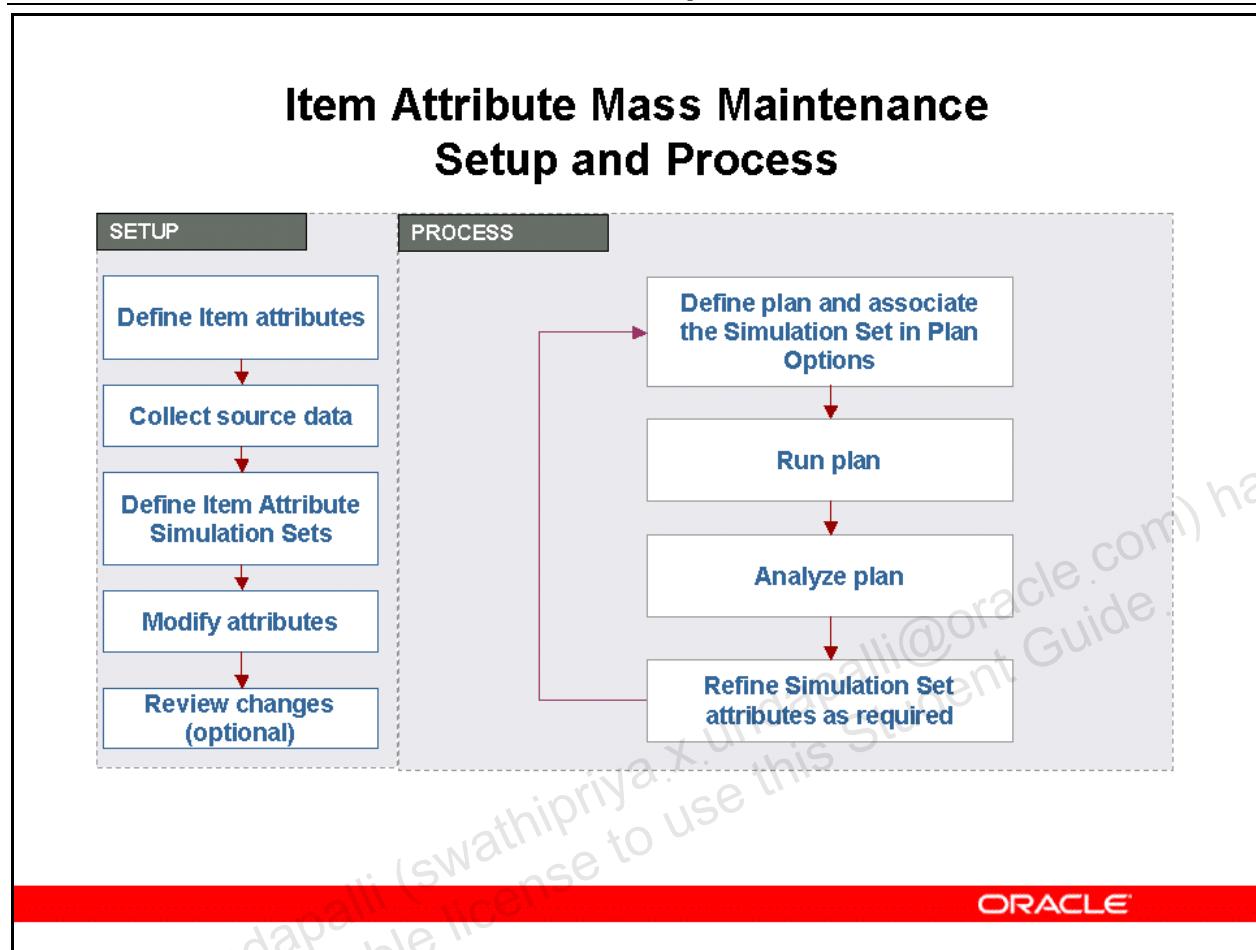
## Item Attributes Supported for DRP Plans Only

### Item Attributes Supported for DRP Plans Only

- DRP Planned
- Max Inventory Days of Supply
- Max Inventory Window
- Target Inventory Days of Supply
- Target Inventory Window

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## Item Attribute Mass Maintenance Setup and Process



### Setup

Item attributes are defined in the ERP system, and then collected for use in generating plans. This feature enables the planner to define named Item Attribute Simulation Sets. Within a given Item Attribute Simulation Set, the planner can change one or more item attribute values.

### Process

To perform what if analysis, a plan is defined. A simulation set is associated with the plan in Plan Options. After generating the plan and analyzing the result, the planner can accept and implement the result, revise the attribute values in the simulation set, or create a different simulation set and associate that set to another generation of the plan.

## Quiz

### Quiz

**Order modifiers may cause a planned order quantity that is different from the remaining net requirements**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Quiz

### Quiz

**Where do you modify planning item attribute values?**

- 1. Plan options**
- 2. Planning server**
- 3. Order modifiers**
- 4. Bill of materials**

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**Answer:** 2. Planning server

## Quiz

### Quiz

**Before you run a plan, you must define the plan and associate it with a Simulation Set in Plan Options.**

- 1. True**
- 2. False**

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**Answer:** 1. True

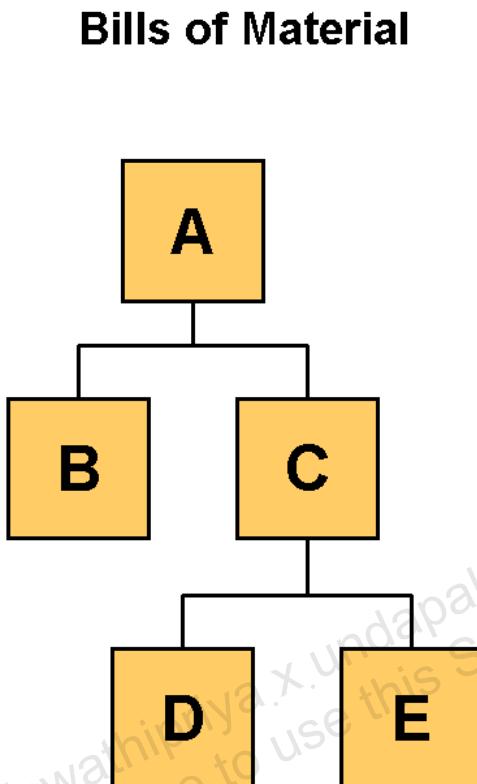
## Topic Overview: Material

### Topic Overview: Material

- **Bills of material**
- **Indented bills of material**
- **Alternate bills of material**

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## Bills of Material



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### Bills of Material

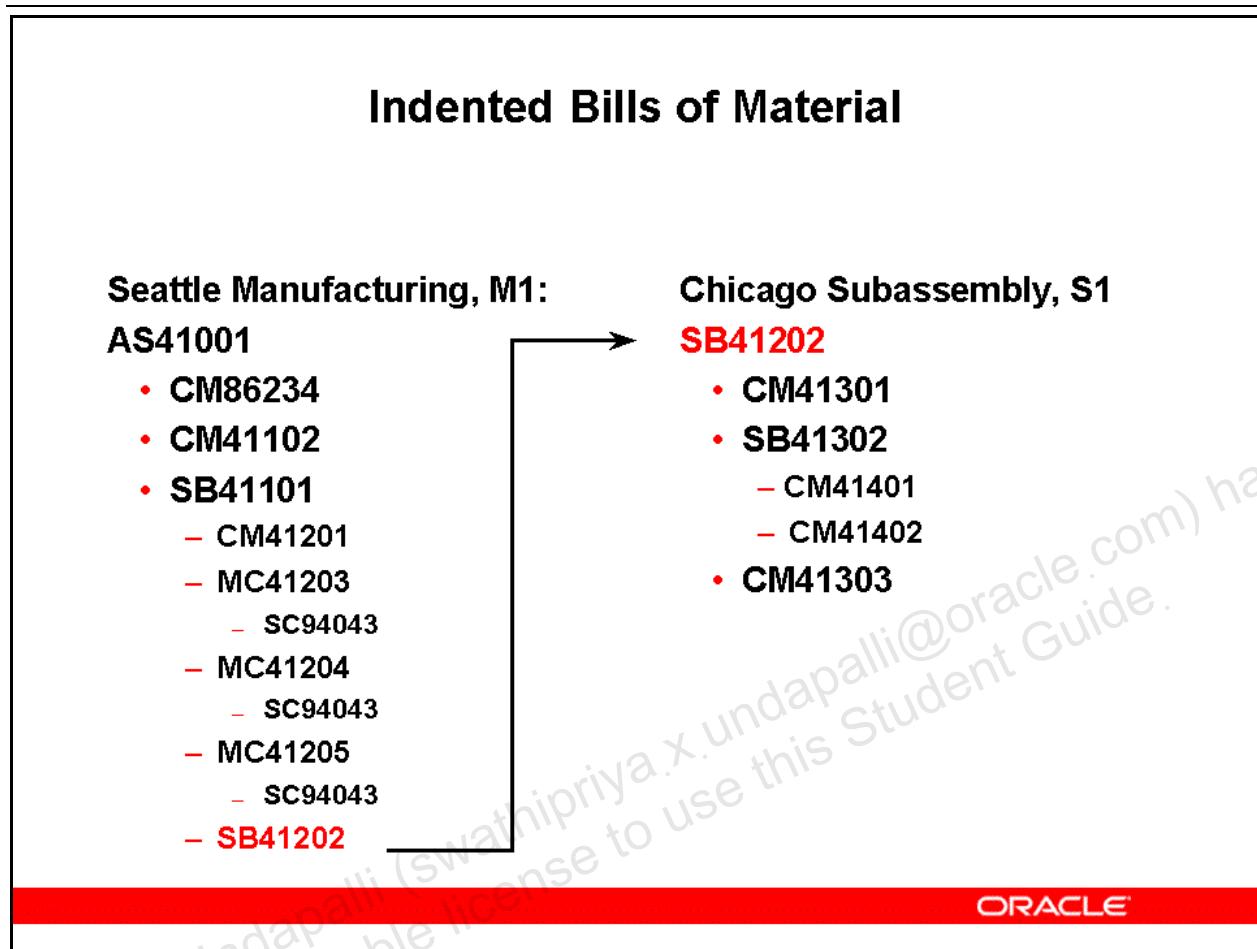
You use bills of material to specify the component items that you use to:

- Manufacture assemblies and subassemblies
- Configure sales orders
- Explode aggregate forecasts
- Calculate costs

These are the major fields that affect planning:

- Revision
- Item Seq
- Op Seq
- Quantity
- From
- Supply Type
- Yield
- Enforce Integer Quantity

## Indented Bills of Material



## Indented Bills of Material

You can view multilevel bills of material in an indented format. Each level of indentation indicates a single level, parent-and-component relationship.

An indented bill of material for end item AS41001, viewed from the Seattle Manufacturing organization is shown at the left. Components of the subassembly SB41202 are not visible in this indented bill.

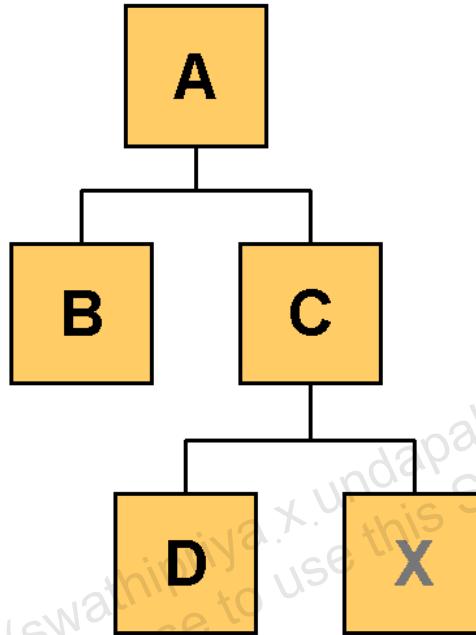
An indented bill of material for subassembly SB41202, viewed from the Chicago Subassembly organization is shown at the right. Parents of the subassembly SB41202 are not visible in this indented bill.

The two organizations are linked by a sourcing rule that specifies that Seattle Manufacturing obtains SB41202 from Chicago Subassembly.

Oracle Advanced Supply Chain Planning provides a view of the entire bill of material (supply chain planning bill of material).

## Alternate Bills of Material

### Alternate Bills of Material



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### Alternate Bills of Material

Use alternate bills of material to specify an alternate list of components that you can use to make the same product.

Decision rule plans and optimized plans use alternate bills of material.

## Quiz

### Quiz

**Each level of indentation in a Bill of Materials indicates a relationship between suppliers and manufacturers.**

- 1. True**
- 2. False**

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**Answer:** 2. False: Each level of indentation indicates a single level, parent-and-component relationship.

## Topic Overview: Resource I

### Topic Overview: Resource I

- **Workday calendar, work patterns, and shifts**
- **Defining work hours for a work shift**
- **Departments and resources**
- **Routings**
- **Modeling resource constraints**
- **Non critical patch resources**
- **Sequential resources**
- **Overlapping resources**
- **Simultaneous resources**

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## Topic Overview: Resource II

### Topic Overview: Resource II

- **Alternate resources**
- **Scheduling time window width for alternate resource**
- **Resource selection dependency**
- **Multiple resource scheduling**
- **One resource to one unit at a time**
- **Batch resources**
- **Minimum transfer quantity**
- **Modeling production resource capacity**
- **Multiresource scheduling**

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## Workday Calendar, Work Patterns, and Shifts

### Workday Calendar, Work Patterns, and Shifts



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### Workday Calendar, Work Patterns, and Shifts

#### Workday Calendar

Material planning uses the workday calendar to determine the days that the plant works. Job and schedule start dates, job and schedule completion dates, and lead time offset days can be only workdays.

#### Work Patterns

Work patterns in the workday calendar show the days that the facility operates.

#### Shifts

Shifts in the workday calendar show the times that workers can work. You assign shifts to resources.

## Defining Work Hours for a Work Shift

### Defining Work Hours for a Work Shift

- Define work calendar
- Attach work calendar to organization
- Define shift name, attached to calendar
- Define workday pattern for the shift name
- Define work shift hours for the shift name

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### Defining Work Hours for a Work Shift

After you add a shift to a calendar, rebuild the calendar to enable the shift.

(N) Bills of Material > Setup > Calendars

(M) Tools > Build

To reflect changes in a plan resulting from adding or changing a shift, rerun the plan.

## Departments and Resources

### Departments and Resources

- **Define resources**
- **Define departments**
- **Assign resources to departments**

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## Departments and Resources

### Resources

Resources are anything, except component material, that you use or need in manufacturing a product. You:

- Identify resources
- Associate them with departments
- State their work shifts
- Insert them into the routings

Once in the routings, the resources are used for setting item standard costs, scheduling discrete jobs, and planning capacity.

The planning engine plans capacity based on the assigned units of a resource for each shift (shift-specific resource capacity).

### Alternate Resources

Use alternate resources to specify an resources that you can use in place of other resources. You specify alternate resources in routings.

## **Departments and Department Classes**

A department is a collection of resources designed to do certain tasks. For example, you might group the drill presses and machinists into a department. Departments are also called work centers.

A department class is a collection of departments. For example, you might group the welding, machining, plating, and painting departments into the manufacturing department class, and you might group the unit test and final test departments into the quality department class.

## **Resources, Departments, and Shifts**

You must assign a resource to one department, and you may share that resource with other departments.

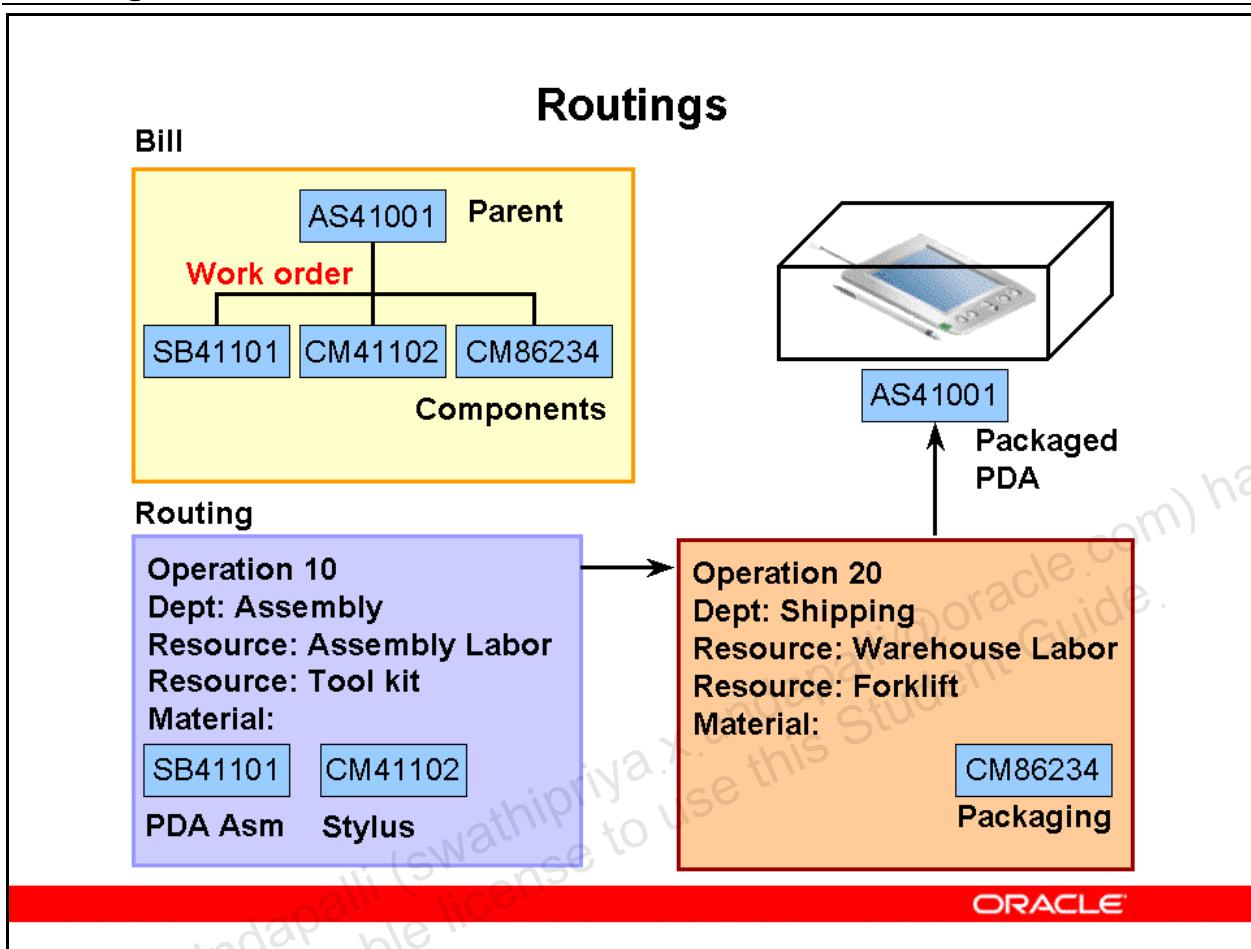
A shift represents a period of time during which a resource is available for work. You specify the times for your shifts in the workday calendar. When you assign the resource to its department, you specify the shifts that the resource works.

## **Department Resources**

You define resources, associate resources with departments, and attach work shifts to define the time that the resource is available.

**Note:** When no Exception Set is assigned, on the Resources - <Department> window, no planning capacity exception messages will be generated for that department resource.

## Routings



## Routings

You use routings to specify the process that you use to manufacture assemblies and subassemblies. A routing consists of operation steps. Each operation step occurs at a department and contains resources that perform a specified amount of work.

These are the major operation fields that the planning engine consults:

- Revision
- Seq
- Department
- Effectivity Date

These are the major operation resource fields that the planning engine consults:

- Seq
- Resource
- Rate or Amount Usage
- Schedule
- Principal Flag

You can link materials to specific operation steps. For example, warranty literature and packaging material can be linked to a late operation step, such as packing for shipment. This functionality can be useful when the completing a routing requires a long time and you do not want costly items to arrive early, occupy floor space, and possibly be damaged while waiting to be assembled into the product.

ASCP considers costs and workloads while evaluating alternate routings. When a work order is released to the shop floor, the selected routing is attached to specify the actual sequence of operation steps that should be used to complete that specific work order.

## Modeling Resource Constraints

# Modeling Resource Constraints

### Operation Resource Schedule:

- Yes
- No
- Prior
- Next

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## Modeling Resource Constraints

The manufacturing process or routing to make a product lists the operations that are required to be performed in a predetermined sequence. Resources consumed to complete these operations need to be scheduled.

### Operation Resource Schedule Flag

The schedule flag determines whether a resource is scheduled. When the schedule flag has been set to Yes, Prior, or Next, the corresponding operation resources are brought over to the planning server as a part of the routings collection. When the schedule flag has been set to No, the corresponding operation resource is not brought over to the planning server as a part of the routings and is not scheduled.

To set the Operation Resource Schedule flag, use the Manufacturing and Distribution Manager responsibility to navigate to the Scheduling tab of the Operations Resources window:

(N) Bills of Material > Routings > Routings (B) Operations Resources (T) Scheduling

## Non Critical Path Resources

### Non Critical Path Resources

- **Machine paced operation:**
  - **Drill: Schedule = Yes**
  - **Machinist: Schedule = No**
- **Only the machine time is scheduled**

Drill

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### Non Critical Path Resources

The processing time for an operation duration is often determined by a pacing resource, which is usually a machine. In this case, for scheduling purposes, only the pacing resource needs to be modeled.

## Sequential Resources

### Sequential Resources

- **Operation 10: Finishing**
  - **Sander, Schedule = Yes**
  - **Paint sprayer, Schedule = Yes**
- **Usage time is scheduled consecutively**



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### Sequential Resources

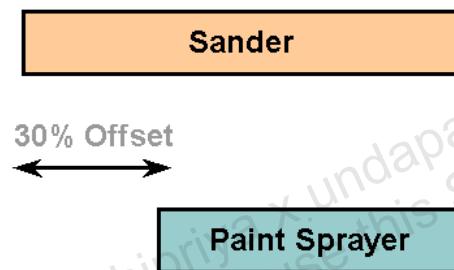
When more than one resource is used sequentially within the same operation, set the Operation Resource Schedule values to yes for each of the sequential resources.

Use the sequence number to indicate the scheduling order.

## Overlapping Resources

### Overlapping Resources

- **Operation 10: Finishing**
  - **Sander: Schedule = Yes**
  - **Paint Sprayer: Schedule = Prior Offset 30%**
- **Resources are consumed during an overlapping time period.**



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### Overlapping Resources

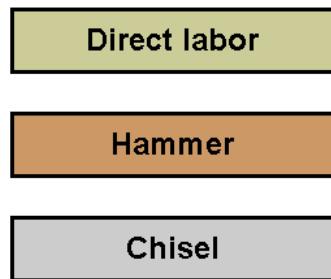
When the work order lot size is large, it is often possible for a subsequent process to begin work before the first process is completed.

Use the Next and Prior settings of the Operation Resource Scheduling flag to indicate that the resource time should overlap with the next or previous operation. The Offset % field works with the Operation Resource Scheduling flag to specify the lead time offset (in percent). In this example, when the start time for the second process is planned to occur when the prior process is 30% completed.

## Simultaneous Resources

### Simultaneous Resources

- **Resources are scheduled for the same time period**
- **Primary resource group:**



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### Simultaneous Resources

You can schedule two or more resources (simultaneous resources) to be used at the same time within the job operation. For example: you can schedule a person resource and a machine resource to work at the same time.

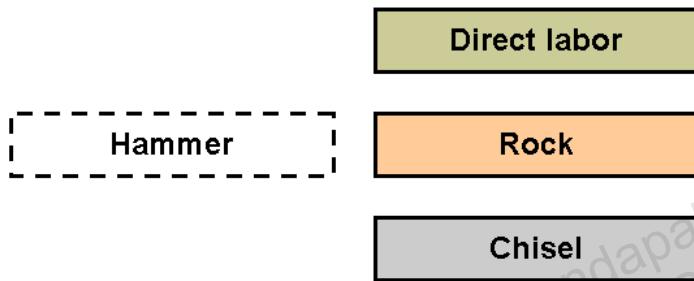
You can define resource groups within an operation. This step assigns a group number to the primary resource.

For each numbered primary resource group, you can define substitute resources. This enables you to specify resource sequences that can replace the primary resource group. For example: a group of lathes can be replaced by a group of computer numerical control (CNC) machines. You can assign a priority to the substitute resource groups, and specify under what circumstances the substitute groups are to be considered.

## Alternate Resources

### Alternate Resources

#### Replacement resource group



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#### Alternate Resources

Use the Manufacturing and Distribution Manager responsibility to navigate to the Routings window

(N) Bills of Material > Routings > Routings (T) Main

From the Main tab, select the operation sequence within which you want to set up alternate resources.

Select the Operation Resources Button. The Operation Resource window appears with the first resource already entered. This resource is considered as a primary resource.

Select the Scheduling Tab. Enter a Schedule Sequence number so that the Alternate button is enabled. The Schedule sequence number is used to tie resources together to establish the alternate relationship. Check the Principal Flag for the resource.

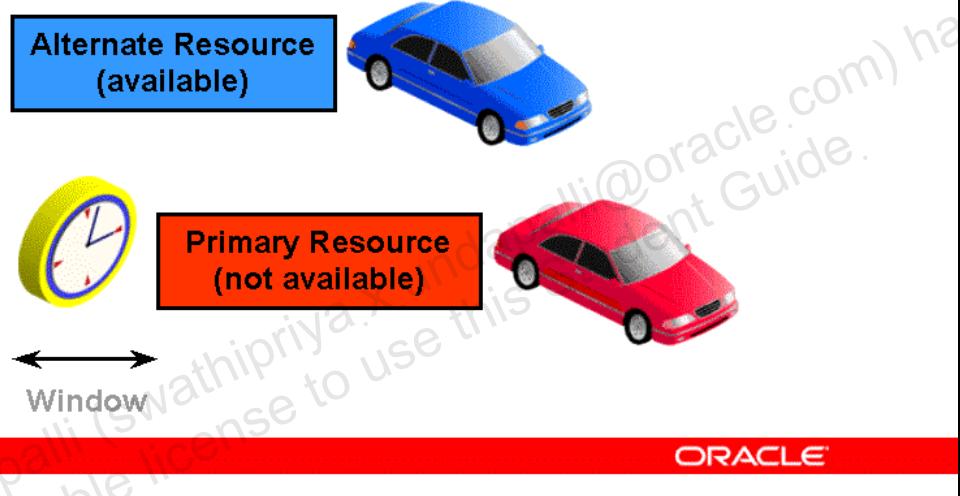
Select Alternate Button. The BOM Alternate Resource window appears.

Enter the alternate resource and choose Replacement Group #. Replacement Group number establishes relative priority. Enter a value of 1 or higher. If you have multiple alternates, enter them as multiple rows with appropriate Replacement Group #'s to indicate priorities. Check the Principle Flag for your alternate resource.

## Scheduling Time Window Width for Alternate Resource

### Scheduling Time Window Width for Alternate Resource

- **MSO: Schedule Window Width**
- **Time period that you are willing to wait for the primary resource to become available**



### Scheduling Time Window Width for Alternate Resource

The profile MSO: Schedule Window Width is used to control the selection of primary and alternate resources. This profile tells the scheduling engine to wait a certain amount of time to see if a primary resource will become available before employing an alternate resource.

The Schedule Window Width is specified in days (includes non-working days), and represents the time between the alternate and primary resource availability. The window starts at the first availability of alternate resources and ends based on the window width specified in the profile option. The scheduling logic selects the highest priority resource that is available within the window.

Therefore,

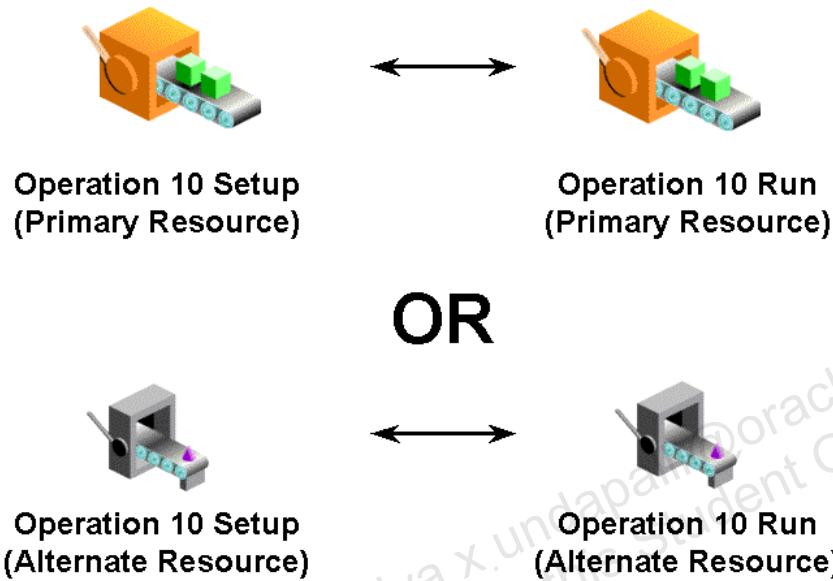
- If both primary and alternate resources are available within the window, the primary is selected
- If only the alternate resource is available within the window, the alternate is selected.

Oracle ASCP issues exception messages if it:

- Overloads capacity
- Uses alternate resources

## Resource Selection Dependency

### Resource Selection Dependency



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### Resource Selection Dependency

ASCP considers resource selection dependencies when planning. It often makes sense to have all of the activities for a single operation all occur on the same machine (resource)..

For example:

- You have an operation with setup, run, and teardown activities.
- If the planning engine selects an alternate resource for run, it makes sense for it to schedule the setup and teardown on the same alternate resource
- To ensure this, on the routing enter the same Activity Sequence ID on the alternates for setup, run, and teardown and assign Group Number.

Only resources within the same operation sequence can be designated in this way. You cannot set this up between resources across operation sequences.

## Multiple Resource Scheduling

### Multiple Resource Scheduling

**Task duration inversely proportional to number of resources applied**

- **Assigned units**
- **Maximum available resource units**

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### Multiple Resource Scheduling

For some manufacturing operations, the duration can be shortened by applying greater numbers of processing resources. For example, the duration of a visual inspection operation can be approximately halved by increasing the number of inspectors from one to two. You can accurately plan for decreasing operation duration as greater numbers of processing resources are deployed. You can designate certain operations as divisible and others as indivisible (See next page, one resource per operation).

Since Oracle ASCP treats the capacity of multiple units of a single resource as a large bucket (instead of as independent buckets for each resource unit), certain detailed scheduling decisions will be approximate and may not be locally optimal.

Use profile option MSO: Use of Assigned Units in Scheduling to instruct the planning engine whether to dynamically choose the number of resource units to perform an activity or to use only the assigned units specified on the routing.

## One Resource to One Unit at a Time

### One Resource to One Unit at a Time

**Round Order Quantities checkbox = selected:**

- Operation can not work on a fractional unit
- Operation time can not be reduced by increasing the number of resources applied

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### One Resource to One Unit at a Time

Use the Manufacturing and Distribution manager responsibility to navigate to the MPS/MRP Planning tab of the Master Item window.

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

Select the Round Order Quantities attribute in the item master to indicate that:

- An order should not be placed for a fractional unit
- Only one resource unit can work on this item at one time.

The Round Order Quantities attribute is used to indicate that one resource unit can work on one and exactly one assembly at a time is that the attribute is typically used when the unit of measure for an item is each, and when you would like to avoid building or buying fractional eaches. This is the same situation in which you would like to specify that a machine cannot work on say, half of an item.

When the Round Order Quantities attribute is not selected planning permits ordering and working on fractional items.

## Batch Resources

### Batch Resources

**Critical issues for scheduling batch operations are:**

- **Grouping items for scheduling**
- **Constraining resources along multiple dimensions**
- **Honoring minimum and maximum batch sizes**
- **Delaying or building in advance to make up a batch**

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## Batch Resources

Batch operations can process multiple items simultaneously. Typical examples of batch operations are heat treatment and electroplating. Work scheduled via batch processing is characterized by the same work performed on multiple items simultaneously for a pre-set amount of time. Some of the other characteristics of batch processes are commonality of processing requirements across items, multi-unit capacity available to hold the items, and minimum batch size considerations.

Oracle ASCP allows you to specify a resource as a batch type resource at the department resource level. A batch type resource is consumed only on a Lot basis. Oracle ASCP batches several orders for an item or across items when scheduling batch resources. Oracle ASCP batches operation sequences that carry the same batch resource and schedules them as a batch. The criteria for batching depends on the following factors:

- Sharing same standard operation code
- Same usage on the routing

If you do not assign a standard operation code to an operation sequence that uses a batch resource, Oracle ASCP only batches orders with matching durations.

## Batch Resources

### Batch Resources

- **Batching window**
- **Minimum and maximum batch capacity**
- **Batchable unit of measure**

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### Batch Resources

Oracle ASCP allows you to specify a window to batch orders. You can specify the window size at the department resource level. If the system does not find orders in the Batching window, which is equal to, or more than the minimum batch quantity, it starts a batch with less than minimum quantity. In this case, an exception message is generated.

**Minimum / Maximum Batch Capacity.** You can specify minimum and maximum batch quantities for batch type resources. The minimum batch size is implemented as a soft constraint. The maximum batch size is a hard constraint. Oracle ASCP continues to batch orders until the maximum batch size is met or until the Batching window is exceeded.

**Batchable Unit of Measure.** You can specify a unit of measure (volume or weight) at the resource level that is appropriate to your resource. In addition to the resource availability (time dimension), Oracle ASCP allows you to constrain a resource in one other dimension (batching dimensions are time, volume, and weight). The batching activity is constrained by the maximum capacity set for a resource.

**Setting Up Batch Resources.** Use the Manufacturing and Distribution Manager responsibility to navigate to the Departments window.

(N) Bills of Materials > Routings > Departments.

- Select the Department field and use the flashlight icon to select a Department.
- Select the Resources button. The Department Resources window appears.
- Select the Planning tab and open the flexfield. The Department Resource Information window appears. This window contains the setup parameters for a batchable resource.
- Specify a resource as a batch type resource at the department resource level by setting the Batchable Flag to Yes.
- Specify a window to batch orders.
- Specify minimum and maximum batch quantities for batch type resources.
- Specify a unit of measure (volume or weight) at the resource level.

## Minimum Transfer Quantity

### Minimum Transfer Quantity



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### Minimum Transfer Quantity

The Minimum Transfer Quantity (MTQ) is the completed quantity of an order from an upstream process that triggers the start of the next downstream process.

Minimum Transfer Quantity is used to model production operations in which materials are transferred in lots that are smaller than the work order lot size. This results in downstream operations that start before upstream operations are completely finished, and reduces total manufacturing lead time.

You can specify Minimum Transfer Quantities between successive operations of a routing or between routings (Intra-Routing and Inter-Routing). A downstream process can start after a minimum quantity of work from the upstream process has been completed.

Use the Manufacturing and Distribution Manager responsibility to navigate to the WIP tab of the Define Routings window.

(N) Bill of Materials > Routings > Routings (T) WIP

Specify Minimum Transfer Quantity in the Routing form.

- The inter-routing MTQ is specified for the last operation of the upstream routing.
- The intra-routing MTQ (between operations) is specified for the upstream operation.

## Modeling Production Resource Capacity

### Modeling Production Resource Capacity

- Define work time available
- Define production resources available
- Use efficiency and utilization factors to modify capacity

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### Modeling Production Resource Capacity

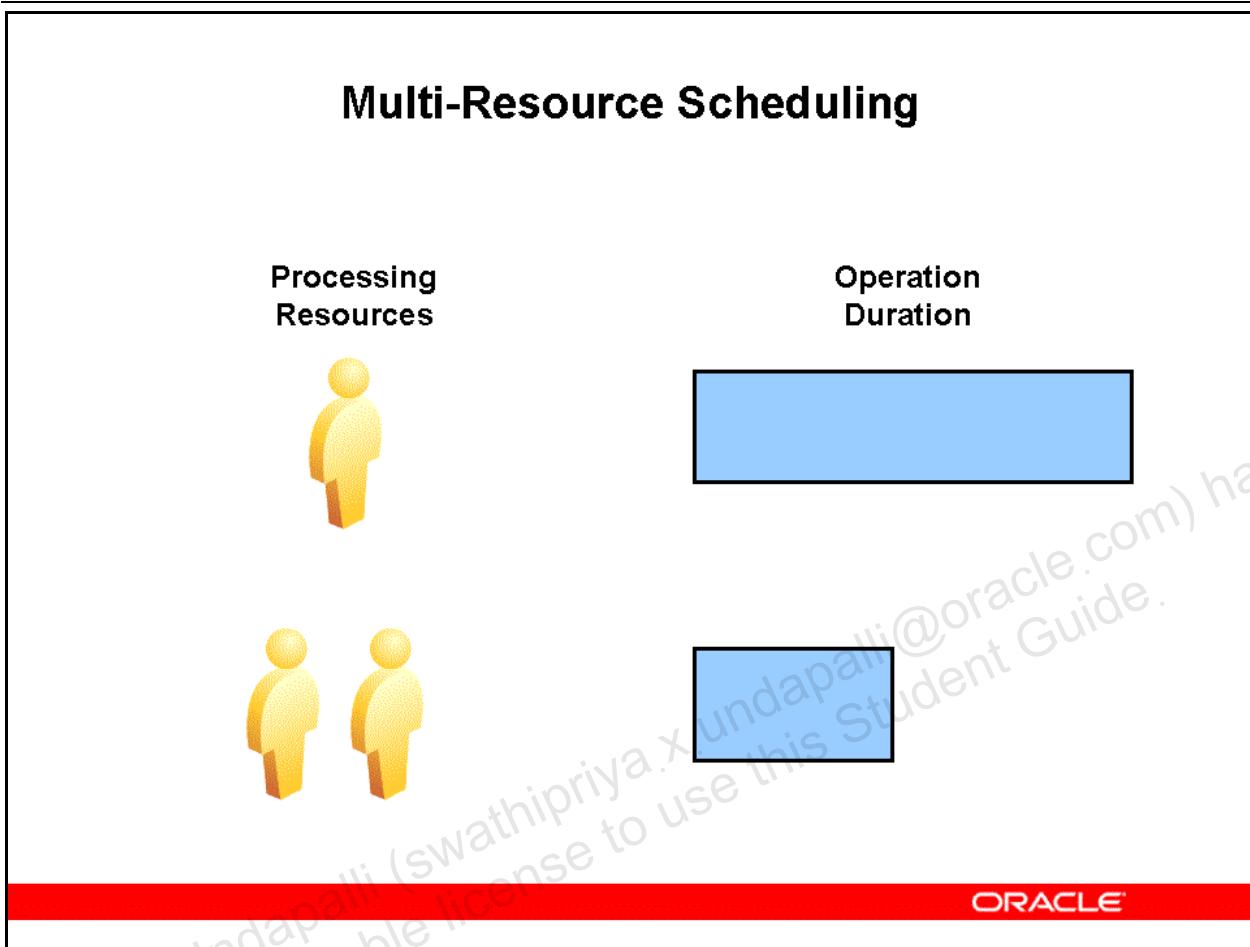
Advanced Supply Chain Planning uses information collected from the source instances to construct models of production capacity.

Department resource work shift hours, efficiency, and utilization factors from item routings are collected by ASCP. Efficiency measures how well something is performing relative to an existing standard. Utilization is a measure comparing actual time used to available time, as a percentage.

ASCP plans on the basis of actual usage in order to produce schedules that can be consistently implemented on the manufacturing floor.

$$\text{Actual Usage} = (\text{Theoretical Usage}) / \{(\text{Efficiency}) * (\text{Utilization})\}$$

## Multi-Resource Scheduling



### Multi-Resource Scheduling

For some types of manufacturing operations, the duration can be shortened by applying greater numbers of processing resources. For example, the duration of a visual inspection operation can be approximately halved by increasing the number of inspectors from one to two. For these types of divisible manufacturing operations, it is important to accurately plan for the shrinking of the operation duration as greater numbers of processing resources are deployed. It is also important to be able to designate certain operations as divisible and others as indivisible (one resource per operation).

You set this as a flag on the routing.

## Quiz

### Quiz

**Material planning uses this to determine the days that the plant works.**

- 1. Shifts**
- 2. Work patterns**
- 3. Workday calendar**
- 4. Routing**

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**Answer:** 3. Workday calendar

## Quiz

### Quiz

**Two or more resources that are scheduled to run at the same time are called:**

- 1. Batch Resources**
- 2. Alternate Resources**
- 3. Sequential Resources**
- 4. Simultaneous Resources**

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**Answer:** 4. Simultaneous Resources

## Quiz

### Quiz

**Minimum Transfer Quantity is the completed quantity of an order from an upstream process that triggers the start of the next downstream process.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Topic Overview: Sourcing I

### Topic Overview: Sourcing I

- **Modeling the supply chain**
- **Virtual enterprise structure**
- **Supply chain structure**
- **Modeling shipments between organizations**
- **Modeling shipments between organizations and external sites**
- **Supply chain links**
- **Sourcing rules**
- **Allocating demand to suppliers**
- **Sourcing splits**
- **Allocation rules**

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## Topic Overview: Sourcing II

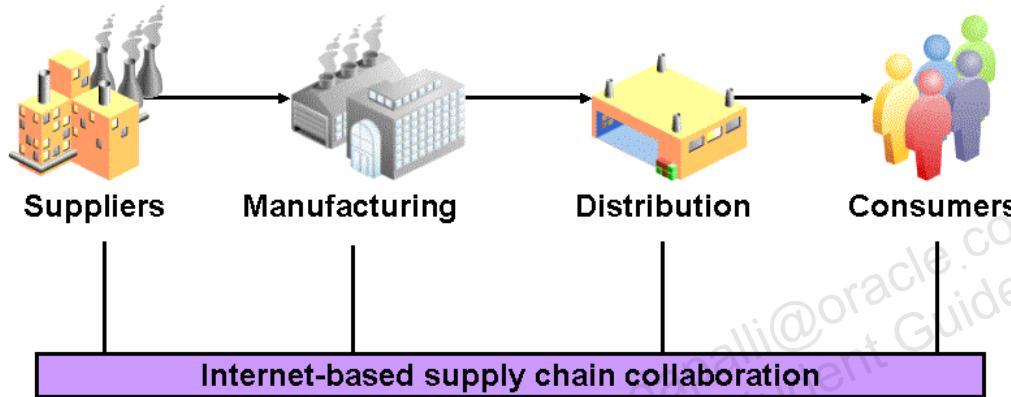
### Topic Overview: Sourcing II

- **Bills of distribution**
- **Assignment sets**
- **Sourcing assignment hierarchy**

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## Modeling the Supply Chain

### Modeling the Supply Chain



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### Modeling the Supply Chain

Before you generate production plans, you need to describe how you intend to obtain each of your material items. In other words, you need to specify which suppliers provide each purchased item, and which organizations supply each manufactured item. These specifications are called sourcing rules or bills of distribution.

If you have implemented Oracle supply chain manufacturing applications, release 11 or later, no additional supply chain set up is required before you can use ASCP to generate unconstrained or constraint-based plans.

**Note:** Optimization uses price and cost information. The current release requires that all organizations modeled within one supply chain optimization plan use the same currency.

### Replenishment Sourcing

A replenishment source in the supply chain states how you obtain an item. Oracle material planning uses the following three types of sources:

- Transfer from—You purchase the item from another organization in your enterprise; you and the sending organization use the Oracle Applications interorganization shipping functionality to accomplish a transfer of the item.
- Make at—You manufacture the item at your facility.

- Buy from—You purchase the item from a supplier that is outside of your enterprise.

In Oracle Advanced Supply Chain Planning:

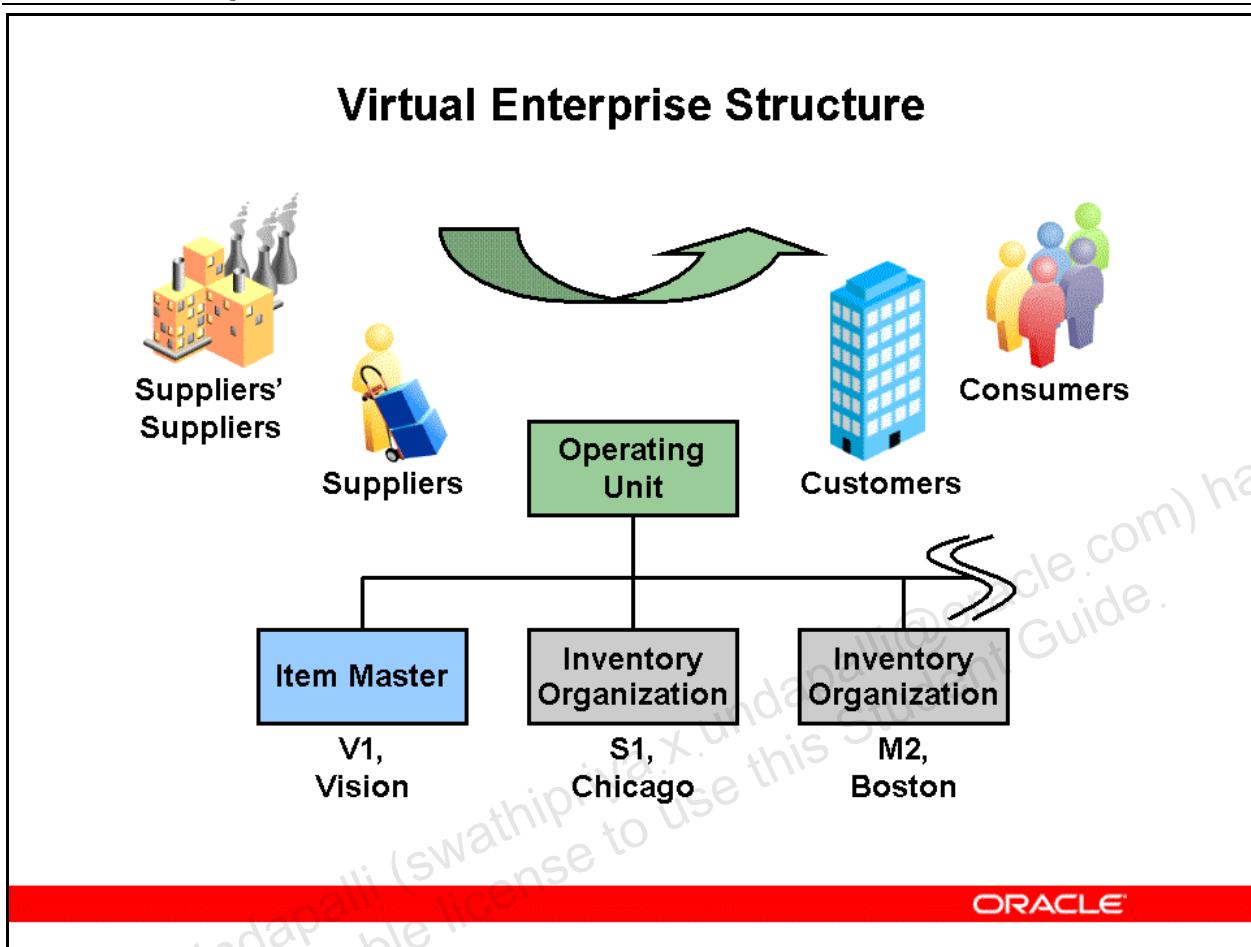
- You can source an item using more than one of these types (split-sourcing).
- You can indicate the future sourcing of an item by using effectivity dates.

To gain benefits of supply chain planning, you must use replenishment sourcing to describe the supply chain to the planning process. You use the following three structures to do so:

- Sourcing rules
- Bills of distribution
- Assignment sets

**Note:** When you create sourcing rules and bills of distribution, you create descriptions of the means by which you can replenish items—you do not reference a specific item number. You use assignment sets to associate specific item numbers with the rules and bills.

## Virtual Enterprise Structure



## Virtual Enterprise Structure

### Inventory Organizations

Each inventory organization reports to one operating unit. You can set up more than one operating unit. Although Oracle Applications does allow multiple item master inventory organizations to be set up, it is always poor practice to maintain more than one item master. You can cross operating units to establish the link between your inventory organizations and your single item master inventory organization.

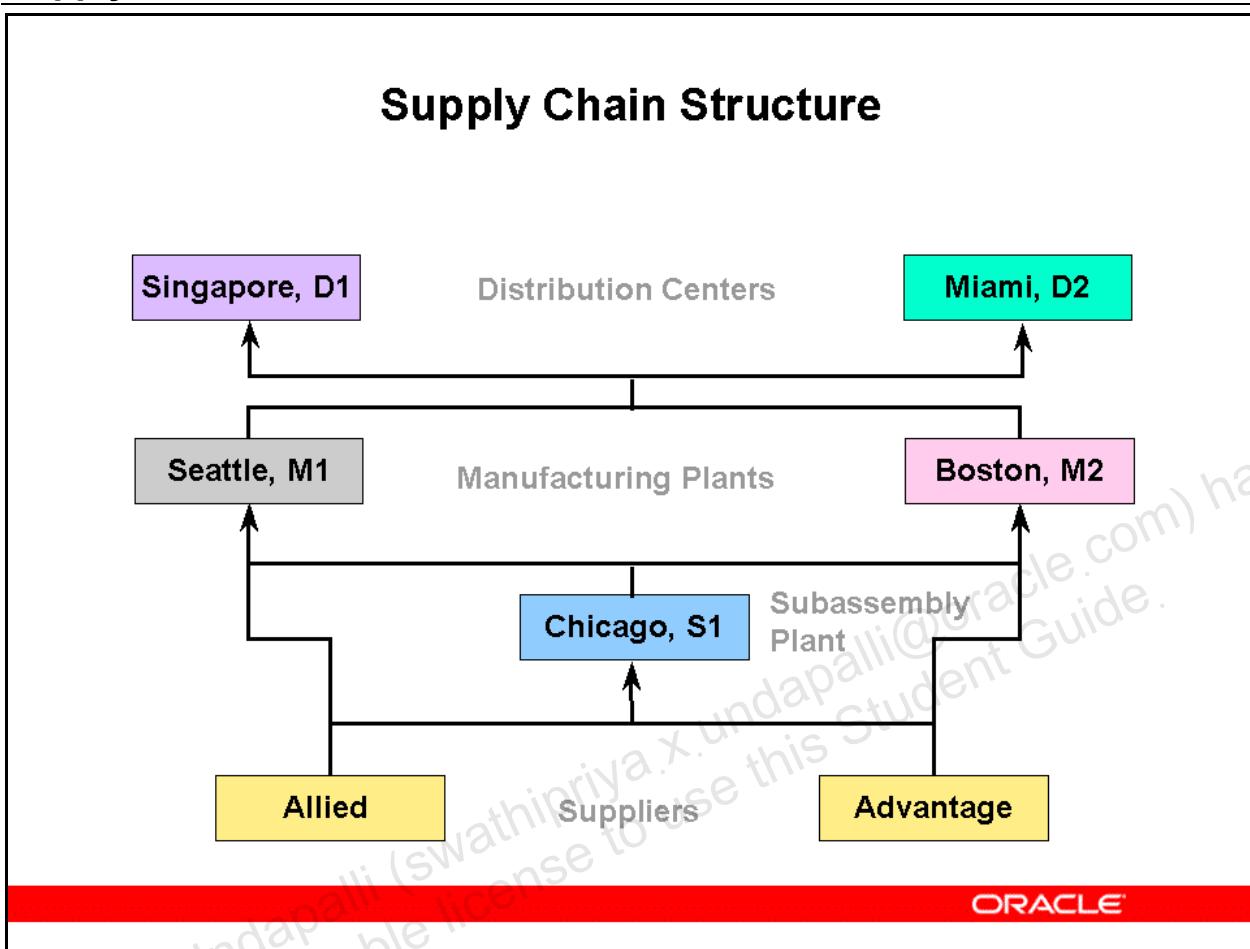
The inventory organization structure is an important prerequisite to specifying item attribute information. Inventory items are defined in the master inventory organization and then enabled in other inventory organizations as appropriate. If you enable an item in more than one organization, you can set different values for the same item attribute in each organization.

### Suppliers and Customers

Suppliers and customers are not necessarily set up as supply chain organizations. This depends on whether you have visibility of supplier or customer inventories. As long as you have access to their information, you can extend your supply chain without limitation back to suppliers' suppliers and forward to customers' customers.

**Note:** You can model supply chains across sets of books and across operating units.

## Supply Chain Structure



### Supply Chain Structure

Supply chain structure is different from inventory organization structure. While the inventory organization structure is static and limited to master organizations and inventory organizations, the supply chain model is dynamic, involves many levels, and can become quite 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 Shipments Between Organizations

### Modeling Shipments Between Organizations

- **Shipping methods**
- **Shipping networks**

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### Modeling Shipments Between Organizations

Use the Manufacturing and Distribution Manager responsibility to navigate to the Application Utilities: SHIP\_METHOD Lookups window.

(N) Inventory > Setup > Organizations > Shipping Method

You use this window to define shipping methods.

You can use either of two windows to model 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 Between Organizations

For inter-organizational transfers, ASCP uses transportation capacity entered on the Shipping Methods form for each inter-organization network link.

Use the Manufacturing and Distribution Manager responsibility to navigate to the Inter-Org Shipping Networks window

(N) Shipping Networks (B) Find <inter-organization network link>

(M) Tools > Shipping Methods to open the window where you can enter shipping methods, transportation time, and weight and volume capacity for each shipping method.

### Modeling Shipments Between Organizations and External Sites

- Inter-location transit time
- Inter-location transit capacity

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### Modeling Shipments Between Organizations and External Sites

Use the Inter-Location Transit Times window to enter transit times and shipping capacities between supplier locations, inventory organizations, and customer locations.

You can set up different transit lead times between each shipping location and receiving location of your customer for each shipping method. You can designate a particular shipping method as the default method.

#### 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.
- The windows for entering transportation capacities are release 11i forms. They are not available in release 11 source instances. Therefore, if your source system uses one of these earlier releases, modeling transportation capacity involves substantial custom programming.

For detailed setup instruction, see Shipping Methods, Inter-location Transit Time in *Oracle Inventory User's Guide*.

## Supply Chain Links

### Supply Chain Links

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

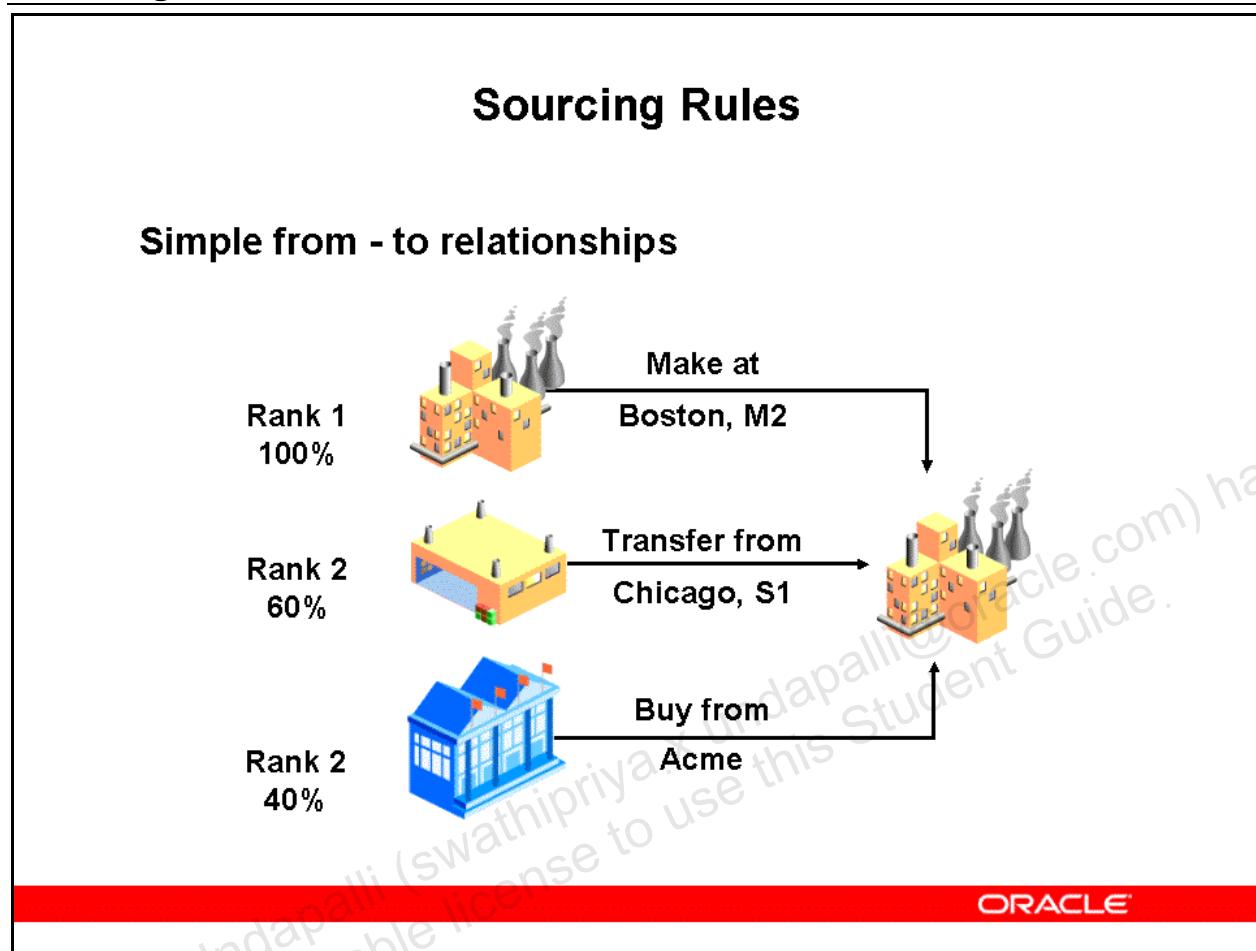
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### Supply Chain Links

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.

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

## Sourcing Rules



## Sourcing Rules

(N) Supply Chain Planning > Sourcing > Sourcing Rules

### Allocation and Rank

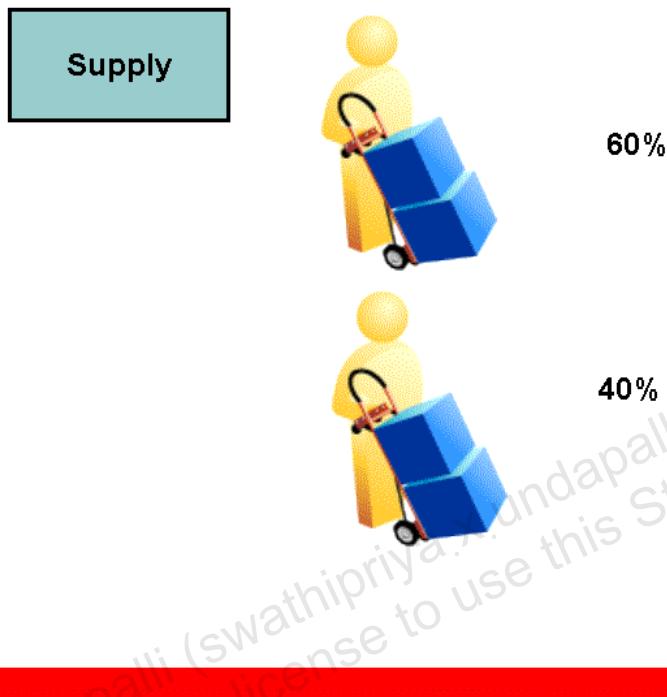
Sourcing rules and bills of distribution determine the movement of material between organizations. These organizations include supplier, manufacturing, and distribution facilities. The rules for allocation and rank have changed for release 11i. The total allocation percentage for all sources within a 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.

The three types of sources are:

- **Transfer From:** Inter-organization 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.

## Allocating Demand to Suppliers

### Allocating Demand to Suppliers



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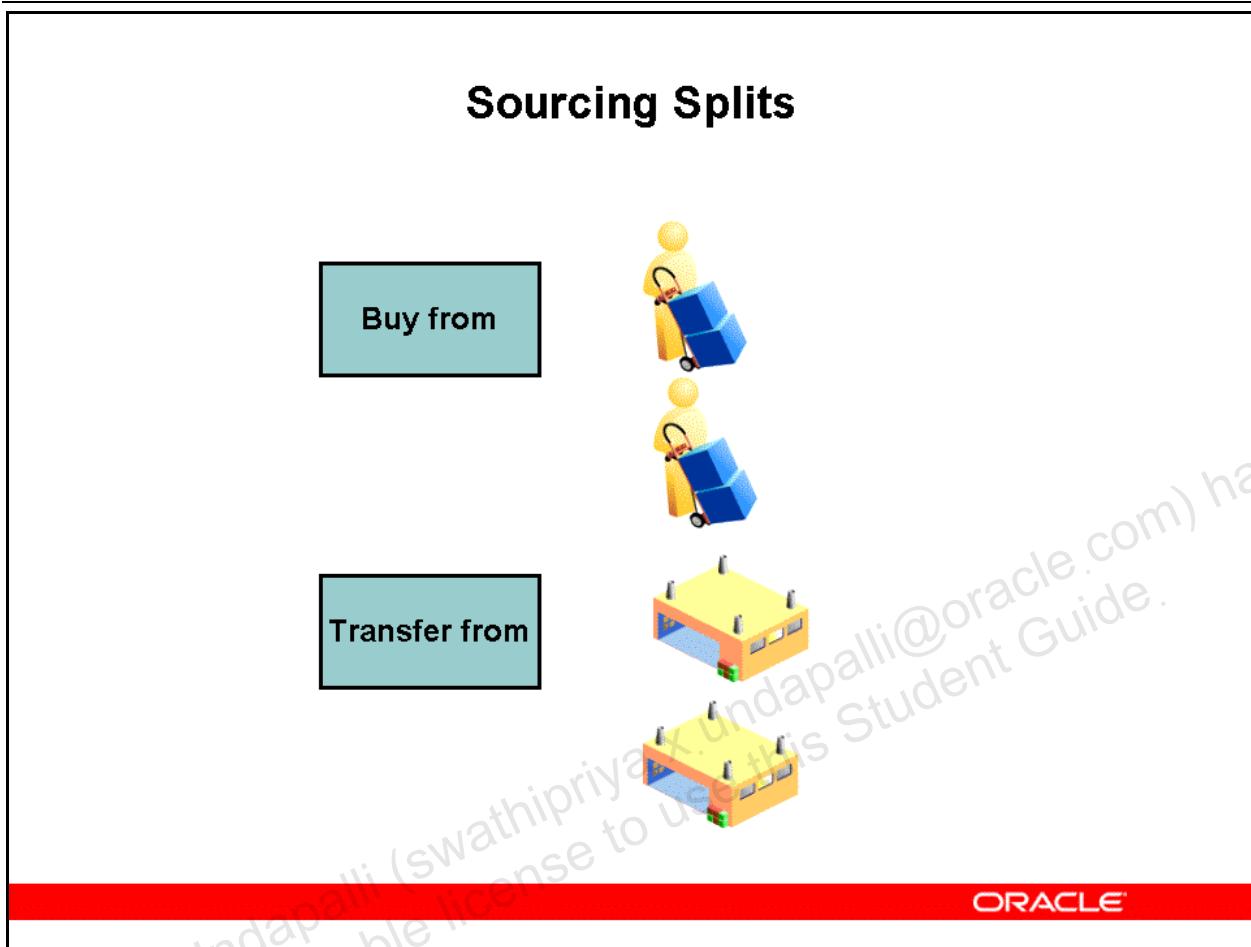
### Allocating Demand to Suppliers

You can define a rank for each source of supply named in the sourcing rules and bills of distribution. You can then define a sourcing percentage for each source within a rank, allowing you to allocate a portion of the total orders to each source.

In unconstrained plans, demand can be divided and allocated to multiple sources according to target sourcing percentages set in the rules.

You can allocate planned orders taking into account historical allocations in unconstrained plans. The enhanced sourcing logic considers historical allocations and allows the splitting of demand to achieve target sourcing percentages.

## Sourcing Splits



### Sourcing Splits

Sourcing splits are useful when supplier contracts require that a company source its materials from suppliers based on specified allocation percentages. Similarly, sourcing splits can be used when requirements such as labor agreements necessitate adherence to allocation percentages from internal organizations.

You can use a plan option to control whether the planning process treats contractual sourcing allocation percentages as constraints, or is free to flex the allocation percentages to achieve plan objectives..

## Allocation Rules

### Allocation Rules

- The total allocation percentage for all sources within a rank must be 100%
- The planning engine 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

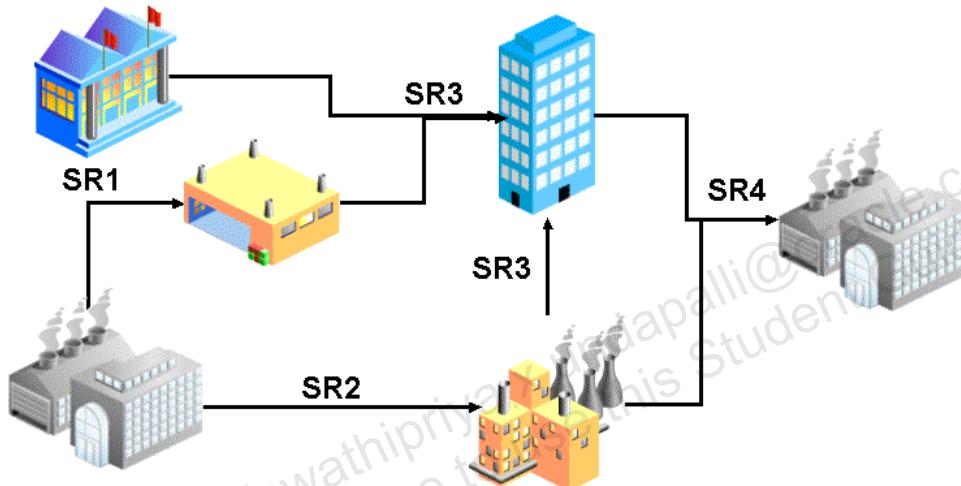
Allocation rule functionality changed with release 11*i*.

- The total allocation percentage for all sources within a rank must add up to 100 percent.
- The planning engine uses rank 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.

## Bills of Distribution

### Bills of Distribution

Model relationships that would otherwise require multiple sourcing rules to describe



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### Bills of Distribution

(N) Supply Chain Planning > Sourcing > Bills of Distribution

When material flows through three or more organizations, bills of distribution describe supply chain links more efficiently than do sourcing rules. However, any relationship that can be described by bills of distribution can also be described by a set of sourcing rules. Most users find it easier to understand sourcing rules.

**Note:** The term Bills of Distribution is a misnomer in that it leads to the interpretation that this type of rule describes an outward bound, or push type of sourcing relationship. In fact, both sourcing rules and bills of distribution are used only to pull material from sources to destinations.

## Assignment Sets

### Assignment Sets

**ASCP Plan: XYZ**

**Assignment Set: ASN-S1**

**Item: CM41401**

**Organization: S1**

**Sourcing Rule: SR-S1**

**Supplier: Acme**



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### Assignment Sets

Items and item categories 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.

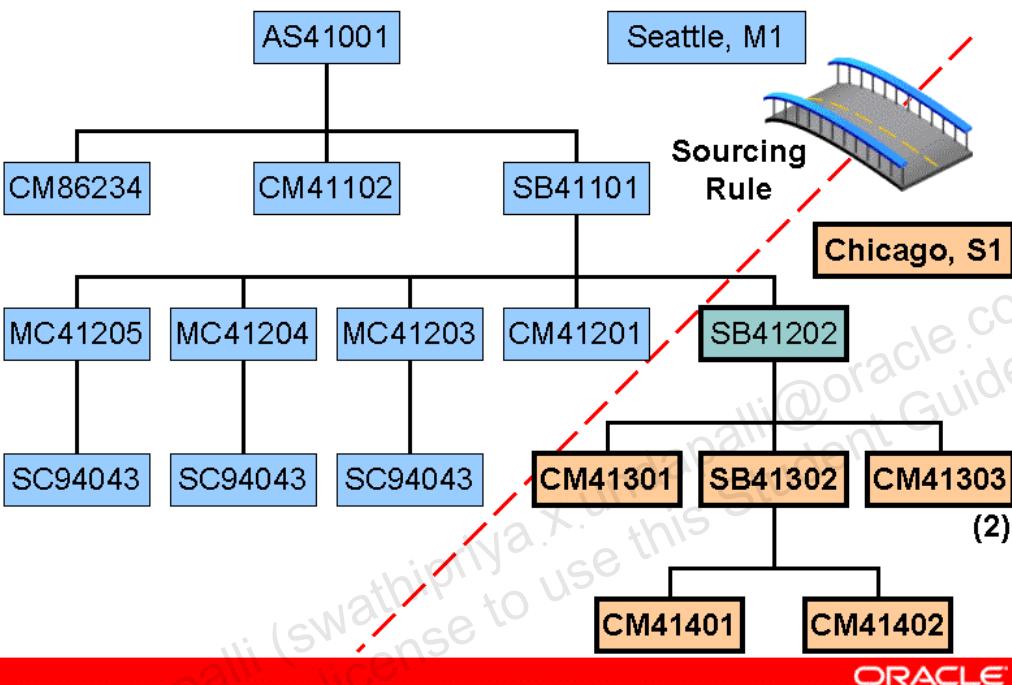
You specify an assignment set when launching the ASCP planning process for a named supply chain plan in the Plan Options window for that plan name.

For example:

1. A sourcing rule named SR-S1 is set up in Chicago organization S1 with the intention that this rule would apply to items purchased from a supplier named Acme.
2. In the header of the Assignment Set window, assignment set name ASN-S1, is defined.
3. In the Assignments region, rule SR-S1 is listed and assigned to item CM41401.
4. The assignment set name (ASN-S1) is specified in the Options tabbed region of the Plan Options window as part of the process for defining a named ASCP plan.
5. When the ASCP plan is generated, time-phased net requirements for item CM41401 for the Chicago organization spawn messages to the appropriate planner. The messages suggest requisition quantity, supplier (Acme), and purchase order release date.

## Assignment Sets

### Assignment Sets



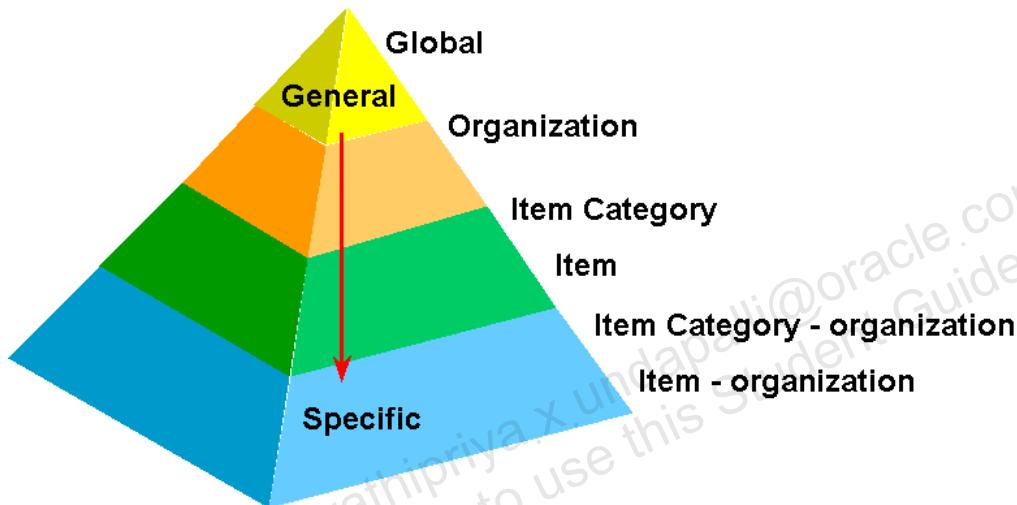
### Assignment Sets

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.

## Sourcing Assignment Hierarchy

### 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 levels. The levels are listed from general to specific. Specific sourcing assignments override general assignment levels.

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

### Powerful Maintenance Functionality

The example used in this course does not demonstrate an important strength of Oracle's patented assignment set technology. By using the power of the assignment set hierarchy, maintaining sourcing relationships is easy. For example, when a plant receives all items

belonging to a category such as fasteners from Supplier A, then the rule is assigned to an item category. Say that at a later date, a specific fastener is sourced from a different supplier B. That specific item (only) is assigned to a different sourcing rule. The detailed-to-general hierarchy causes the specific item to be sourced from Supplier B, while all other fasteners are still sourced from Supplier A.

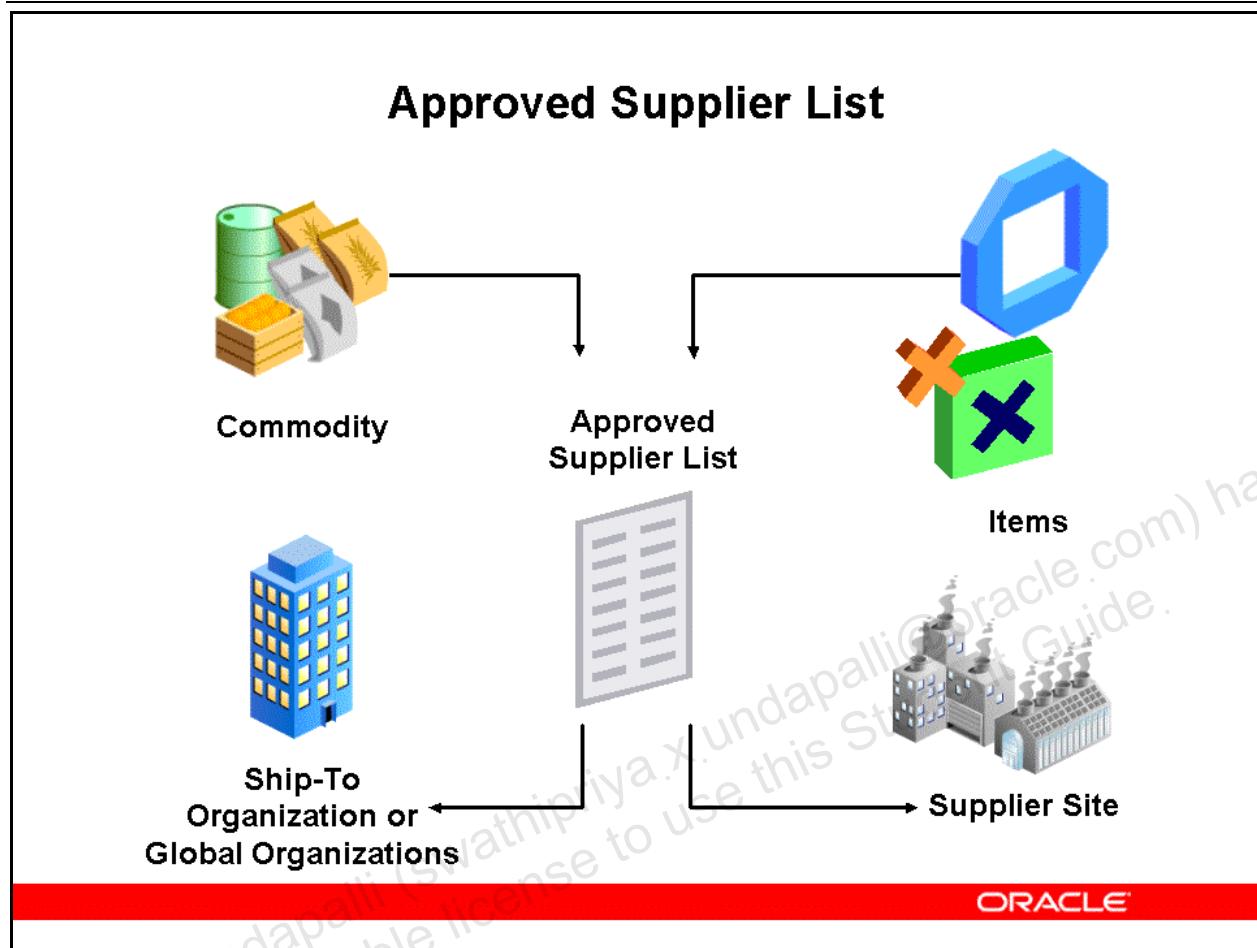
## Topic Overview: Suppliers

### Topic Overview: Suppliers

- **Approved supplier list**
- **Approved supplier list functions**
- **Enhanced sourcing**
- **Supplier sourcing setup**
- **Supplier-item attributes**
- **Supplier capacity**

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## Approved Supplier List



### Approved Supplier List

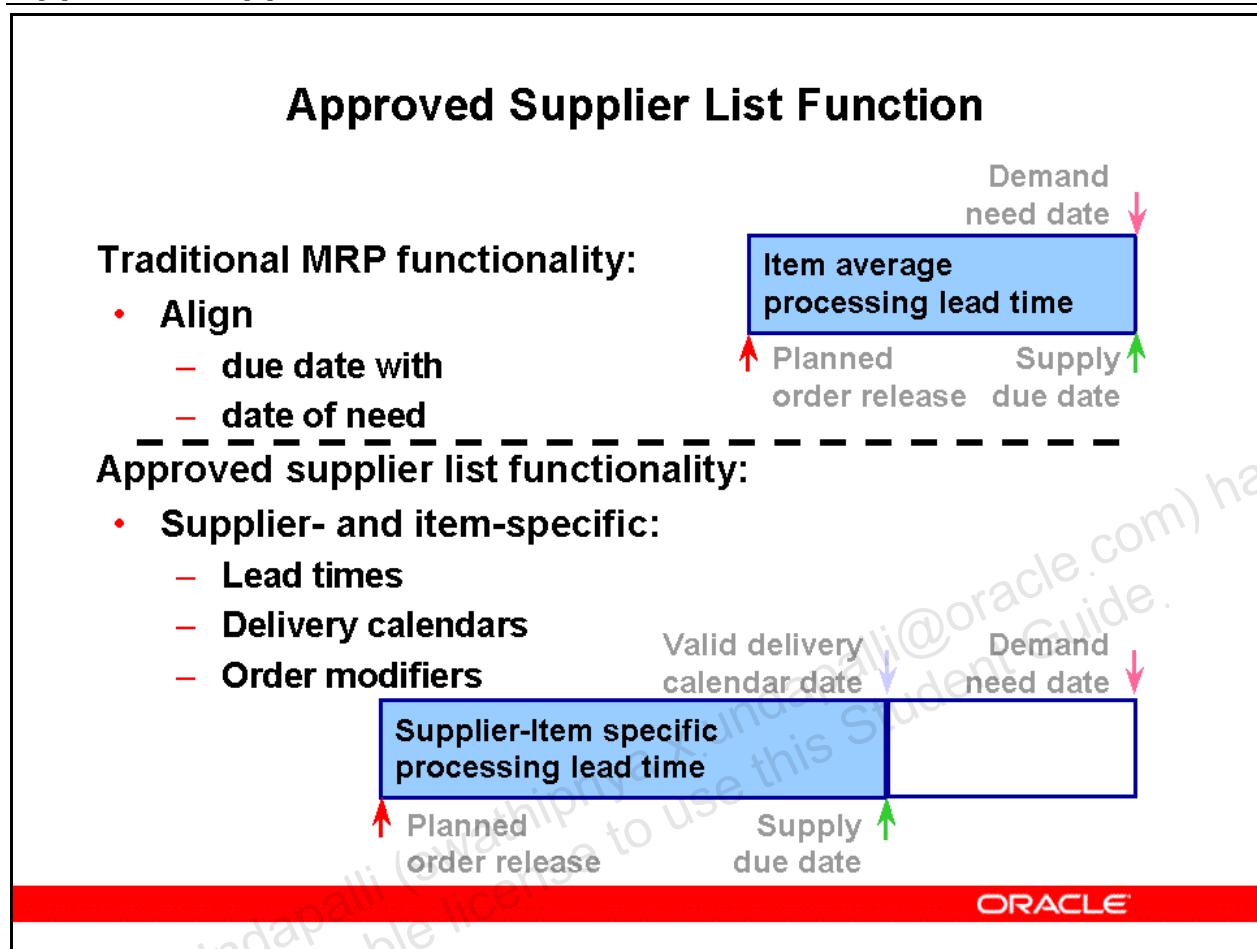
Procurement organizations maintain lists, either formally or informally, that associate the items and services they buy with the companies that supply them. An approved supplier list (ASL) is a controlled global repository of information that links items and commodities to the suppliers and supplier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

**Note:** The ASL entry needs to be global for Oracle Advanced Supply Chain Planning to recognize it (Global? = Yes on the Record Details tab).

## Approved Supplier List Function



### Approved Supplier List Functions

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

The approved supplier list provides greater accuracy in making lead time offset calculations during the planning process. 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.

You can use delivery calendars to specify valid delivery dates for your supplier and item combinations. The calendar defines valid dates that an organization can receive an item from each supplier. This allows 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 valid delivery calendar date to arrive at an adjusted planned order release date.

You can also define supplier-specific order modifiers by item and by supplier site. Planning respects the order modifier quantities as defined for the sources of the item.

## Enhanced Sourcing

### Enhanced Sourcing

- **Based on capacity constraints**
- **Use flexible tolerance fences to model supplier capacity constraints that can change with advance notice**

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### Enhanced Sourcing

You can specify supplier-item specific capacity 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.

## Enhanced Sourcing

### Enhanced Sourcing

- **Based on historical allocations**
- **Disable ASL entries**

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#### Purchase Order Allocation

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.

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 Approved Supplier List Entries

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

## Supplier Sourcing Setup

### Supplier Sourcing Setup

- **Define approved suppliers**
- **Define receiving calendar**
- **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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### Enhanced Sourcing Setup Steps

This describes the process of setting up the supplier-item attributes:

- Approved supplier list:
  - Checkbox 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 on the Supplier-Item Attributes window
- Supplier-Item Attributes window, Planning Constraints tabbed region:
  - Default order processing lead time
  - Default order quantity modifiers
  - Receiving day calendar
  - Date effective supplier capacity
  - Supplier capacity tolerance fences
- Receiving calendar specifies valid delivery dates by organization, supplier, and item
- Sourcing rules and bills of distribution
- Revised allocation and ranking rules

## Supplier-Item Attributes

### Supplier-Item Attributes

- **Delivery calendar**
- **Processing lead time**
- **Order modifiers**
- **Supplier flexible capacity tolerance fences**

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### Supplier-Item Attributes

Use the Manufacturing and Distribution Manager responsibility to navigate to the Planning Constraints tabbed region of the Supplier-Item Attributes window.

(N) Purchasing > Supply Base > Approved Suppliers List (B) Attributes (T) Planning Constraints

**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.

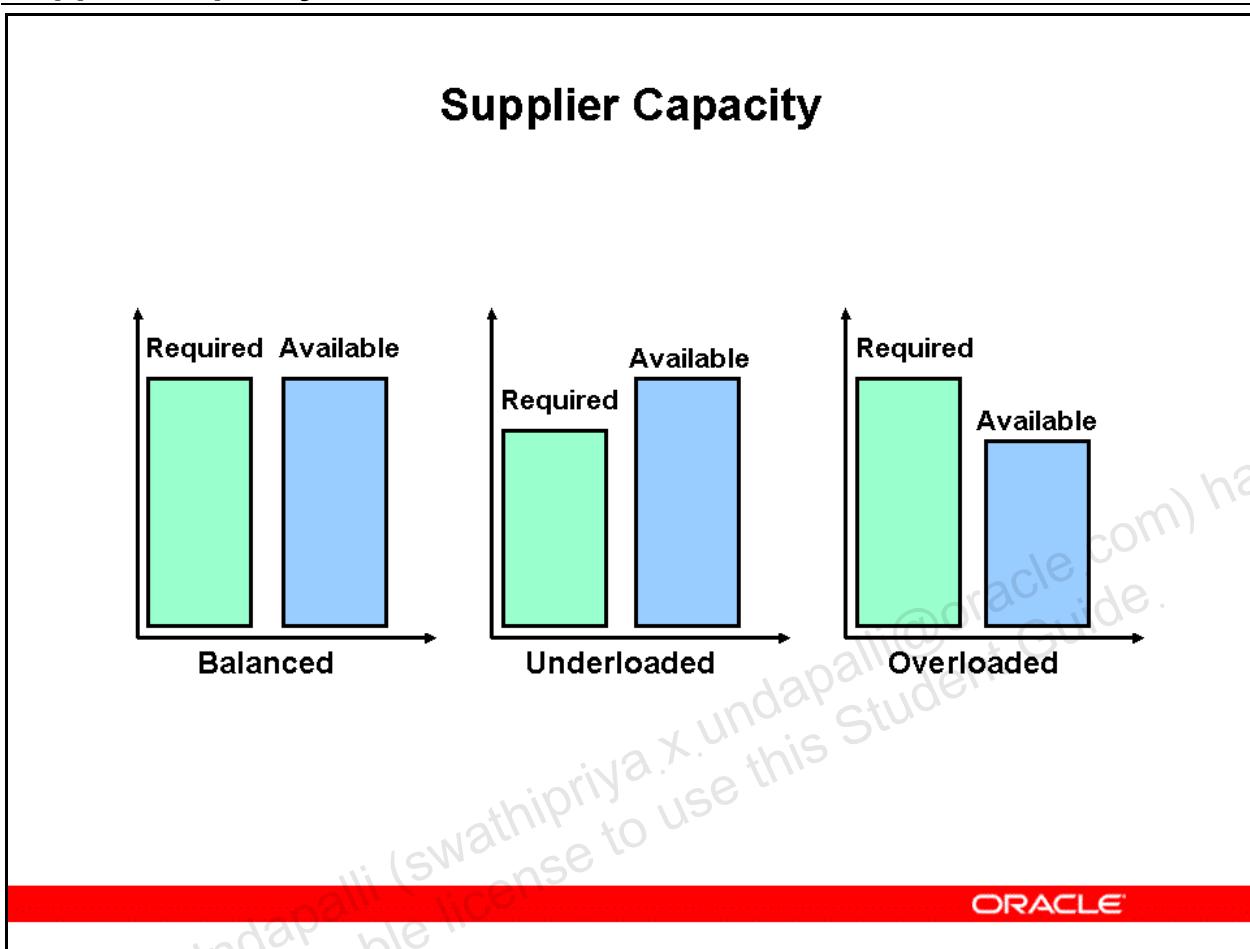
**Order Modifiers.** This supplier-item attribute overrides the organization item order modifier attributes for the minimum order quantity and lot size multiple.

**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.

## Supplier Capacity



### Supplier Capacity

Supplier capacity is the available capacity of your suppliers to supply specific items.

The planning engine attempts to source planned orders for buy from items from the primary source. If the primary source does not have the capacity to fulfill your demand, the planning engine suggests sourcing from other sources that you have specified.

## Quiz

### Quiz

**The process of suggesting alternative sources that you have specified is called:**

- 1. Supplier Sourcing**
- 2. Supplier Capacity**
- 3. Enhanced Sourcing**
- 4. Overloaded Capacity**

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**Answer:** 3. Enhanced Sourcing

### Topic Overview: Lead Times and Time Fences

- **Lead times**
- **Lead times in requirements explosion**
- **Cumulative lead time**
- **Time fences**

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## Lead Times

### Lead Times

- **Preprocessing**
- **Processing**
- **Post processing**
- **Fixed**
- **Variable**
- **In-transit**
- **Lead time lot size**

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### Lead Times

Planning suggests planned orders release dates that are in advance of the order due date by the lead times specified on the Lead Times tab of the Item Master window.

*Preprocessing lead time* accounts for the time required to prepare orders prior to releasing them to a supplier. *Processing lead time* accounts for time at the supplier prior to their beginning work on the order. *Post processing lead time* accounts for the delay between your receiving dock and in stock ready for use. This element can include time quality testing, quarantine, and processing inventory receipt transactions.

Use *fixed lead time* to model situations when the manufacturing (or supplier) lead time is nearly independent of order quantity. When processing time is small in comparison to queue time and move time, one can often assume for planning purposes that the lead time will be the same, regardless of the order quantity.

Use *in-transit lead time* to specify the shipment time between facilities (organizations) in your enterprise.

*Variable lead time* works together with the *lead time lot size* to calculate a lead time that is proportional to order quantity.

Constrained and optimized plans schedule resource by resource rather than by lead times.

## Lead Time Offset

### Lead Time Offset

- **Total lead time:**
  - Preprocessing
  - Processing
  - Post processing
- **Cumulative manufacturing lead time**
- **Cumulative total lead time**
- **User-defined lead time**

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### Lead Time Offset

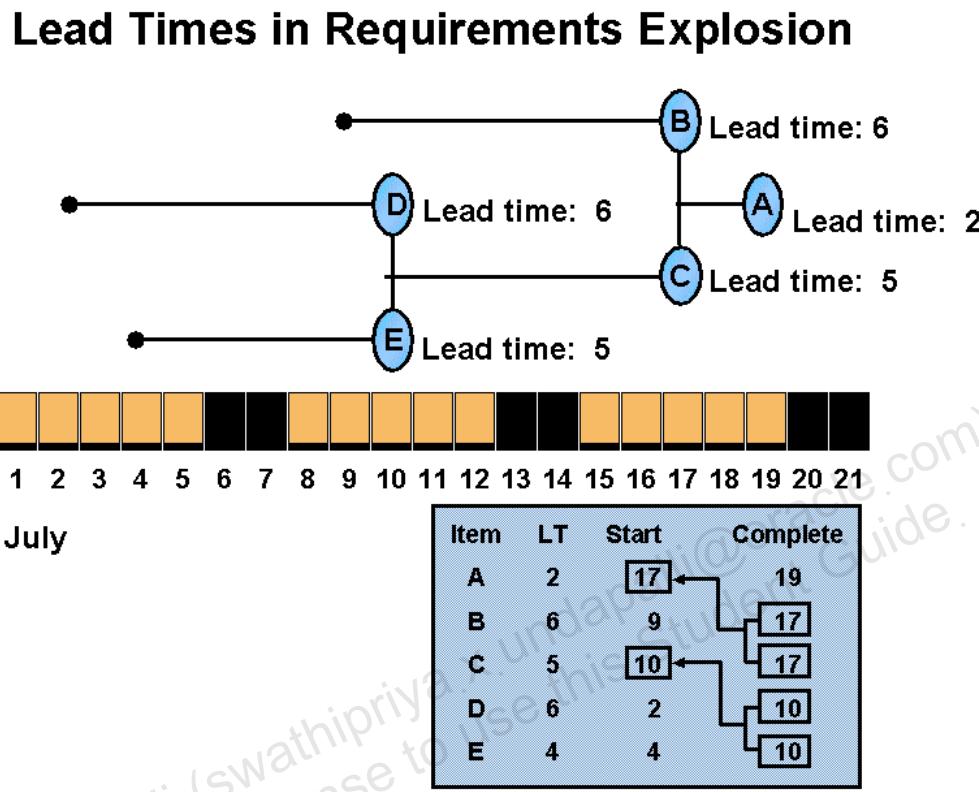
The manufacturing cumulative lead time, total cumulative lead time, as well as the sum of the three processing lead times specified on the Lead Times tab of the Item Master window, can be selected while setting Planning, Demand, ATP Infinite-Supply, and Exception Period time fences.

- *Total lead time* is the sum of the preprocessing, processing, and post processing lead times.
- *Cumulative manufacturing lead time* is the manufacturing lead time of an assembly plus the largest adjusted cumulative manufacturing lead time of its components.
- *Cumulative total lead time* is the total lead time of an assembly plus the largest adjusted cumulative total lead time of its components.

In addition to the above, the user has an option to specific a *user-defined time fence*. The number of days in the user-defined time fence is defined on User-Defined Time Fence field located on the Planning Exception Sets window.

(N) Supply Chain Planning > Setup > Exception Set

## Lead Times in Requirements Explosion



## Lead Times in Requirements Explosion

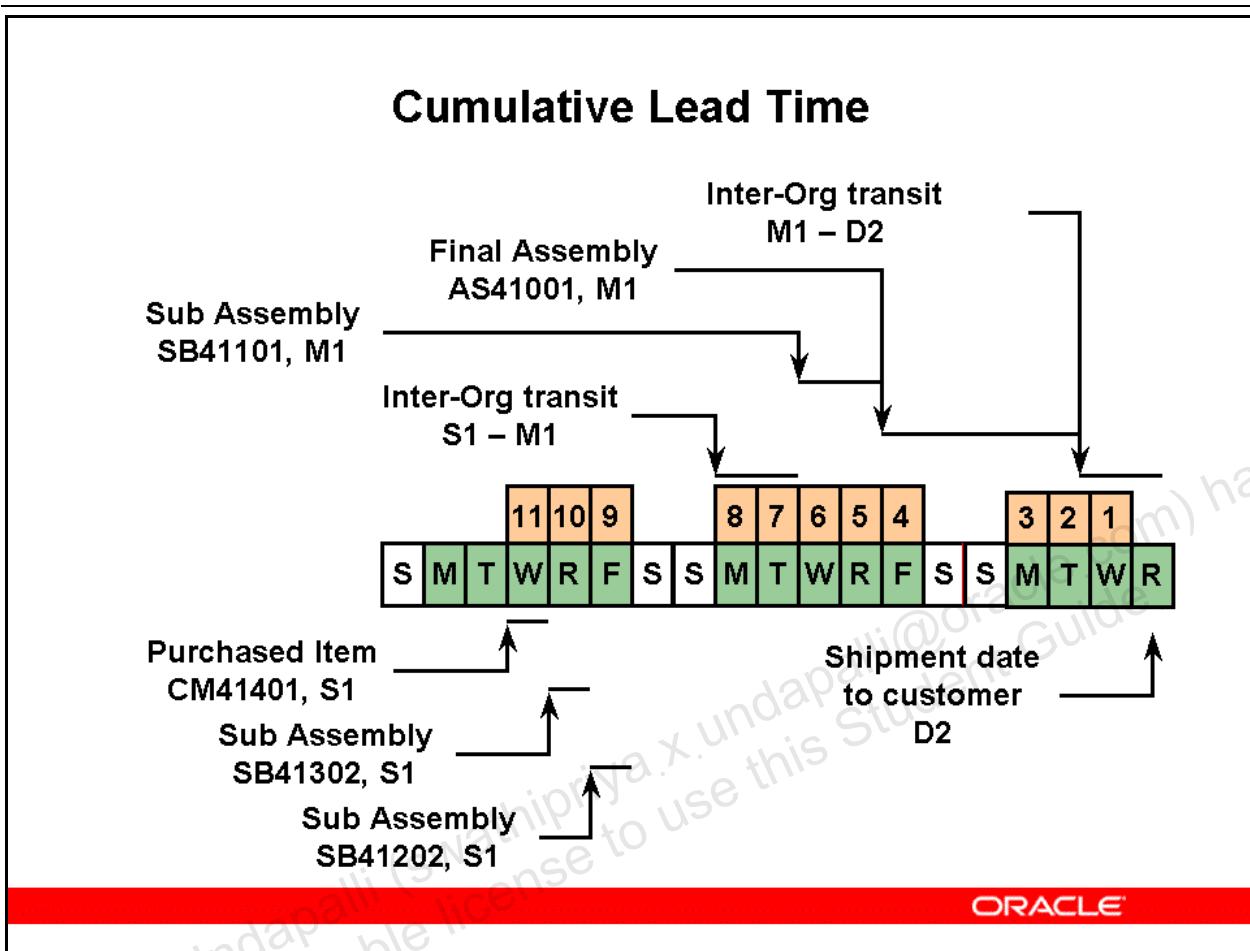
The planning process begins by using item and transportation lead times to set start dates and due dates for supplies. During detailed scheduling, it may modify those start dates and due dates depending on:

- Manufacturing, supplier, and transportation capacity
- Workday, supplier, and transportation calendars

The planning process plans that you should receive material to inventory by the day that you need to issue it. For example, if you need to begin producing the 100 of item A on Wednesday, you will need the 200 of item B into inventory by Wednesday to issue it on that day. Therefore, the item B due date is Wednesday.

**Note:** Oracle material planning expects that you will receive material due into inventory by the *beginning* of the business day on which it is due (or at least before you need to issue it). This may require you to receive it into inventory by the close of business on the previous day.

## Cumulative Lead Time



### Cumulative Lead Time

The cumulative lead time shown in the figure is 11 days. To ship the end item AS41001 from the Miami Distribution Center (D2) to the customer on the Thursday at the end of the time line, a purchase order for the purchased component CM41401 needs to be released in the Chicago Subassembly Plant, S1 on the Wednesday shown at the beginning of the time line.

Inter-organization transit, M1 – D2	2 days
Final assembly AS41001, in M1	2 days
Sub assembly, SB41101, in M1	2 days
Inter-organization transit, S1 – M1	2 days
Sub assembly, SB41202, in S1	1 day
Sub assembly, SB41302, in S1	1 day
Purchased item, CM41401, in S1	1 day
TOTAL is 11 days	

## Time Fences

### Time Fences

**Time fences should be set to the lowest values that are practical.**

- **Planning**
- **Demand**
- **Release**

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### Time Fences

Time fences can be used to freeze near-term plans and reduce the occurrence of exception messages that recommend changes to the plan, which as a practical matter, should not be implemented. However, time fences also reduce the ability of the planning process to accommodate necessary changes in demand. Therefore, time fences should be set to the lowest values that are practical.

#### Planning Time Fence

Planning Time Fence is a time parameter associated to an organization-item. Operations and orders (planned orders, work orders, purchase orders, transfer orders) with start dates within the planning time fence will not be permitted to be rescheduled or cancelled. Operations and orders with start dates beyond the planning time fence will not be permitted to be rescheduled inside the planning time fence. A profile option, MSO: Firm Operations/Orders Within Time Fence, controls whether operations and orders that fall within the planning time fence are automatically firmed or not.

## Demand Time Fence

The demand time fence is used when you load forecasts into a master schedule. Depending on the option selected, this field establishes the date before which the planning engine cancels forecast demand.

## Release Time Fence

A release time fence of x days automatically firms and releases to the execution system planned orders in the time interval [plan start date, plan start date + x]. Subsequent planning runs then treat these planned orders as scheduled receipts, not subject to manipulation via order modifiers.

## Related Profile Options

The planning engine decides whether to calculate Planning Time Fence Date based on plan option Planning Time Fence Control. These profile options instruct the planning engine to create natural time fences and to change Planning Time Fence Date to the natural time fence date if the natural time fence date is later than the calculated Planning Time Fence Date:

**MRP: Create Time Fence:** Instructs the planning engine to create a natural time fence for an item at the completion date of the latest firm discrete job, purchase order, flow schedule, or shipment.

**MRP: Firm Planned Order Time Fence:** Instructs the planning engine to create a natural time fence for an item at the completion date of the latest firm planned order.

**MSC: Firm Internal Requisition Time Fence:** Instructs the planning engine to create a natural time fence for an item at the completion date of the latest firm internal requisition.

These profile options affect the firming of specific supply types:

**MRP: Firm Internal Req Transferred to OE:** Instructs the planning engine to consider internal requisitions that have transferred to Oracle Order Management as firm.

You cannot reschedule transferred internal requisitions from Oracle Advanced Supply Chain Planning. To reschedule it, cancel the internal requisition and the internal sales order line in the source instance and create them again.

Since the planning engine coordinates the dates between internal requisitions and their internal sales orders, it never reschedules the internal sales order of a firm internal requisition.

**MRP: Firm Requisitions within Time Fence:** Instructs the planning engine to net purchase orders before netting purchase requisitions. Therefore, it may cancel or reschedule out some purchase requisitions that have earlier dates than some of the purchase orders for the same item.

**MSC: Firm Intransit and PO in Receiving Supplies:** Instructs the planning engine, in unconstrained plans, to consider intransit purchase orders and purchase orders in receiving as firm. It issues reschedule recommendations but you cannot release them from Planner Workbench.

**MSC: MPS Auto-Firm All Planned Orders:** Instructs the planning engine, for master production schedule plans, to firm all planned orders.

- When a master production schedule is a demand schedule for another plan, the planning engine considers all master production schedule planned orders as firm, regardless of this profile option.

**MSO: Firm Orders/Operations within Time Fence:** Instructs the planning engine how to use planning time fence control on purchase orders, purchase requisitions, internal requisitions, discrete jobs, and flow schedules. The effect depends on order type; see Planning Time Fence Logic for Supply Types in this topic.

**MSO: Net All Firm Supplies Before Creating Planned Orders:** Instructs the planning engine to net firmed supplies available in any future period before creating new planned orders.

**Profile option MRP:** Recommend action within Planning Time Fence affects exceptions and recommendations. It instructs the planning engine, in unconstrained plans, to generate recommendations for scheduled receipts earlier than Planning Time Fence Date.

## Quiz

### Quiz

**Post processing, fixed, variable, and in-transit are examples of lead times.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Quiz

### Quiz

**Total lead time is the sum of the preprocessing and post processing lead times.**

- 1. True**
- 2. False**

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**Answer:** 2. False *Total lead time* is the sum of the preprocessing, processing, and post processing lead times.

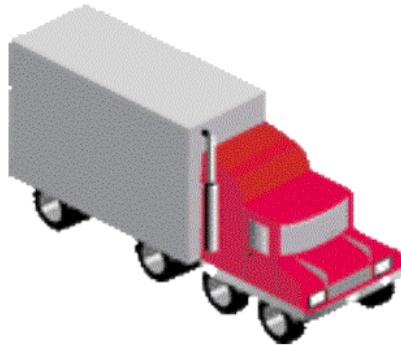
### Topic Overview: Transportation

- **Shipping methods**
- **Shipping network**
- **Transit times**
- **Zones and regions**

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## Shipping Methods

### Shipping Methods



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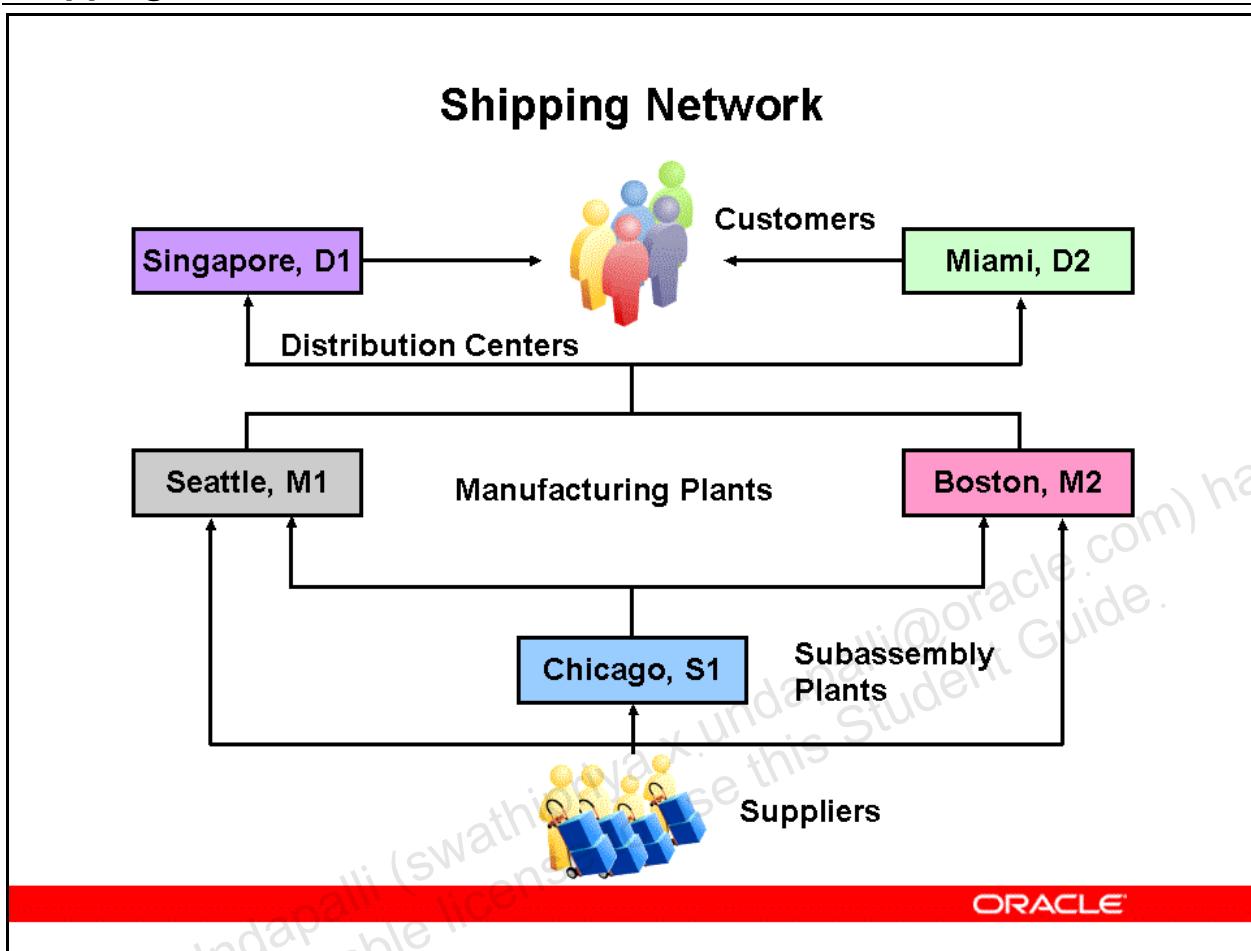
### Shipping Methods

Shipping methods are ways that you transport your goods.

Ways include:

- Carriers, for example, ABC Trucking
- Services, for example, overnight express

## Shipping Network



### Shipping Network

The shipping network consists of all the routes (shipping lanes) between your organizations, customers, and suppliers.

## Transit Times

### Transit Times

- **Inventory organizations**
- **External site and inventory organization**
- **Ship method**

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### Transit Times

Transit times are the times between locations in the shipping network. You can indicate a transit time for each shipping method.

You indicate transit times:

- Between organizations as part of the shipping methods
- Between external locations (supplier and customer) and inventory organizations as part of the inter-location transit times

You assign an in-transit calendar to each carrier to indicate the carrier's workdays and non-workdays.

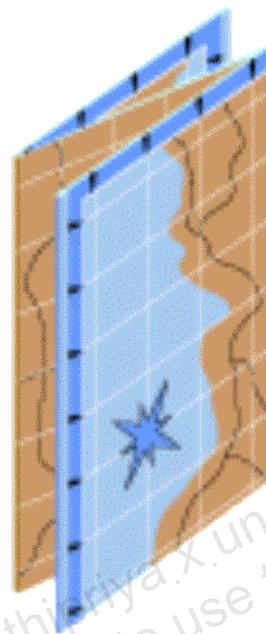
Ship method is the combination of:

- Carrier
- Service level, for example, 1-day air or 2 day ground
- Mode, for example, air, truck, LTL

You associate each carrier with a ship method and the carrier uses the carrier calendars.

## Zones and Regions

### Zones and Regions



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#### Zones and Regions

You can indicate transportation times and capacities by using zones and regions. Zones and regions are geographical regions for which you can specify common transportation information as an alternative to specifying it for each transportation resource in the region or zone.

You attach calendars to carriers and you specify certain carriers in the assignment set between a zone and an organization.

Oracle Shipping Execution maintains zones and regions.

## Quiz

### Quiz

**A shipping network is all of the routes (shipping lanes) between your organizations, customers, and suppliers.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Summary

### Summary

**In this module, you should have learned how to:**

- **View enterprise data**
- **View item data**
- **View material data**
- **View resource data**
- **View sourcing data**
- **View supplier data**
- **View calendar, lead time, and time fence data**
- **View transportation data**

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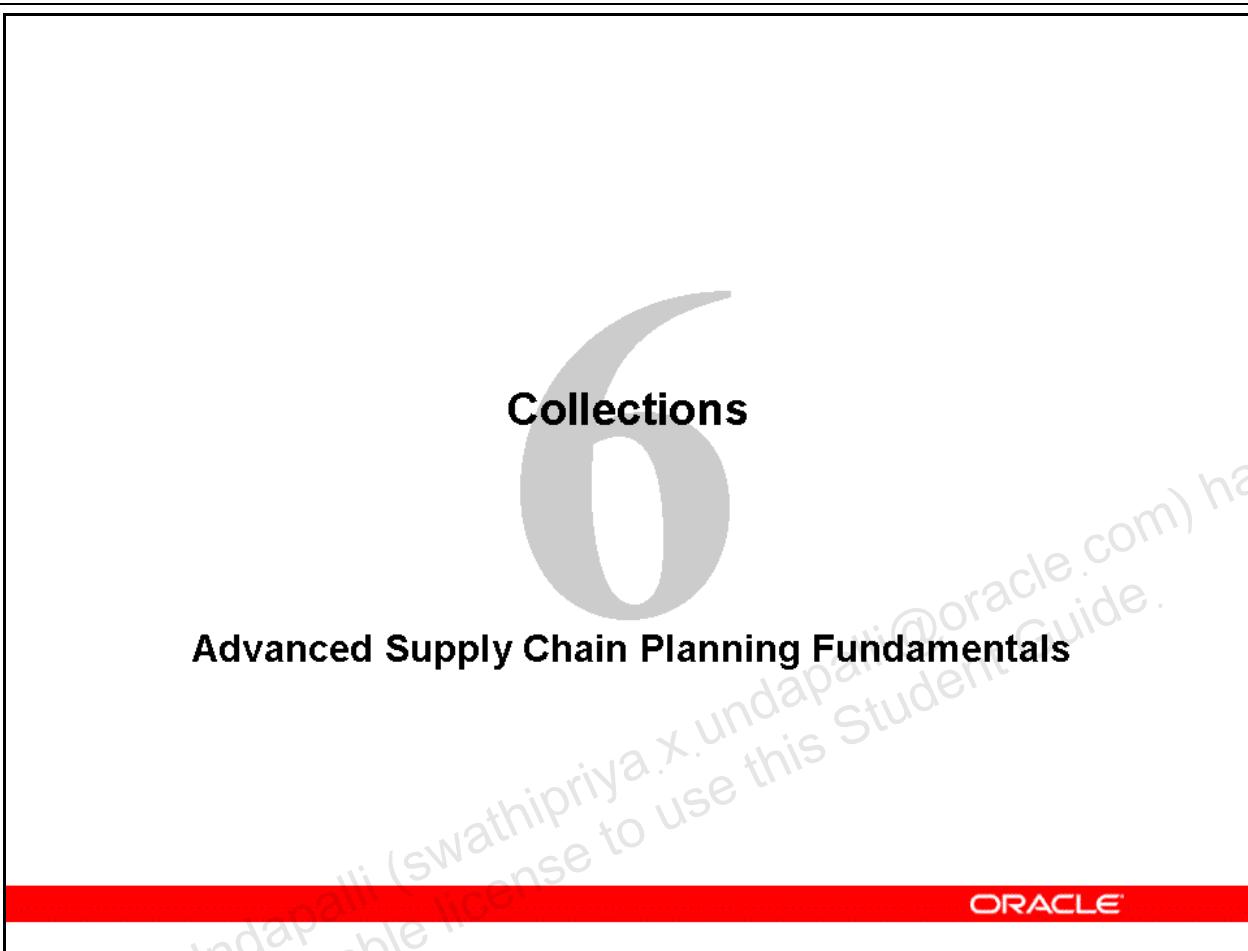
## **Collections**

### **Chapter 6**

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## Collections



## Objectives

### Objectives

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

- **Describe collections**
- **Describe collection exceptions**
- **View collections**

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## Module Overview: Topics

### Module Overview: Topics

- **Collections**
- **Collection exceptions**

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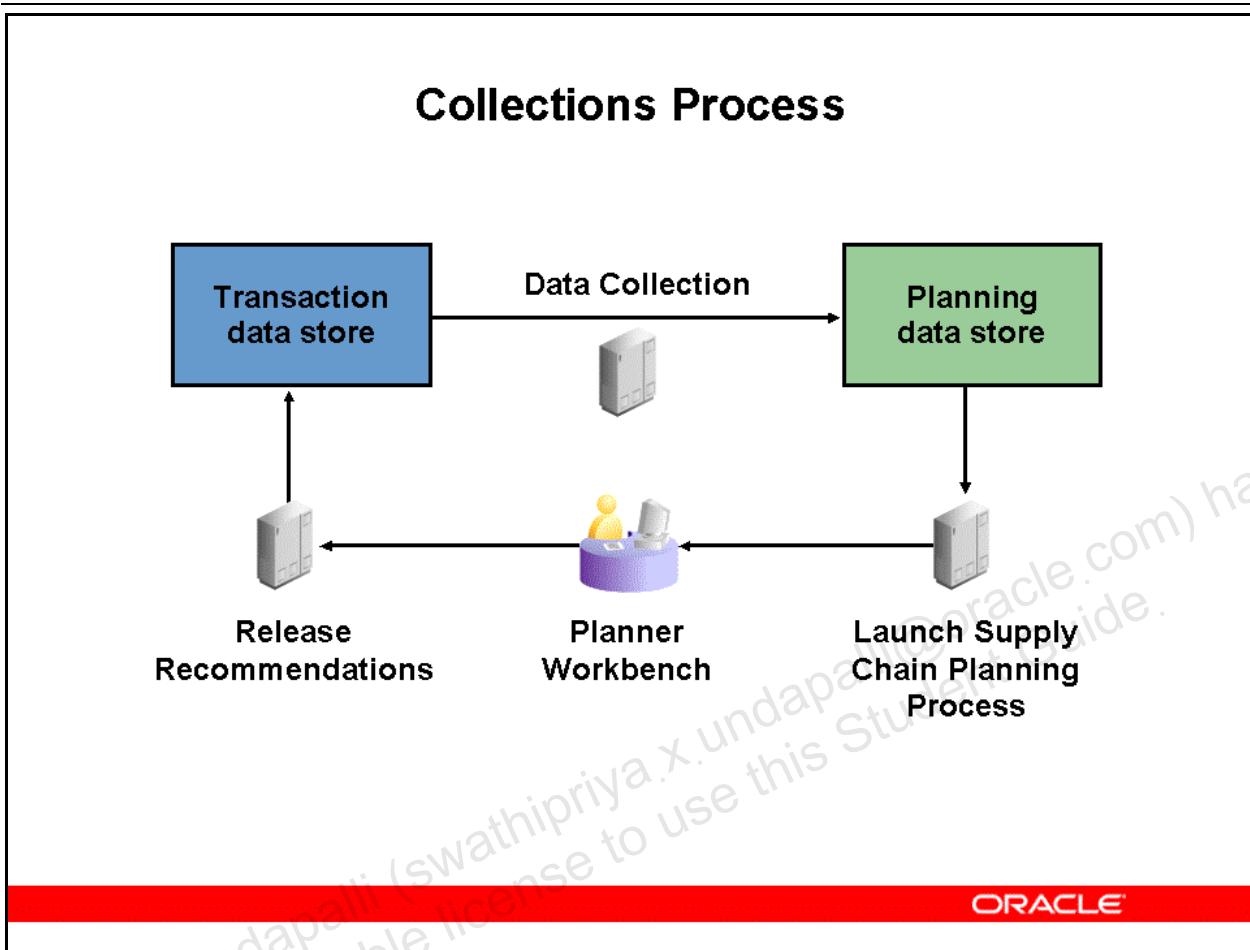
## Topic Overview: Collections

### Topic Overview: Collections

- **Collections process**
- **Scheduling and frequency**
- **Methods**
- **Type**
- **Collections processing**
- **Collections parameters**
- **Collections workbench**

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## Collections Process



### Collections Process

Between launches of the planning engine, you collect the data. Collecting data makes a copy of all or part the transaction data store in the planning data store.

Oracle Advanced Supply Chain Planning uses two data stores. The data stores that it uses are:

- Transaction data store: The transaction systems in your facilities. The transaction systems are those that your workers use to duplicate your actual “system”, for example, entering sales orders and recording inventory receipts.
- Planning data store: The planning system. The system that plans what the transaction systems need to do to meet demand.

To perform planning, data must move from the transaction data store to the planning data store.

As a planner, you need to be aware of the timing issues involved in data collection. Certain data in the planning data store will or will not match data in the transaction data store depending on your organization’s data collection schedules.

## Scheduling and Frequency

### Scheduling and Frequency



### Scheduling and Frequency

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 the data collection schedules 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 detects and collects only changed data. Collecting data more frequently results in less work during each collection.

Your enterprise needs to schedule collections in conjunction with your planning launches. For example:

- If you plan weekly, you need to run collections at least once a week.
- If you plan daily, you might schedule collections after shop floor feedback and order entry are finished for the day.
- If you run our facilities 24x7, you need to select appropriate times, run collections before launching the planning process, and make sure that all know the schedule.

## Methods

### Methods



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#### Methods

The Complete Refresh method clears all transaction data for all business entities from the planning server (for the source instance being collected), then copies over information about the user-selected entities. This method can be time consuming.

The Targeted Refresh method clears transaction data for only the user-selected business entities from the planning server, and then copies the entity information over from the transaction instance. Information about nonselected entities remains intact on the planning server. All planning business entities are supported by Targeted Refresh collections.

The Net Change Refresh method copies only incremental changes to business entities to the planning server (and is thus faster), but is supported mainly for demand and supply business entities only.

#### Selecting Methods

You should use Complete Refresh the first time you perform collections from a source instance to the planning server. You may also wish to use complete refresh collections after a significant proportion of the setup data in your transaction system has been altered, and you would like to make a fresh copy of all source instance business entities (items, bills of material,

sourcing rules, resources, and so on) on the planning server. You typically collect all business entities in a Complete Refresh Collection.

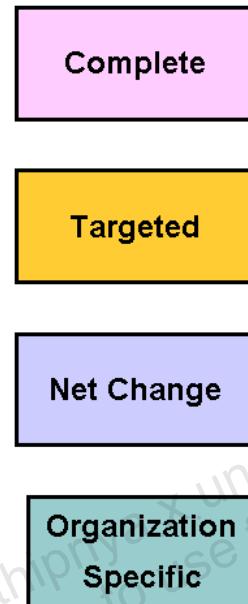
You should use Net Change Refresh if you would like to update the supply and demand picture on the planning server as quickly as possible, and the incremental changes to supply and demand in the source instance since the last collection have not been extensive relative to the existing (already collected) body of supply and demand information. In this case, Net Change Refresh is the fastest way to achieve the desired update of the planning server operational data store, because it copies over from the source instance only the incremental changes in supply and demand since the last collection.

You should use Targeted Refresh if you would like to update the planning server information for some (but not all) business entities, and some of these entities fall outside the category of supply and demand entities supported by Net Change Refresh. For example, to update the planning server with a newly rebuilt manufacturing calendar, you would run Targeted Refresh collections for just the calendar business entity. Data on the planning server about all other business entities would remain unaffected by this collection.

You would also use Targeted Refresh (in lieu of Net Change Refresh) to bring over the latest picture of supply and demand to the planning server in cases when the incremental changes to supply and demand on the source instance since the last collection are very extensive. In this case, the update mechanism employed by Targeted Refresh collections (wholesale deletion followed by rebuilding of data on the planning server) is faster than the mechanism employed by Net Change Refresh collections (incremental insertions into existing data on the planning server).

## Methods

### Methods



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#### Methods

The Organization Specific method clears transaction data for only the user-selected business entities from the planning server for specific organizations, and then copies the entity information over from the transaction instances of specific organizations. You must specify the organizations for collection in a collection group. It works with any of the other collection methods—Complete Refresh, Targeted Refresh, and Net Change Refresh.

You should use Organization Specific Refresh when you use multiple supply chain plans in your enterprise against different organizations, for example, by business unit. This method reduces collections time as it is only collecting data for organizations that you will plan.

## Type

### Type



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#### Type

Standard collections process: Using the standard collections process, you can manually run three types of collection methods including a complete refresh, a net change refresh, or a targeted refresh on specific business entities.

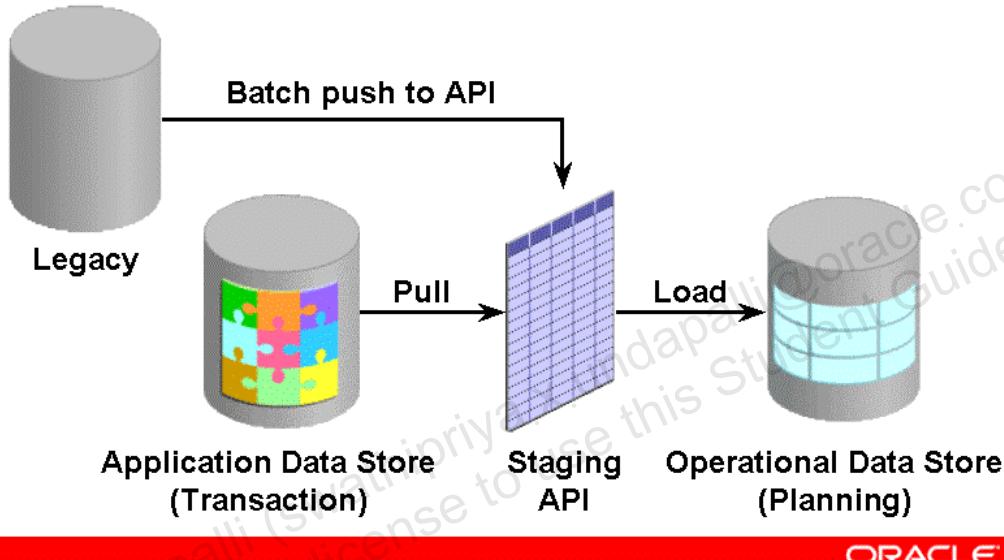
Continuous collections process: The continuous collections process is an automated process of data collection that efficiently synchronizes the data on the planning server by looking up the sources. If you opt for continuous collections, the system automatically determine the type of collection that needs to be run on entities selected by you. The continuous collections process collects data from the sources with the least user intervention. The Continuous Collections concurrent program performs continuous collections.

## Collections Processing

### Collections Processing

**User-transparent, two-stage, concurrent request set:**

- **Planning Data Pull**
- **Planning ODS (Operational Data Store) Load**



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### Collections Processing

The two-stage data collection process begins with the information being pulled or, in the case of legacy sources, pushed to a temporary staging table located on the APS destination. Data is consolidated in the staging table. A second program in the concurrent request set moves the data to an Operational Data Store (ODS), which is also located on the APS destination.

Data Collection Data collection consists of the following:

- Planning Data Pull program
  - Collects the data from the Application Data Store (ADS) and stores the data into the staging tables. This pull program is a registered Application Object Library (AOL) concurrent program that could be scheduled and launched by a system administrator.
  - If you are using legacy ERP applications, you must write your own pull program.
- Operational Data Store (ODS) Load program
  - A PL/SQL program which performs the data transform and moves the data from the staging tables to the ODS. This collection program is a registered AOL concurrent program that could be scheduled and launched by the system administrator.

When the information is in the staging tables, you can run your own custom data cleansing programs against it. This is more commonly done when you are collecting from multiple

instances. For example, one instance may use Oak St. and another instance uses oak st.; your data cleansing program makes all occurrences of this name in the staging tables the same.

## Collections Parameters

### Collections Parameters

#### Pull data program parameters:

- **Instance code**
- **Refresh or net change mode**
- **Analyze staging tables**
- **Data types**

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### Collections Parameters

The Complete Refresh flag works in conjunction with the other data Yes/No flags listed lower on this same form. The figure shows that this data pull will be performed in the complete refresh mode (Purge Previously Collected Data = Yes). When Purge Previously Collected Data 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 Purge Previously Collected Data is set to No, then the data collection is performed in targeted refresh mode or net change refresh mode. If you choose Targeted Refresh, 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.

If you choose Net Change Refresh mode, the collections process does not purge the existing data in the ODS. For the data types that have flags set to Yes,

Periodically set the Analyze Tables flag to Yes to maintain planning database performance. After data is collected, Analyze Tables flag set to Yes tunes the planning server database, providing faster access by the planning engine.

## Collections Parameters

### Collections Parameters

- **Load data program parameters:**
- **Number of Workers**
- **Recalculate NRA**
- **Recalculate Sourcing History**

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### Collections Parameters

Number of Workers is a setting that allocates processing resources to do the data load. The Number of Workers setting is typical of concurrent programs found throughout Oracle Applications.

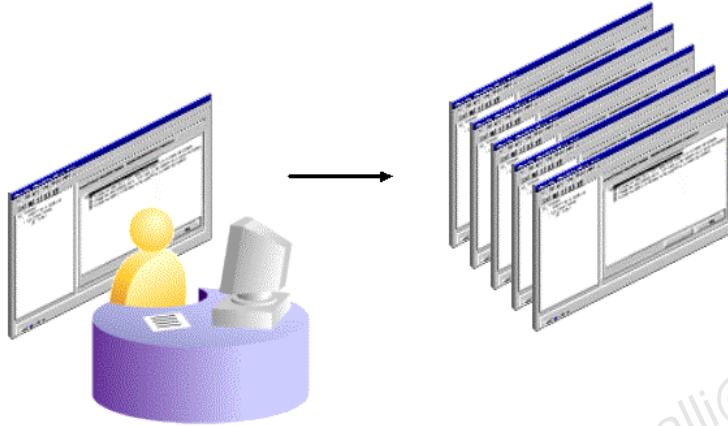
The Planning ODS Load program does not have parameters for data types. All collected data is moved from the staging table to the Operational Data Store.

Recalculate NRA: Availability over time for all resources is stored on the planning (destination) server in a net resource availability (NRA) table. When 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 recalculated.

Recalculate Sourcing History: If you base allocation of orders among external suppliers on sourcing history, setting the Recalculate Sourcing History flag to Yes will recalculate sourcing history.

## Collections Workbench

### Collections Workbench



- **View data**
- **Troubleshoot errors**
- **Enter data on the destination instance that can not be entered on the source instance**

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## Collections Workbench

You can use Collections Workbench to:

- Verify that the intended source data has been collected to the planning data store. It appears the same as Planner Workbench.
- Troubleshoot data collection errors: You may need to rerun the data collection program.
- Enter supplemental data: For example, in Oracle Applications release 11, there is no way to specify supplier capacity information. After the data is collected, navigate to a supplier in the left window pane of the Collection Workbench. Right click the supplier. In the right click menu, select Supplier Capacity. This will navigate to a blank Supplier Item Attributes window. On the Planning Constraints tab you can specify flexible supplier capacity on the planning data store. This supplemental constraint information is then available to planning.

## Quiz

### Quiz

**Which refresh method should you use the first time you perform collections from a source instance to the planning server?**

- 1. Net Change**
- 2. Complete**
- 3. Targeted**
- 4. None of the above**

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**Answer:** 2. Complete

## Quiz

### Quiz

**The continuous collections process is an automated process of data collection that efficiently synchronizes the data on the planning server by looking up the sources.**

- 1. True**
- 2. False**

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**Answer:** 1. True

## Topic Overview: Collection Exceptions

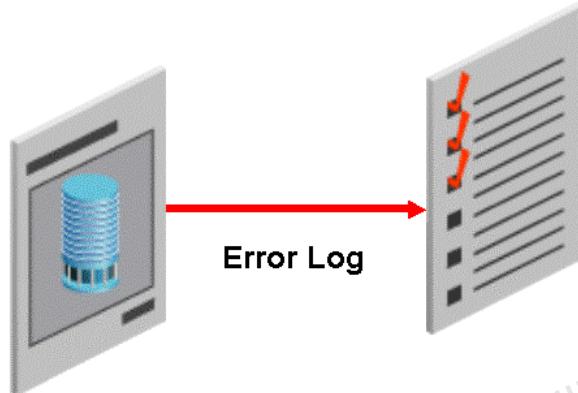
### Topic Overview: Collection Exceptions

- **Collection exceptions**
- **Audit Exceptions report**

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## Collection Exceptions

### Collection Exceptions



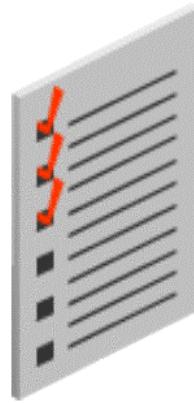
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### Collection Exceptions

The collections process reports any problems with its process in its log. Oracle recommends that someone from planning and someone from the technical department should review this information.

## Audit Exceptions Report

# Audit Exceptions Report



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### Audit Exceptions Report

The ASCP process involves collecting and using source data to drive planning. Data from source transaction instances need to be accurate and need to be set up properly in order for ASCP to render reliable planning output. Data from the source can be corrupt due to many reasons, including: bad transactions, missing transactions, human error, improper formats, conflicting and/or missing setups and profile options.

Oracle ASCP provides a tool to validate the data it uses in the planning process. The Audit Exceptions Report is a self-explanatory report that evaluates data setups for profile options that are incorrectly set, invalid package bodies and objects, invalid triggers, etc. It suggests remedies for the problems that are found.

Oracle recommends that someone from planning and someone from the technical department should review this information on a regular basis.

## Summary

### Summary

**In this module, you should have learned how to:**

- **Describe collections**
- **Describe collection exceptions**

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# **Analyzing Unconstrained Plans**

**Chapter 7**

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## Analyzing Unconstrained Plans

# Analyzing Unconstrained Plans

Advanced Supply Chain Planning Fundamentals

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## Objectives

### Objectives

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

- Describe exceptions
- Describe unconstrained exception messages
- Describe recommendations
- Analyze supply and demand
- Release recommendations

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## Module Overview: Topics

### Module Overview: Topics

- Exceptions
- Unconstrained exception messages
- Recommendations

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## Topic Overview: Exceptions

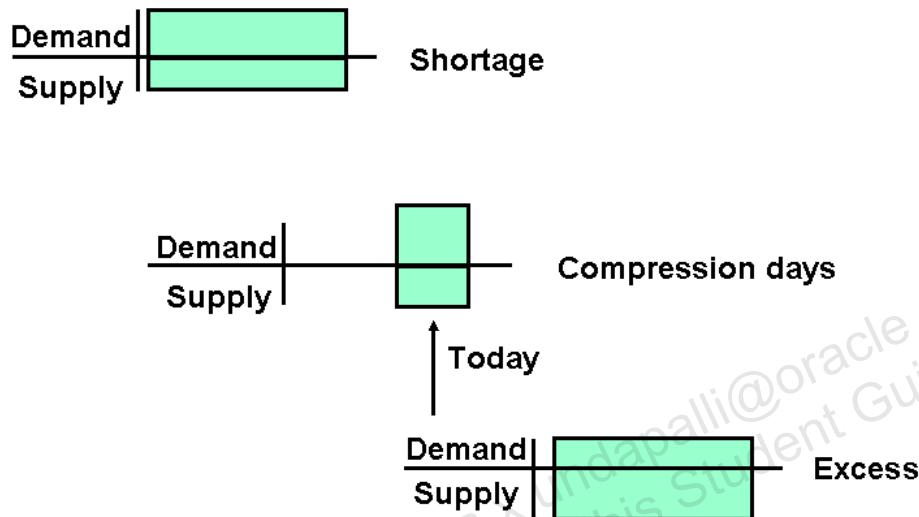
### Topic Overview: Exceptions

- Exception messages
- Exception messages and plan class
- Exception groups
- Exception context windows
- Exception sets
- Comparing exception messages
- Personal and public queries

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## Exception Messages

### Exception Messages



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### Exception Messages

The planning engine issues exception messages (exceptions) to:

- Alert you to a situation that may need your intervention, for example, a past due sales order
- Recommend that you perform an action, for example, change the date of a supply order

The planning engine issues certain exceptions for all plan types and others for only certain plan types.

## Exceptions Messages and Plan Class

### Exceptions Messages and Plan Class

- Unconstrained
- Resource constrained
- Supplier capacity constrained
- Purchasing lead-time constrained
- Optimized

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### Exception Messages and Plan Class

The plan class determines the exceptions that are generated.

The unconstrained and constrained options can be set for each planning time bucket. For example, a planner might want to use material and resource constraints for the first two weeks, material constraints only for the following 8 weeks, and no constraints for the long term (because he would be able to take the appropriate decisions early enough to ensure that the company would get the material and capacity needed).

#### Unconstrained

In this option, the system assumes infinite material availability and resource capacity while running plans. Statements of material availability and resource capacity are used to generate exceptions. Demand priorities are included during the planning run to determine the appropriate pegging relationships between supply and demand.

This option is most useful while generating plans for the long-term future or when no material or resource limitations apply. Unconstrained plans answer the question “ How much resource capacity and material availability is needed to satisfy all anticipated demand in a timely manner?” The exceptions that are generated point out where resource capacities and material availabilities (supplier capacities) must be adjusted. Long-term in this context is therefore

defined to be far enough into the future to take resource acquisition/disposition and supplier sourcing decisions to address the exceptions.

### **Resource Constrained**

In this option, all resource constraints such as available machine hours, transportation capacity, and alternate resources are considered. Alternate bill of materials are considered only when the optimized option is selected. Material constraints are only used to generate exceptions that are a result of lack of material availability.

This option, like the unconstrained option, is most useful for generating plans for the mid to long-term future. It answers the question “ How much material availability is needed to satisfy all anticipated demand in a timely manner?” It differs from the unconstrained option in a way that plans generated, respect resource capacity constraints but allow material availability constraints to be violated. The violations are tracked and result in exceptions that point out where material availability needs to be adjusted.

Planners would use this option, in lieu of the unconstrained option, in situations where it would be difficult to change resource capacity (for example, due to floor space constraints), but where increased outsourcing would be an option. Mid to long-term in the context of this option is defined to be far enough into the future to take supplier sourcing decisions to address the exceptions.

### **Supplier Capacity Constrained**

In this option, all material constraints that can be specified in the form of a supply schedule from manufacturing plants or by statements of vendor capacity from vendors are considered. When material availability is not a concern, resource availability constraints are used only to generate exceptions arising due to over-utilization or under-utilization of resources.

This option is similar to the resource constrained option, except that the roles of the material and the resource constraints are reversed. It is, most useful for generating plans for the long-term future, and answers the question, “How much resource capacity do I need to satisfy all anticipated demand in a timely manner?” It differs from the unconstrained option in a way that plans generated respect supplier capacity (material availability) constraints but allow resource capacity constraints to be violated. The violations are tracked and exceptions are generated to point out where resource capacities need to be adjusted. You would use this option in lieu of the unconstrained option in situations where it would be difficult to change material availability (for example, due to strategic partnering with fixed suppliers), but where internal resource acquisition/disposition would be an option. Long-term future in the context of this option is defined to be far enough into the future to take resource acquisition or disposition decisions to address the exceptions.

### **Purchasing Lead-Time Constrained**

In this option:

- If you select it, the planning engine enforces purchasing lead times for all items sourced from suppliers.
- If you clear it, the planning engine can violate purchasing lead time and issue an exception message when it does.

### **Optimized**

In this option, an optimized and executable plan is generated based on plan objectives, as well as material, resource, and transportation constraints. Plan objectives are the financial and other

enterprise strategic objectives such as maximize inventory turns, maximize plan profit, maximize on-time delivery, and so on. Multiple optimization objectives can be met by assigning weights to each objective using the Optimization tab.

This option, like material and resource constrained, is most useful for near-term plans that must respect all constraints to generate a feasible supply chain plan because, there is not enough time to overcome material and resource constraints. In addition, the quality of the planning solution is improved, compared to material and resource constrained plans, because more parameters and alternates are considered.

Technically, linear programming is used to optimize the user-defined plan objectives while generating planned orders. Linear programming translates into evaluating all feasible options to calculate an optimal plan.

## Exception Groups

### Exception Groups

Late sales orders and forecasts
Supply problems for late sales orders and forecasts
Material and resource capacity
Transportation and distribution
Shortages and excess
Reschedules
Substitutes and alternates used
Projects/tasks
Item exceptions

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### Exception Groups

Oracle Advanced Planning and Scheduling displays exception messages by exception group.

An exception group is a group of exception messages that deal with a common issue:

- **Late sales orders and forecasts:** Demand in danger of being late
- **Supply problems for late sales orders and forecasts:** Requirements and orders causing late demands
- **Material and resource capacity:** Overloaded supplier and manufacturing capacities
- **Transportation and distribution:** Overloaded transportation capacity
- **Shortages and excess:** Items out of balance
- **Reschedules:** Scheduled receipt adjustments
- **Substitutes and alternates used:** Notification of substitute components, alternate resources, and end item substitution
- **Projects/tasks:** Projects out of balance
- **Item exceptions:** Other item issues

## Exception Context Windows

### Exception Context Windows

- Exception summary
- Exception details

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## Exceptions Context Windows

### Exceptions Summary

The Planner workbench context window Exception Summary displays summary exception message information:

- Generated by the current planning run
- Saved from previous simulation runs

It displays the following information:

- **Action Type:** The exception group
- Version
- **Count:** The exception message count by exception group

The window orders the exception groups by their relative importance to troubleshooting; for example, late orders are more important than recommendations.

If you double-click on an exception group, you can see the exception messages that the planning engine issued for the plan. If you double-click on an exception message, you see Planner Workbench context window Exceptions Details; it shows each individual exception message.

Different enterprises have different volumes of exception messages from their plan. The volume that you receive depends on a number of factors:

- The number of items and complexity of the bills and routings that you have to plan
- The amount of mismatch between supply capabilities and demand needs
- Your exception message sensitivity settings

Even if there seem to be many exception messages, each planner can use Planner Workbench personal queries to get to the most important exceptions.

### **Exception Details**

Planner Workbench context window Exception Details displays information about each exception. If you select one exception type, the window displays information in a folder for that exception type. If you select multiple exception types, the window displays the generic default folder.

On the Exception Details window, you can obtain additional information about certain exceptions by:

- Highlighting exception messages and clicking buttons on the bottom
- Right-clicking the exception message

The buttons and menu choices that are available are unique to the exception.

## Exception Management

### Exception Management

- Option to prioritize and sort exceptions based on their preferences using the Find window
- Drill down to the Exception Details window to view an individual exception by double clicking on any exception group

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### Exception Management

The Planner Workbench supports various ways to assist planners in managing plan exceptions. They can manage exceptions and drill-down to details using:

- Exceptions prioritization and sorting
- Default exceptions folders
- Relevant information buttons
- Right mouse options
- Drilldown from Late Orders Exceptions to Constraint Exceptions (and vice versa)

### Exceptions Prioritization and Sorting

You can query exceptions for sorting and grouping using the Find window at the Exception Summary level.

### Personal Queries

You can create your own queries against the exceptions so that you can see only the exceptions that you need to.

## **Default Exception Folders**

When drilling down to the Exception Details window, the window will automatically open the correct (pre-seeded) default folder based on the exception you select. If you multi-select different exceptions, you will see the generic default folder.

Planners can customize their exception folder based on their preferences and save it as the default.

## **Relevant Information Buttons**

On the Exception Details window, additional information about the exception can be obtained through clicking the buttons on the bottom of the window. The type of exception will determine what buttons are available.

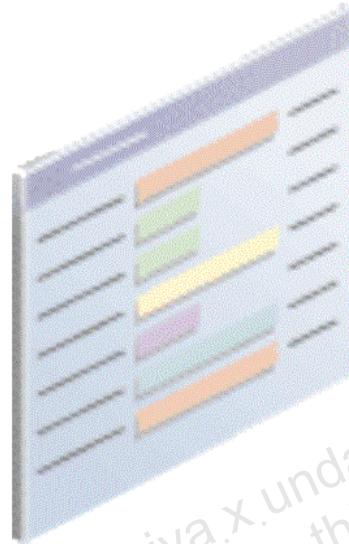
## **Right Mouse Options**

From the Exception Details window, planners can obtain more information through a right mouse click on the exception. The type of right mouse options users have is determined by the exception that is selected. Options included are:

- Supply
- Demand
- Resource Availability
- Resource Requirements
- Sources
- Destinations
- Related Exceptions
- Gantt Chart
- Horizontal Plan
- Vertical Plan

## Exception Sets

### Exception Sets



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#### Exception Sets

Use planning exception sets in the source instance to specify sensitivity controls and exception time periods for exceptions.

The fields in the exception set are not item and resource attributes but they act as if they are. Define as many planning exception sets as you need for your different types of items and resources (use the Planning Exception Sets form). Then, assign exception sets to items and resources.

The planning engine only issues exceptions against items and resources that have exception sets assigned to them.

## Comparing Exception Messages

### Comparing Exception Messages

Multiple plan names can be selected in the tree navigator to compare the exception messages generated.

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### Comparing Plan Exceptions

The ability to rapidly run online interactive simulations in memory and then quantitatively assess the quality of the different planning scenarios gives planners an extremely powerful decision-support tool.

#### Multiple Plan Exception Comparisons

- Select multiple plan scenarios in the tree navigator on the left side of the screen.
- Select the Actions tab on the bottom of the right side of the screen.
- View a comparison of the exception messages:
  - View details of actions.
  - Navigate to the Supply/Demand window.

## Quiz

### Quiz

Which plan class would you use to answer the question “How much resource capacity and material availability is needed to satisfy all anticipated demand in a timely manner?”

1. Unconstrained
2. Resource constrained
3. Supplier capacity constrained
4. Purchasing lead-time constrained

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**Answer:** 1. Unconstrained

## Topic Overview: Unconstrained Exception Messages

### Topic Overview: Unconstrained Exception Messages

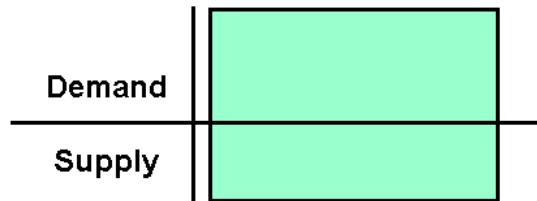
- Items with a shortage exception message
- Orders with compression days exception message
- Resource overloaded exception message
- Supplier capacity overloaded exception message

These are the most frequently seen unconstrained exception messages. Since these exception messages occur in unconstrained plans, it is up to the planner to fix them.

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## Items With a Shortage Exception Message

### Items With a Shortage Exception Message



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### Items With a Shortage Exception Message

Exception message Items with a shortage is in exception group Shortage and excess.

This exception message appears when projected available balance for a planning bucket is negative and is within the exception set Shortage Exceptions exception time period. Projected available balance is Previous bucket projected available balance + Sum of supply quantities with due date in this planning time bucket - Sum of demand quantities with due date in this planning time bucket.

The planning engine can peg late supplies to demands at any level in the supply chain. Therefore, you can see item shortages in several levels of the supply chain bill of material.

The information displayed for this exception message is:

- Organization
- Item
- Item Description
- **Quantity:** Projected available balance
- **From Date:** The start date of the planning time bucket in which the negative projected available balance occurs.

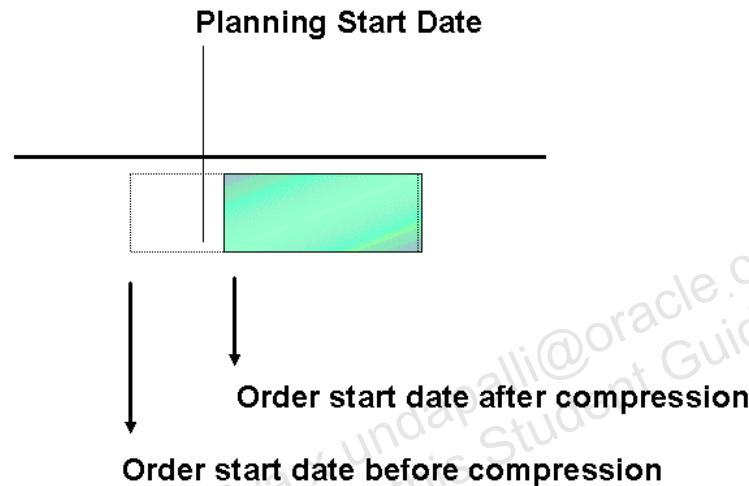
- **To Date:** The start date of the last planning time bucket in which the negative projected available balance occurs. As long as Quantity remains the same in successive planning time buckets, the planning engine uses the same exception and extends the To Date.

To resolve this exception message:

- Expediting the late supply
- Adjusting the sales order schedule date

## Orders With Compression Days Exception Message

### Orders With Compression Days Exception Message



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### Orders With Compression Days Exception Message

Exception message Orders with compression days is in exception group Reschedules.

This exception message appears when the planning engine detects that a supply order needs to be completed in less time than its minimum processing time in order for it to meet a demand. If the planning engine plans the order according to its lead time, it would start in the past (before the planning horizon start date). The compression days represents all of the following:

- The number of days of work that you need to make up on the order to respect its due date.
- The number of days that the order would be scheduled in the past (before the planning horizon start date).
- The number of days that the order needs to be compressed if its start date is the planning horizon start date.

To calculate compression days, the planning engine:

- Uses the organization's manufacturing calendar
- Backward schedules orders using item lead time offset (for unconstrained plans) or routing level processing times (for constrained plans)
- Finds the number of days between the order (start) date and the planning horizon start date.

A supply order with compression days at a higher level of the supply chain bill of material leads to supply orders with compression days at lower levels of the supply chain bill of material. The planning engine calculates the lower level compression days by setting sets each lower level dependent demand due on the planning horizon start date and backward schedules its supply order from that date. The compression days for each supply order represents the amount of compression time needed for that order alone.

The planning engine may compress existing supplies that need to be rescheduled in and planned orders if there is not enough time between the planning horizon start date and the demand date.

For constrained plans, this exception message is replaced by exception messages Order with insufficient lead time and Requirement with insufficient lead time. However, you can set profile option MSO: Generate Compression Days Exception to instruct the planning engine to display this exception message for constrained plans.

The information displayed for this exception message is:

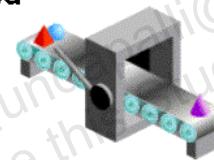
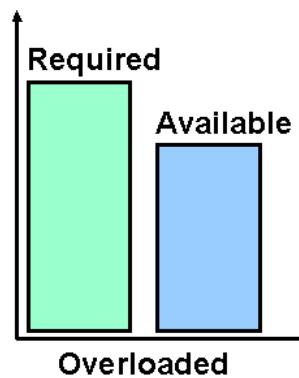
- Organization
- Item
- Order number
- Date: The due date
- Quantity
- Compression days

To resolve this exception message:

- Consider changing the demand due date to a later date. The planning engine continues to plan as if you accept the suggestion.
- If the exception occurs on a transfer order, use the Supply/Demand window for visibility into the destination organization. You can take action either at the source or destination organization.

## Resource Overloaded Exception Message

### Resource Overloaded Exception Message



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### Resource Overloaded Exception Message

Exception message Resource overloaded is in exception group Material and Resource capacity.

This exception message appears when, in a planning time bucket, both:

- The resource required capacity is more than the resource available capacity
- The load ratio is more than the exception set Over-utilization (if you have assigned the resource to an exception set)
- The amount of overload is the minimum duration of the operation for the maximum assigned units of the routing. Load ratio is a percent and its calculation is  $(\text{Required Capacity}/\text{Available Capacity}) * 100$ .

The information displayed for this exception message is:

- Organization
- Resource
- Dept/Line
- **Start Constraint Date:** The start date of the planning time bucket in which the resource is overloaded

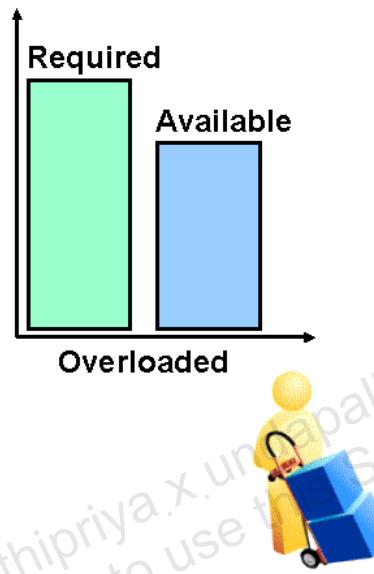
- **End Constraint Date:** The start date of the last planning time bucket in which the resource is overloaded. As long as Load Ratio remains the same in successive planning time buckets, the planning engine uses the same exception and extends the End Constraint Date.
- Load Ratio

To resolve this exception message, consider:

- Adjusting sales order line schedule date
- Increasing your resource availability:
  - Increase hours available per unit (overtime)
  - Increase the resource assigned units
  - Increase work days (overtime)
  - Changing shift pattern
- Changing resource usage:
  - Using an alternate resource
  - Using an alternate routing
  - Modifying the sourcing rules
  - Subcontracting
  - Using substitute items (with different resources)
- Adjusting the exception set Over-utilization

## Supplier Capacity Overloaded Exception Message

### Supplier Capacity Overloaded Exception Message



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### Supplier Capacity Overloaded Exception Message

Exception message Supplier capacity overloaded is in exception group Material and resource capacity.

This exception message appears when, in a planning time bucket, the supplier required capacity is more than the supplier available capacity.

The amount of overload is Required capacity - Cumulative available capacity of that bucket. Load ratio is a percent and its calculation is  $(\text{Required Quantity}/\text{Cumulative Available Quantity}) * 100$ .

Since supplier capacity is global, the planning engine issues these exceptions to the plan owning organization.

Since unconstrained plans assume infinite capacity, the planning engine may issue many instances of this exception. If profile option MSC: Enable Enhanced Sourcing is Yes, unconstrained plans first exhaust supplier capacity from rank 1 suppliers and then use supplier capacity from rank 2 suppliers.

The information displayed for this exception message is:

- **Organization:** The owning organization
- Item

- **From Date:** The start date of the planning time bucket in which the supplier capacity is overloaded
- **To Date:** The start date of the last planning time bucket in which the supplier capacity is overloaded. As long as Load Ratio remains the same in successive planning time buckets, the planning engine uses the same exception and extends the To Date.
- Supplier
- Supplier Site
- **Load Ratio:** The planning engine does not carry supplier capacity overloads from one planning time bucket to the next.

To resolve this exception:

- Check to see if these exceptions cause Late replenishment for sales order or Late replenishment for forecast exception messages; right click the exception message and select Related Exceptions.
- In the Planner Workbench, Exception Details window, sort the Late replenishment for sales order and Late replenishment for forecast exception messages by your priority, for example, days late or demand priority.
- Check to see if a resource capacity issue caused early processing of the supply order resulted in the material constraint.
- Consider:
  - Adjusting sales order line schedule date
  - Adjusting forecast entry date
  - Adjusting supplier capacity
  - Using an alternate supplier
  - Using a substitute component: In unconstrained plans, make a manual substitution.
  - Arranging and recording new substitute items
  - Increasing supplier flexfences
  - Changing the sales order or forecast quantity
  - Modifying the sourcing rule: For example, change sourcing percentage
  - Changing lead time
  - Adjusting the exception set Over-utilization

## Quiz

### Quiz

What type of exception message is generated when the supplier required capacity is more than the supplier available capacity in a planning time bucket?

1. Items With a Shortage
2. Orders with Compression Days
3. Resource Overloaded
4. Supplier Capacity Overloaded

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**Answer:** 4. Supplier Capacity Overloaded

## Quiz

### Quiz

What type of exception message appears when a supply order needs to be completed in less time than its minimum processing time in order for it to meet a demand?

1. Items With a Shortage
2. Orders with Compression Days
3. Resource Overloaded
4. Supplier Capacity Overloaded

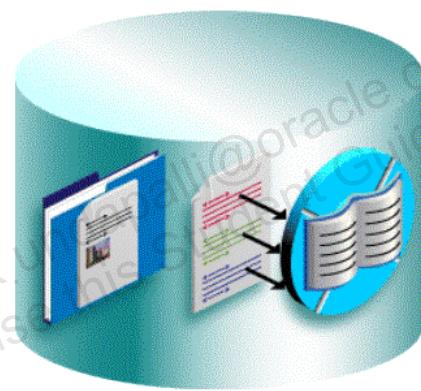
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**Answer:** 2. Orders with Compression Days

## Topic Overview: Reports

### Topic Overview: Reports

- Oracle Supply Chain Planning Detail Report
- OPM MPS Enhanced Material Activity Report
- OPM MPS Enhanced Bucketed Material Report
- Oracle Inventory Reorder Point Report
- ASCP Planning Detail Report



## Oracle Supply Chain Planning Detail Report

### Oracle Supply Chain Planning Detail Report

- A comprehensive planning report to understand the material plan
- Includes the following sections:
  - Horizontal Listing
  - Vertical Listing
  - Detail sections showing
    - Gross requirements
    - Scheduled receipts
    - Planned orders
    - Bill of material and engineering changes
    - Expired lots, and
    - Byproduct information

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### Oracle Supply Chain Planning Detail Report

The Oracle Supply Chain Planning Detail Report is a comprehensive planning report that gives you information you need to understand the material requirements planning data for a plan name that you specify. This report is available to OPM customers.

The report is created against ASCP Plan data. You can also generate this plan based on the collected Operational Data Store (ODS) data

The report includes the following sections: Horizontal Listing, Vertical Listing, and detail sections showing gross requirements, scheduled receipts, planned orders, bill of material and engineering changes, expired lot and byproduct information.

This report replaces the following OPM MRP reports:

- MRP Bucketed Material Report
- MRP Material Activity Report
- MRP Action Messages Report
- MRP Error Messages Report

You can run this report for a specific plan or based on Operational Data Store (ODS) data.

- **Plan Name:** Selecting the value “Collections” for the Plan Name field allows you to create the Planning Detail Report based on the ODS data.

- **Detail Display:** Select one of the following options:
  - Yes – Display vertical and horizontal listings and detail sections: gross requirements, scheduled receipts, planned orders, bill of material and engineering changes, repetitive schedules, substitute items, reservation details, and byproduct information.
  - No – Display vertical and horizontal listings only.

**Parameters** - You can create this report for a specific or a range of planning groups, projects, and tasks. In addition, you can select one of the following options to display this report at different granularity:

- Item-Org
- Item-Org-Planning Group
- Item-Org-Project
- Item-Org-Project-Task

You can summarize your report from a lower granularity level to a higher granularity level based on the plan output.

For example, if the plan output is at the Item-Org-Project level, then you can summarize the plan output to show the report at the Item-Org-Planning Group level. In this example, selecting the Item-Org-Project-Task as the Display Level will result in a blank report.

## OPM MPS Enhanced Material Activity Report

### OPM MPS Enhanced Material Activity Report

- A revised OPM report against source transaction data
- Lists (in chronological order):
  - Pending inventory transaction activity for an item in a specific warehouse, or
  - All warehouses over which the planner has authority
- Helps buyers decide which requisitions and suggested purchases should be approved
- Helps planners decide when to convert firm-planned orders to batches
- Indicates when batches should be rescheduled, consolidated, or canceled

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### MPS Material Activity Report

The MPS Material Activity Report is created in a new format against source transaction data for a given Schedule.

The planning schedule includes a list of the items, manufacturing plants, and warehouses of interest. You define schedule parameters in the OPM Master Production Schedule (MPS) application. You then link the schedule parameters to yourself and other planners, and to the inventory items for which you have scheduling interests.

You can also link one or more sales forecasts to each schedule. This procedure determines which forecasts are visible to that schedule, and allows you to include numerous sales forecasts in MPS or MRP reports created for a schedule.

This report lists, in chronological order, pending inventory transaction activity for an item in a specific warehouse, or all warehouses over which the planner has authority. Pending inventory transactions include sales orders, purchase orders, firm-planned orders, or any other that has an anticipated effect on stock balances. This is in contrast to an actual, completed stock transaction, such as a move of inventory between warehouses. By listing anticipated consumption against receipts, such as purchase receipts and planned order receipts, production and purchasing planners can view the effects of pending transactions on inventory balances.

For buyer-planners, this report can help decide which requisitions and MRP-suggested purchases should be approved. The report may also indicate situations where smaller purchases can be grouped into a single, large purchase, possibly allowing the buyer to receive a volume discount. The report helps production planners decide when to convert firm-planned orders to batches. It may also indicate when batches should be rescheduled, resized, consolidated, or canceled.

## Parameters

**Organization** - This field displays the default organization assigned to the planner. If the planner has planning interests in more than one organization, the planner can override this default with another organization code that has been linked to the planner on the User Organization window in the System application.

**Schedule** - The default schedule parameters code assigned to the current user displays, along with the corresponding schedule parameters description. The planner can enter a different schedule parameters code, as necessary.

The organization code and the schedule parameters code are both required to identify the schedule parameters that were used to generate the MRP run for which you are inquiring on material activity.

**Planning Class** – Enter the code of the planning class associated to the schedule for which you ran MRP.

**Buyer/Planner** – Enter the code of the buyer or planner associated to the schedule for which you ran MRP.

**Item** – Enter the item code of the item (product) for which you want to review material activity. Required.

**For Organization** – A schedule can have multiple organizations linked to it., enter the specific organization for which you want to see MPS Material Activity.

**Warehouse** – Enter the warehouse in which the item on which you are inquiring is stocked. Note that the warehouse description

**Critical Item** – Select this box if you want to flag critical items.

## Note:

- You must associate a Planning Class to your user and to each item you wish to have print on a report. If no associations are made, the reports will not print any data.
- The SCP vertical report is based on plan data, while the MPS Material Activity Report is based on source transaction data for a given Schedule.

## OPM MPS Enhanced Bucketed Material Report

### OPM MPS Enhanced Bucketed Material Report

- A revised OPM report against source transaction data
- Lists pending transaction information for a single item in one or more warehouses in specified time buckets
- Groups transactions into categories such as purchase order receipts and planned production
- Time bucket-based format

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#### MPS Bucketed Material Report

The MPS Bucketed Material Report is created in a new format against source transaction data for a given Schedule:

Like the MPS Material Activity report, this report lists pending transaction information for a single item in one or more warehouses. However, the previous report listed individual pending transactions for the item in chronological order.

The MPS Bucketed Material report shows aggregate supply and demand information for the item, grouped into categories (such as purchase order receipts and planned production). The aggregate supply and demand for the item in each category is listed, rather than the individual transactions. For example, if you plan for an item used in 50 formulas and in 30 batches per day, the Bucketed Material Report can show you the total demand for the item by day, by week, and so forth.

While the MPS Material Activity report lists transactions in chronological order, the MPS Bucketed Material report is generated on a time bucket-based format. OPM lists all pending supply and demand for an item, aggregated by day, week, or whatever bucket size defined on your schedule. OPM can thereby list net safety stock requirements for any point in time.

The time buckets are established for the schedule on the MPS Schedule window. OPM compiles all sources of supply and demand in the time buckets.

## Parameters

See the MPS Material Activity Report.

### Note:

- You must associate a Planning Class to your user and to each item you wish to have print on a report. If no associations are made, the reports will not print any data.
- The SCP horizontal report is based on a plan data while the MPS Bucketed Material Report is based on source transaction data for a given Schedule.

## Oracle Inventory Reorder Point Report

### Oracle Inventory Reorder Point Report

An existing report replacing OPM Reorder Point Report

- Suggests a new order for an item when the available quantity—on-hand quantity plus planned receipts—drops below the item's safety stock level plus forecast demand for the item during its replenishment lead time.
- Improves overall customer service by reducing stock-out probability.

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### Oracle Inventory Reorder Point Report

You can run this report for “All reorder point planned items” or “Item under reorder point”.

Reorder point planning uses demand forecasts to decide when to order a new quantity. Reorder point planning suggests a new order for an item when the available quantity (on-hand quantity plus planned receipts) drops below the item's reorder point (safety stock level plus forecast demand for the item during its replenishment lead time).

The suggested economic order quantity minimizes the total of ordering and inventory carrying costs. Oracle Inventory can automatically generate requisitions to inform your purchasing department that a replenishment order is required.

Reorder Point = Safety Stock + Forecast demand during the lead time (LT)

Order lead time = Preprocessing LT + processing LT + post processing LT

**Item Selection** - “All reorder point planned items” or “Item under reorder point”.

#### Cutoff Date Parameters

- Demand Cutoff Date – Enter the demand cutoff date. The report considers only demand with dates equal to or earlier than the demand cutoff date.
- Supply Cutoff Date – Enter the supply cutoff date. The report considers only supply with expected receipt dates equal to or earlier than the cutoff date.

**Restock** - Select Yes or No to indicate whether you want to create demand records in the interface tables for requisitions and WIP jobs. You can enter a value here only if you are defined as an employee.

For more information on this report see *Oracle Inventory User's Guide*.

To create the requisitions and discrete jobs, run the import processes. See:

- “Requisition Import Process,” *Oracle Purchasing User’s Guide*
- “Importing Jobs and Schedules,” *Oracle Work in Processing User’s Guide*.

## ASCP Planning Detail Report

### ASCP Planning Detail Report

OPM users now have access to this existing report by virtue of the merging of OPM MRP into ASCP.

- This report requires Oracle Discoverer
- For a given supply chain plan, the report includes the relevant details about items, resources, gross requirements, scheduled receipts, planned orders, plan constraints, and exceptions in separate worksheets
- The report gives detailed information to help you understand and analyze the supply chain planning results by presenting the data selectively and coherently

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### ASCP Planning Detail Report

The ASCP Planning Detail Report provides a simple, consolidated report that shows the output of the advanced supply chain planning process. The report gives detailed information to help you understand and analyze the supply chain planning results by presenting the data selectively and coherently. For a given Supply Chain Plan, the report includes in separate worksheets the relevant details about items, resources, gross requirements, scheduled receipts, planned orders, plan constraints, and exceptions.

You can select the plan, organizations, items, resources, projects, and many other parameters to filter the information to display in the report, and you can change these parameters at any time.

#### Parameters

- **Plan Name:** Select a plan.
- **Org:** Select the owning organization and multiple organizations for a multi-org plan. For a single-org plan, or when not working in the owning organization, only the current organization can be selected.
- **Category Set:** At least one category set should be selected. The default is the category set used for the plan. You can select another category set.
- **ABC Class:** Select a range of item ABC classes

- Item – Select a range of Items.
- Planner – Select the name of a planner
- Buyer – Select the name of a buyer
- Supplier – Select one or more suppliers
- Planning Group – Select the planning groups
- Project – Select the projects
- Resource Group – Select resource groups
- Dept./Line – Select the departments/lines
- Resource – Select a range of resources

## Quiz

### Quiz

Which report is used to understand the material plan?

1. ASCP Planning Detail Report
2. Oracle Inventory Reorder Point Report
3. Oracle Supply Chain Planning Detail Report
4. OPM MPS Enhanced Material Activity Report

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**Answer:** 3. Oracle Supply Chain Planning Detail Report

## Quiz

### Quiz

Which report lists pending transaction information for a single item in one or more warehouses ASCP Planning Detail Report?

1. Oracle Inventory Reorder Point Report
2. Oracle Supply Chain Planning Detail Report
3. OPM MPS Enhanced Material Activity Report
4. OPM MPS Enhanced Bucketed Material Report

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**Answer:** 4. OPM MPS Enhanced Bucketed Material Report

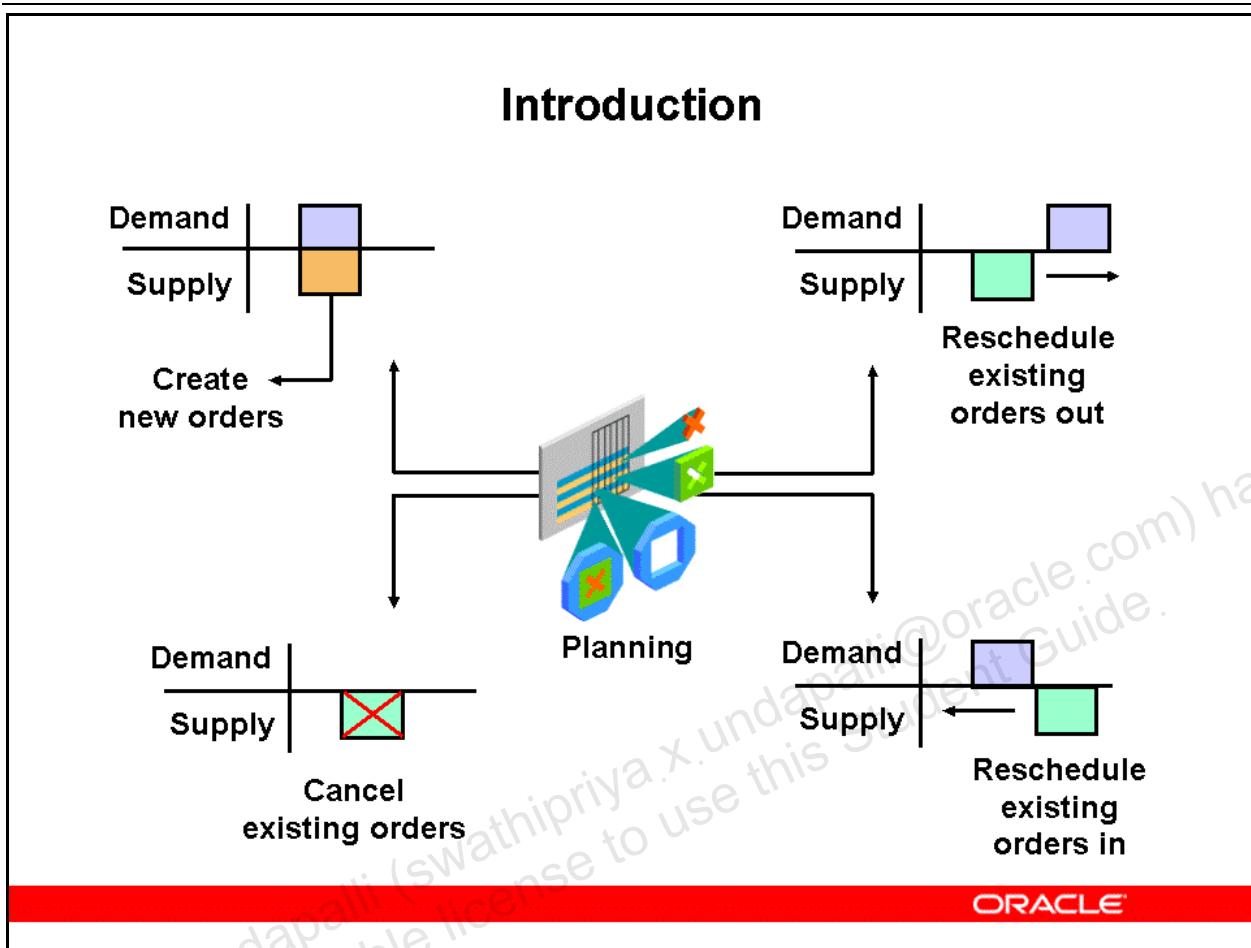
## Topic Overview: Recommendations

### Topic Overview: Recommendations

- Introduction
- Reschedules exception messages
- Orders to be rescheduled out exception message
- Viewing recommendations
- Make item
- Buy item
- Transfer item
- Firm planned orders
- Releasing recommendations

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## Introduction



### Introduction

A recommendation is a suggestion to the planner to take an action that results in the balancing of supply and demand. Recommendations appear in the Recommendations exception group and suggest that you:

Release a planned order to purchasing or to the shop floor. A planned order is a suggestion by the planning engine that you order some new supply from the transaction system. The planned orders become:

- **Batches:** Oracle Process Manufacturing
- **Discrete jobs:** Oracle Work in Process
- **Flow schedules:** Oracle Flow Manufacturing
- **Jobs:** Oracle Project Manufacturing, Oracle Shopfloor Management (OSFM)
- **Purchase requisitions:** Oracle Purchasing

Reschedule or cancel a scheduled receipt. A scheduled receipt is a supply that is in process. The recommendations are in the Recommendations exception group and are against:

- Batches
- Discrete jobs

- Flow schedules
- Jobs
- Purchase requisitions

## Reschedules Exception Messages

### Reschedules Exception Messages

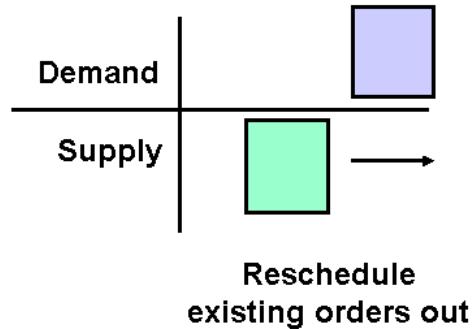
Exception messages that refer to recommendations:

- Past due orders
- Orders to be rescheduled out
- Orders to be cancelled
- Orders to be rescheduled in
- Orders with compression days
- Orders scheduled to next inventory point
- Order is firmed late
- Requirement is firmed late
- Order is firmed early
- Requirement is firmed early
- Shared supply scheduled late

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## Orders To Be Rescheduled Out Exception Message

### Orders To Be Rescheduled Out Exception Message



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### Orders To Be Rescheduled Out Exception Message

Exception message orders to be rescheduled out is in exception group Reschedules.

This exception message appears when the planning engine suggests that you reschedule an existing supply order (scheduled receipt) to a later date to avoid carrying excess inventory. It occurs when the planning engine detects a non-firm existing supply order with a due date that is earlier than it suggests (suggested due date).

The planning engine does not issue this recommendation for firm existing supply orders.

The planning engine continues to plan lower bill of material levels as if you accept the suggestion.

The information displayed for this exception message is:

- Organization
- Item
- Order Number
- **From Date:** The current due date
- **To Date:** The suggested due date
- Quantity

To resolve this exception message, consider reviewing the recommendations for the item and then rescheduling the order out. The planning engine continues to plan lower level bills of material as if you accept the suggestion.

## Viewing Recommendations

### Viewing Recommendations

- Exceptions
- Supply/demand

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### Viewing Recommendations

You see the recommendations in the Planner Workbench:

- Exceptions windows
- Supply/Demand window

To release recommendations, you must use the Supply/Demand window.

Oracle recommends that you analyze the recommendations in the exceptions windows and then drill down to the Supply/Demand window to conduct more detailed research on them and to release them.

## Make Item

### Make Item



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#### Make Item

A make item is an item that you manufacture in your facility.

The transaction system produces a make item in a:

- Discrete job (work order) under the control of Oracle Work in Process and Oracle Manufacturing Scheduling
- Flow schedule under the control of Oracle Flow Manufacturing

When you release a planned order for a make item, it becomes a discrete job or a flow schedule.

## Buy Item

### Buy Item



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#### Buy Item

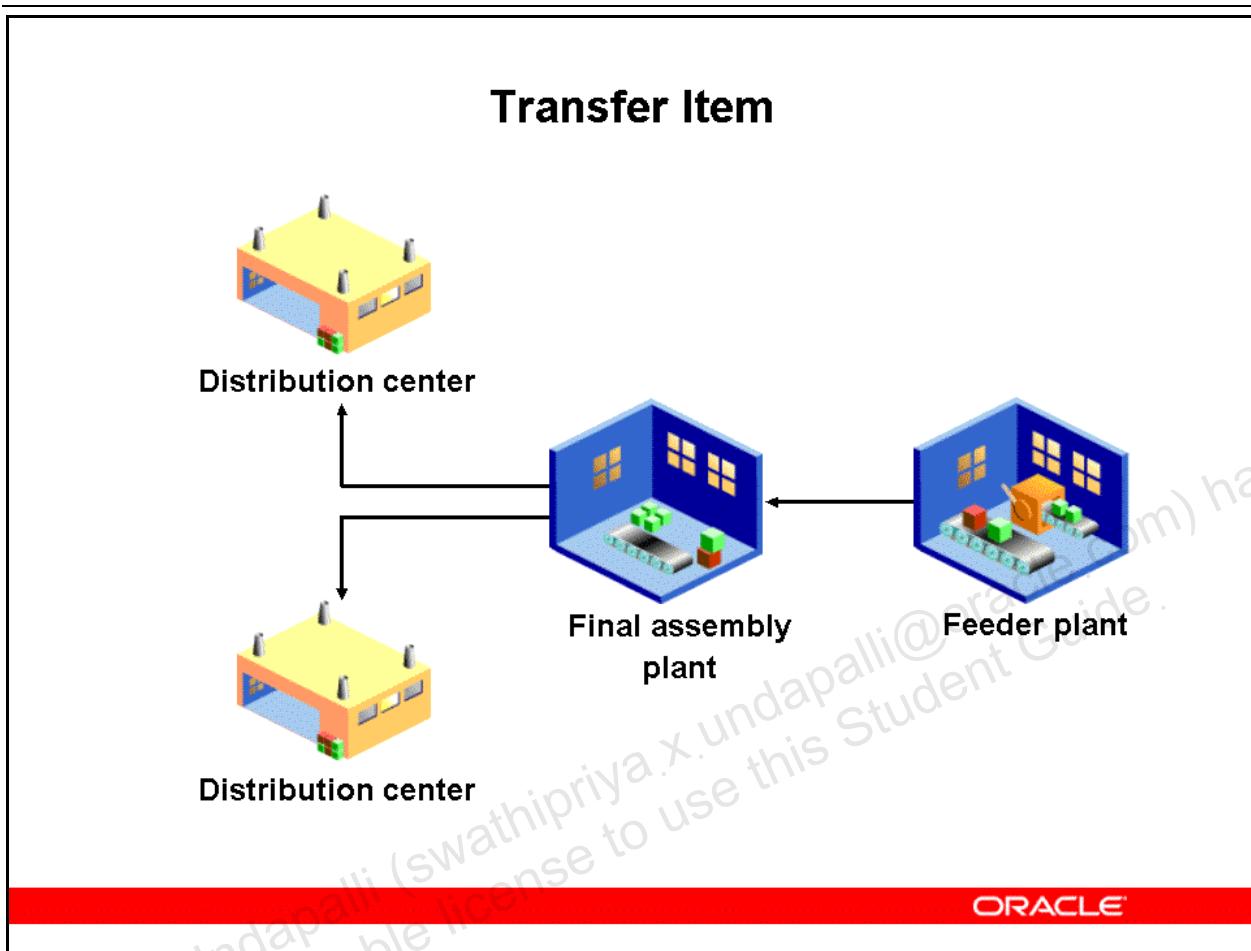
A buy item is an item that you purchase from another company and receive into your facility.

The transaction system orders and receives a buy item in a purchase order under the control of Oracle Purchasing.

When you release a planned order for a buy item, it becomes a purchase requisition--a request to buy. Other processes place the purchase requisition on a purchase order.

The planning engine does not look for (explode a bill of material for) components of buy items.

## Transfer Item



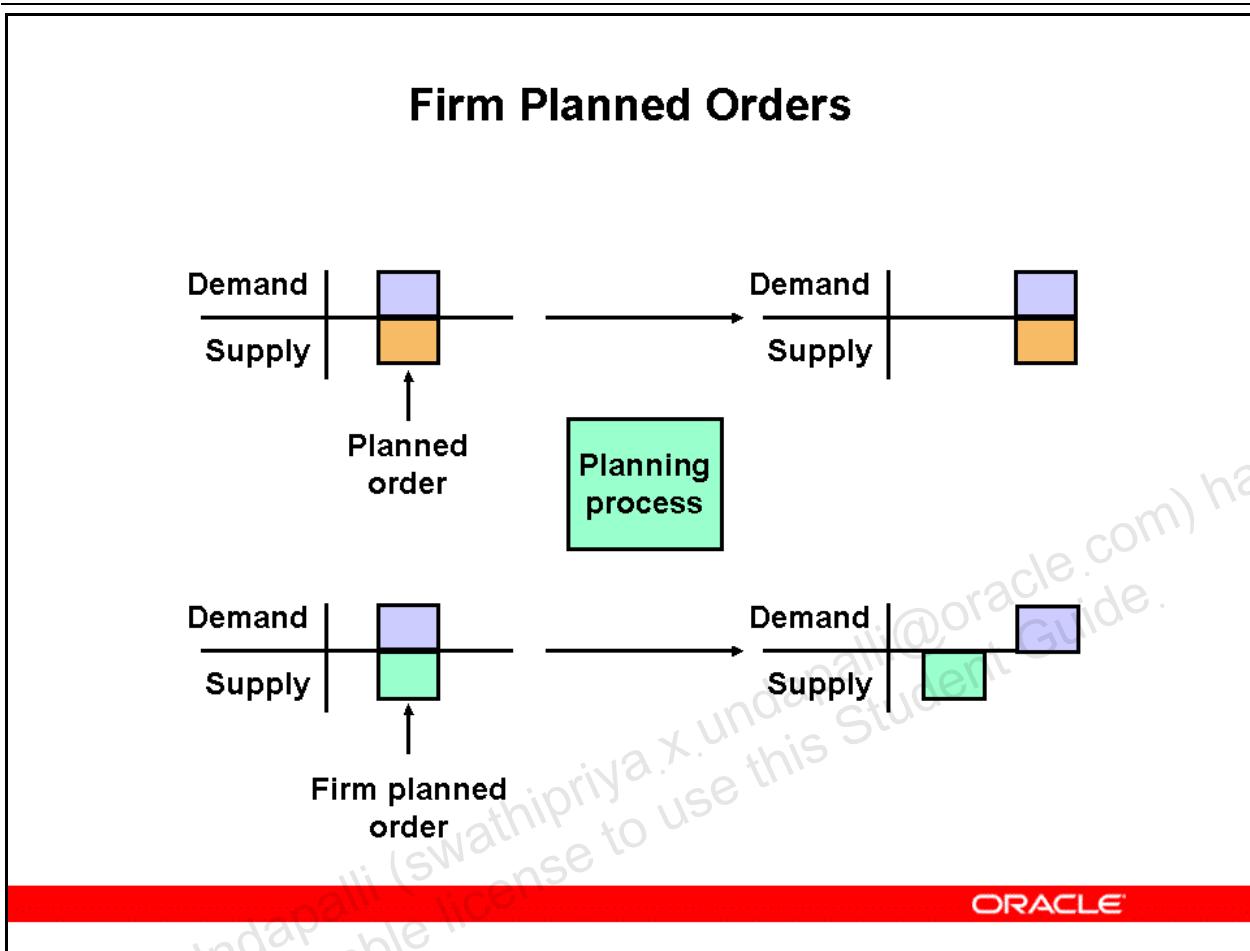
### Transfer Item

A transfer item is an item that you receive into your facility from another facility of your company.

The transaction system orders and receives a transfer item in an internal purchase requisition under the control of Oracle Purchasing.

When you release a planned order for a transfer item, it becomes an internal purchase requisition--a request to transfer. Internal purchase requisitions are not subject to placement on purchase orders. Processes place the internal purchase requisition on an internal sales order at the transferring plant under the control of Oracle Order Management.

## Firm Planned Orders



### Firm Planned Orders

A firm planned order is a planned order that you have not released but have marked so that the next planning run will not change it.

## Releasing Recommendations

### Releasing Recommendations

- Org
- Item
- For Release
- Firm
- Order Type
- Suggested Due Date
- Orig. Qty
- Order Number
- Action : Recommendation
- New Date
- New Qty

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### Releasing Recommendations

The Supply/Demand window has the following columns in the Order tab:

- **Org:** Organization
- **Item:** Item name
- **For Release:** Checkbox for release
- **Firm:** Checkbox for firm
- **Order Type:** Manual MDS, Sales Order, Planned Order, so on
- **Suggested Due Date:** Planning suggested due date
- **Orig. Qty:** Original demand quantity
- **Order Number:** MDS name, Planned order number, and so on
- **Action:** Recommendation: None or Release
- **New Date:** If you firm the order, you could change to a new firm date
- **New Qty:** If you firm the order, you could change to a new firm quantity

Additional columns can be displayed using Right Mouse Options that provide some very key information pertaining to the orders such as Suggested Due Date, Suggested Dock Date,

Suggested Start Date, and Suggested Order Date. The calculations for these key terms are as follows:

- Suggested Due Date = Date Material Is Required
- Suggested Dock Date = Due date – Post-processing Lead-Time
- Suggested Start date = Dock date – Processing Lead-Time
- Suggested Order date = Start date – Pre-processing Lead-Time

The earliest Suggested Order Date allowed is today and no compression days are allowed.

### **Accessing and Executing Planned Orders Directly**

You can access a subset of planned orders for a specified time period or other user defined sort criteria using the Supply/Demand window.

You can also firm all planned orders or a specified subset of planned orders using a Firm All feature.

You can release all planned orders using a Release All feature or you can individually select planned orders for release.

## Summary

### Summary

In this module, you should have learned how to:

- Describe exceptions
- Describe unconstrained exception messages
- Describe recommendations

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