

MFG/PRO® eB

Introduction to MFG/PRO eB

TRAINING GUIDE



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MFG/PRO eB
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Contents

ABOUT THIS COURSE	25
Course Description	26
Who Should Attend This Course	26
Approximate Length of Course	26
About QAD	27
Best-in-Class Manufacturing	27
Vision	27
Values	27
Value Proposition	27
General Training Facilities Information	29
What's next?	29
 CHAPTER 1 INTRODUCTION	 31
Course Overview	32
Introduction to MFG/PRO eB	32
MFG/PRO eB Navigation	32
Supply Chain Concepts	33
Implementation Functionality	33
Setup	33
Basic Processing Functions	33
Planning Systems	34
Advanced Processing Functions	34
Accounting Systems	34
Service and Support Management (optional)	34

IV MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

Major MFG/PRO eB Modules	35
Course Objectives	36
Related Courses	37
What's next?	38
 CHAPTER 2 MFG/PRO eB NAVIGATION ACTIVITIES	 39
MFG/PRO eB Navigation Activities	41
Enter and Exit a Menu Selection	42
Change Your User Profile (optional)	43
Add Yourself and a Colleague as an Employee	44
Access Help	45
Reconfigure Object Screen (optional)	46
What's next?	47
 CHAPTER 3 SUPPLY CHAIN CONCEPTS.	 49
Supply Chain Concepts	50
What is the Supply Chain?	51
Supply Chain Operations Reference (SCOR) Model	52
SCOR Process Definition	54
Supply Chain Management Continuum	55
eBusiness Supply Chain Model	56
Relationships	58
Managing Supply and Demand	60
Managing Material	62
Managing Money	64
Single-Plant Functions	66
Supply Chain Management Functions	68
Multi-site Needs	68
Standard Results and Communication	68
Distribution Requirements Planning (DRP) Intersite	69
Centralized Sales Orders	69
Centralized or Distributed Purchase Orders	69
Enterprise Material Transfer (EMT)	69
Electronic Data Interchange	69

Consolidate Results	69
Supply Chain Management Information Systems	70
Computers on Wide Area Networks (WANs)	70
Distributed Functions	71
Many Options	71
Data Model	71
Supply Chain Activities	72
What's Next?	73
CHAPTER 4 SET UP MFG/PRO eB	75
Set Up MFG/PRO eB	76
Data Model Databases	77
By Database	77
Number of Databases	80
Entities	82
Sites	83
Inventory and Planning by Site	83
Data Model	84
Entity and Site	84
Setup Activities	86
Set Up Printer	87
Enter an Entity	87
Set Up a Bank for Your Entity	87
Enter Company Financing in General Ledger	87
Checkpoint	88
Locations	89
Data Model Review	91
Database	91
Entity	92
Site	92
Location	92
Setup Activities	93
Add an Inventory Status Record	94
Set Up a Manufacturing and Distribution Site	94

VI MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

Set Up Inventory Locations at Your Sites	94
Enter Your Company Address	95
Database Entity and Site Discussion	95
System Account Control File	96
Shop Calendar	97
Security	97
Generalized Codes	98
User Interface	98
Printers and Reporting	98
Set Up	98
System Security Menu	100
Menu Access and Account Security	100
Entity Security	101
Field Security	101
Site Security	101
NetUI Security	102
Inventory Movement Code Security	102
Setup Activities	103
Set Up Field Validation Using Generalized Codes	104
Product Definition	105
Product Line Maintenance	107
Item Information	109
Item Cost Development	111
Setup Activities	113
Set Up a Product Line	114
Modify Inventory Control File	114
Define End Item and Component Items	114
Product Structures	116
Parent/Component Relationships	117
Parent in One BOM/Component in Another	117
BOM Code	117
Product Structure Maintenance	118
Effective Dates and Quantity Per	118
Backflush Operation	119
BOM Codes	119

Setup Activity	120
Define Parent/Component Relationships	120
Manufacturing Implementation	121
Work Centers/Routings	121
Product Structures and Formulas	122
Shop Calendar	122
Manufacturing Facility	123
Department for Accounting	123
Work Center for Production and for Subcontracting	124
Production Line = Work Center	124
Setup Activities	125
Add a Department Record	126
Add a Work Center Record	126
Routings/Processes	127
Routing Code	127
Setup and Run or Subcontract	127
Yield	128
Parallel Processing	128
Lead Time Calculation	129
Queue Time	129
Setup Time	129
Run Time	130
Wait Time	130
Move Time	130
Subcontract Lead Time	130
Yield %	130
Lead Time Days per Order Quantity	130
Alternate Structure Maintenance	131
Alternate Routing Maintenance	131
BOM and Routing Codes	132
Substitutes	132
Co-products	133
Setup Activities	135
Define a Routing or Process Definition	135
Cost Calculations	137

VIII MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

Sources of Cost	137
Costing Process	138
Setup Activities	139
Cost Calculation Elements	140
Calculate Amount of Labor and Burden	140
Calculate Lower-level Material, Labor, Burden, and Subcontract Cost	140
Copy the Current Cost Set to the GL Cost Set	140
Checkpoint	141
Copy the GL Cost Set from Manufacturing Site to Distribution Site	141
Cost Simulation	142
Multiple Cost Sets	142
Cost Set Type SIM	143
Development Cycle	143
Roll-Up	143
Cost Planning	144
Costed MRP	144
Costed Master Schedule	144
Hyperinflationary Economies	145
What's Next?	147
 CHAPTER 5 USING MFG/PRO eB	 149
Using MFG/PRO eB	150
Inventory Management	151
Site-location Details	153
Steps	153
Monetary Aspects	154
Inventory Status Codes	155
Inventory Status Code Maintenance	155
Generic Codes	156
Restricted Transactions	156
All Transactions Check Status	156
Update Inventory Balances	157
Receipts–Unplanned	158
Other Transactions	158

IX MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

Physical Inventory	159
Physical Inventory Process	160
Freeze and Print Tags	160
Count and Update	160
Cycle Count Process	160
Transactions Detail Inquiry	161
Transaction Number and Type	162
Lot Traceability	162
Delete/Archive	162
Purchasing	163
Supplier Schedules	163
Requisitions	164
Purchase Orders	164
Blanket Orders	164
Address List Type Maintenance	165
Supplier Maintenance	167
Address and Remit-To	167
Price Lists	168
Printed Documents	168
Unit of Measure	168
Processing Activities	169
Supplier and Customer Addresses	170
Unit of Measure Conversion	170
Supplier Items	171
Customer Items	171
Requisitions	172
Approval Codes and Levels	172
Printed Requisitions	173
Blanket Purchase Orders	174
Long-term	174
No Delivery Dates or MRP	174
Release	175
Receipts	175
Purchase Order Processing	176
Manual or Blanket Order Release	176

Ship-To Site	177
Sort by Site	177
Supplier Hold	177
Processing Activities	178
Purchasing Control File	179
Manually Enter a Requisition (optional)	179
Create a Blanket Order and Release it (optional)	179
Create Purchase Orders for Component Items	180
Create a Look-up Browse	181
Purchase Order Receipts	182
Receive All	182
Multi-entry	183
Change Status	183
Receivers	183
Processing Activities	184
Record Receipts Against a Purchase Order	184
Record a Receipt Against a Purchase Order (optional)	185
Subcontract Purchasing	186
Standard Procedures	186
PO Line Item Type S	186
Work Order ID and Operation	187
Component Usage	187
Structure Code D	187
Multi-site Purchasing	188
PO Site	188
Uses Requisitions	188
Requisition Print	189
Requisitions and MRP	189
Receipts at Remote Site	189
Accounts Payable at Purchase Order Site	189
Manufacturing Overview	190
Work Orders	190
Repetitive Schedules	191
Quality Orders	191
Work Orders	192

Standard Work Order (WO) Process	192
Sources of WOs	192
Work Order Status	193
Bills and Routings	194
Standard or Alternate	194
Explode Bill and Routing	195
Customized Bill and Routing	195
Work Order Routing Maintenance	196
Operation Scheduling	196
Updated by Shop Floor Control	197
Work Order Bill Maintenance	198
Phantoms	199
Use-up Logic	199
Floor Stock	199
Work Order Allocations	200
Allocated Status	200
General Allocations	201
Picklists	201
Critical Item	201
Processing Activities	202
Update the Work Order Control File	202
Manually Add and Release a Work Order	203
Issues and Receipts	204
Issue or Backflush	204
Shortage Report	205
Shop Floor Control	206
Operation Status	206
Labor Reporting	207
Nonproductive Time	207
Variances	208
Rate Variances	208
Usage Variances	209
Method Variance	209
Processing Activities	210
Issue Components to a Work Order	211

Report Labor to a Work Order	211
Receive and Close a Work Order	212
Sales Overview	213
High Volume	213
Low Volume/High Price	214
Configured Products	214
Sales Implementation	215
Customer Addresses	216
Sales Order Pricing	217
List Price	218
Discount %	218
Discount Amount	218
Net Price	218
Sales Order Control File	219
Using Allocations?	219
Quantity Available Calculation	220
Detail Allocations	220
Default Commission	221
Use Line Item or Order Due Date for Pricing	221
Minimum Shipment Batch Confirmations and Shipments	222
Sales Order Process	223
Document Layout	225
Header	225
Line Items	226
Trailer	226
Comments	226
Adding a Sales Order	227
Unconfirmed Orders	227
Credit Checking	228
Allocations	229
General Allocations	230
Detail Allocations	230
Automatic or Manual	230
Detail for Specific Characteristics	230
Sales Order Shipments	232

Invoice History	233
Processing Activities	234
Modify the Sales Order Control File	235
Add a Sales Order Record	235
Print a Packing List and Ship the Sales Order	235
Sales Order Invoice Management	237
Effective Date	239
Period End Shipments	240
Invoice Date	240
Central Sales	241
Sales Quotes	243
No MRP—No Due Date	243
Release	244
Release Cycle	244
Lost Sales	244
Processing Activities	245
Review Pending Invoices and Print an Invoice for the Shipment	246
Post the Invoice to Accounts Receivable	246
What's next?	247

CHAPTER 6 MFG/PRO EB PLANNING SYSTEMS 249

Planning Systems	250
Planning Overview	252
Production Planning	252
Enterprise Resource Planning (ERP)	253
Product Line Planning	253
Resource Planning	253
End-item Planning	253
Rough-cut Capacity Planning	253
Component Planning	253
Capacity Requirements Planning (CRP)	254
Operations Planning	255
Family-level Planning	255
Operations Plan	256

XIV MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

Production Demands	256
Performance	256
Product Line and Resource Planning	257
Conflicting Goals	257
Enter Each Plan	258
Balance Expectations	258
Re-evaluate	258
Key Resources	258
Product Line Planning Calculations	259
Margin, Inventory, Backlog	259
Gross Margin	260
Backlog	260
Inventory Turns	260
Production Loads Capacity	260
Resource Planning	261
Resource Capacity	261
PL Resource Bill	262
LT Offset	262
Load and Capacity	262
Planning Activities (optional)	263
Calculate Labor Hours Available Per Day	264
Calculate Labor Hours Required for \$1,000 Worth of Product	264
Calculate Production Plan Based on Labor Hours Available Per Day	265
End-Item Planning	266
Input	266
Seasonality	267
Output	267
Forecast Worksheet Maintenance	268
Forecast by Week	268
Forecast Simulation	269
Total Sales and Abnormal	269
Plan Orders and Net Forecast	269
Production Forecast	269
Forecast Consumption	270
Netting Process	270

Lumpy Demand	271
Accurate Over Longer Term	271
Backward/Forward Consumption	271
Seasonal Build	272
Fluctuating Demand	272
Demand for MRP	273
Seasonal Build	273
Master Scheduling	274
Fully Manual	274
Fully Automatic	275
Computer-assisted	275
Master Schedule Summary Inquiry	276
ATP = Real Supply Minus Real Demand	277
Planning Activities	278
Enter a Forecast for Parent Item	279
Run MRP to Calculate a Master Schedule for Parent Item	279
Multi-level Master Scheduling	280
Forecast at Higher Level	280
Planning Bills (Structure Code P)	281
Forecast Consumption	281
Configured Products	281
Component Item Planning	282
Explode Component Demand	282
Planned Orders Action Messages	283
Run Statistics	283
Item and Item-Site Planning Data	284
Item Planning Maintenance	284
Item-Site Planning Maintenance	284
Independent vs Dependent	284
Order Policies	285
Order Modifiers	285
Lead Time	285
Planning Activities	286
Order Policy and Modifier	288
MRP Options	289

Selective Materials Plan	289
Net Change Materials Plan	290
Regenerative Materials Plan	291
Planning by Site	291
Planning Horizon	293
Plan Cum LT	293
Critical Path	294
Future Visibility	294
Planned Orders	295
Status: Firm Planned	295
Purchase Orders	296
Work Orders	296
Building Purchased Items	296
Repetitive Schedules	296
Action Message Review Update	297
MRP Changes Planned Orders	297
Action Messages for Other Changes	298
Print by Action Code	298
Planning Activities	300
Review Planning Data and Run Net Change MRP	301
Run a Report	301
Review Action Messages and Approve Planned Orders	301
Capacity Requirements Planning (CRP)	303
Shop Floor Control Functions	303
Backward Schedules	304
Work Center Load Summary Inquiry	305
Projected Load	305
Capacity	306
Infinite Capacity	306
Planning Activities	307
Calculate CRP and View the Load Summary and Detail	307
Balance the Plan	308
Add and Receive Purchase Orders Using Requisitions	309
Issue Components, Report labor, Receive and Close	309
Add, Ship, and Invoice a Sales Order	310

Distribution Requirements Planning (DRP)	311
Site A Supplies Site B	311
Supplying/receiving Sites	312
Source Network	312
Planning Sequence	312
DRP at the Receiving Site	313
Plan by Site	314
Inter-site Requests	314
Auto or Batch Transfer	314
DRP at the Supplying Site	315
Inter-site Demands to MRP	315
Combine on Distribution Order	316
Picklist and Ship Distribution Order	316
DRP Life Cycle	317
Transportation Management	319
Transport ID	319
Project Transport Load	320
In-Transit Inventory	320
Planning Activities	321
Set Up Prior to Running DRP	321
Run DRP and Review the Output	322
What's next?	324
 CHAPTER 7 MFG/PRO EB ADVANCED PROCESSING.	 325
Advanced Processing	326
Repetitive	327
Scheduled Production	328
Completions per Day	328
Repetitive Picklist Cycle	329
Modify Backflush	329
Repetitive Picklist Transfer	330
Location Code = Work Center	330
Repetitive-Line Sequencing	331
Finite Forward Load	331

Line Schedule Workbench	332
Update Repetitive Schedule	332
Repetitive Reporting	333
Backflush Transaction	333
Work in Process (WIP) Status Inquiry	334
Cumulative Orders	334
Advanced Processing Activities	335
Setup for Repetitive Implementation	336
Add and Explode a Repetitive Schedule	336
Create Repetitive Picklist/Transfer Material to Work Center Location	337
Report Labor Usage, Material Consumption, and Completions	337
Distribution Order Shipments and Receipts (optional)	339
Set Up and Ship a Distribution Order at Manufacturing (Supply) Site	339
Check Inventory in Transit and Receive the Distribution Order	340
Supplier Schedules	341
Generate from MRP	341
Authorizations	342
Receiving	342
Planning Horizons	343
Receipt Schedule Not Seen by Supplier	343
Schedule	344
Multiple Releases	344
Customer Schedules	345
Planning Schedules	345
Shipping Schedules	346
Ship/delivery and Authorizations	346
Shipping	346
Auto-invoicing	346
Customer Schedule Calculation	347
Calculate Due Date	347
Advanced Processing Activities (optional)	349
Set Up a Customer Schedule and Make a Shipment	350
Set Up a Supplier Schedule and Receive Materials	351
Add a Repetitive Schedule Using Line Sequence Workbench	351
Configured Structures	353

Configured–Not Stocked	353
Minimize Item Numbers	354
Feature Groups	354
Planning Order Entry	355
Forecast Percentage	355
Mandatory/Default	356
Work Order Release	356
Configuration Process	357
Processing Options: Easy Assembly–No Serial Number	357
Processing Options: Complex Assembly	358
Processing Options: Serial Number Control	358
Post to Installed Base	358
What's next?	359

CHAPTER 8 MFG/PRO EB ACCOUNTING SYSTEMS..... 361

Accounting Systems	362
Accounting Overview	364
Balance Sheet and Income Statement	364
Sales and Accounts Receivable (AR) Effects	365
Purchase Orders and Accounts Payable (AP) Effects	365
Inventory Control (perpetual vs periodic)	365
General Ledger (GL) Account Flow	366
Account Defaults	366
Multiple Currency	368
Non-base Amounts	368
Addresses and Orders	369
Banks and GL Accounts	369
Exchange Rate Maintenance	370
Effective Rate	370
Enter Spot (Optionally Fixed)	371
Report Base or Transaction Currency	371
Accounts Receivable (AR)	372
Balance by Bill-To	372
Contested and Credit Comments	373

Customer Statements	373
Dun Letters and Holds	373
AR–Customer Statements	374
Statement Cycle	374
Reference Code	375
Type Code	375
Dates	375
AR–Direct Payments	376
Auto Apply	377
Apply Unapplied	377
AR–Drafts	378
Draft Approval	378
Discount and Payment	379
Factoring	379
Use Drafts to Factor	379
Accounting Systems Activities	380
Review a Customer Account and Apply a Payment	381
Process an Unapplied Payment	382
Accounts Payable (AP)	383
How Balances Change	383
Any Currency	384
Confirmed Flag	384
Voucher and Supplier Hold	384
AP–Variances	385
PO Accrual	385
Rate or Usage Variance	386
Prepays, Taxes, Rent	386
Evaluated Receipts Settlement (ERS)	386
AP–Payments	387
Manual Payments	387
Automatic Payments	388
AP–Payment Selection	389
Unlimited Funds	389
Shortage of Funds	390
Manual Override	390

AP–Check Reconciliation	391
Cannot Delete/Archive Until Closed	391
Optional Payment in Process	392
Accounting Systems Activity	393
Add a Voucher for an Invoice Received from a Supplier	393
Process a Payment to the Supplier	394
General Ledger (GL)	395
Sources of Transactions	395
Summary and Detail	396
Unposted	396
GL Transaction Delete	396
General Ledger Setup	397
One Database–One Currency	399
Profit/Loss and Retained Earnings	399
Use Sub-account and Cost Center	400
Allow Modification	400
Balanced Entities	400
General Ledger Transactions	401
Control Total	401
Memo and Statistical	402
All Unposted	402
GL–Unposted Transactions	403
Transaction Type	403
General Ledger–Budgets	405
Multiple Budgets	405
By Account or Format	405
Percent of Actual	406
Budget Calculate	406
Comparative Reports	406
General Ledger–Reports	407
Report Options	407
Effective Dates	408
Entity Range	408
Custom or Results	408
GL Report Writer	408

Accounting Systems Activities	409
Review GL Setup and Review How to Structure Financial Statements	410
Process GL Transactions	410
Print Company Financial Statements	411
GL–Period End	412
Module and GL Closed	412
Reopen Period	413
GL–Year End	413
Year-End Close	413
Transaction Detail Retained	413
Consolidation	413
GL–Corporate Consolidation	414
Multi-entity Consolidation	414
Export/Import Process	415
Realized Gain/Loss	416
Unrealized vs Realized	416
Sales Orders/Accounts Receivable	417
Purchasing/Accounts Payable	418
Rate Stored on Receiver	418
Purchase Cost Variance	419
Calculation of Unrealized Gain/Loss	420
Historical Rates in GL	420
Revalue GL	421
GL–Revaluation	422
Revalue Before Export	422
Translation Process	423
Current Rate Accounts	423
Cash Management	424
Balance to Statement	425
Cash Flow Projections	426
Cash Flow from Operations	426
Expected Pay Date	427
Short- vs Long-Term Projections	427
Course Overview	428

APPENDIX A INTRODUCTION TO MFG/PRO EB FINAL ACTIVITY 429

Set Up an Entity Code	431
System Account Control File Set Up	431
General Ledger	432
Sales Order Control File Set Up	432
Set Up a Unique Entity and Site Code	432
Widget Making	433
Item Planning Data	435
Set up Supplier Address Records	436
Cost Roll Up	436
Print Cost Report	437
Planning	437
Enter Your First Sales Orders	438
Run MRP	438
Capacity Planning	439
Extra Credit	440
Sales Analysis	441
Self-Evaluation	441

APPENDIX B Yo Yo Co. 443

Sample Company	444

APPENDIX C MFG/PRO EB SERVICE/SUPPORT MANAGEMENT 451

Service and Support Management (optional)	452
Installed Base	453
Installed Base from Sales	454
Install Call	455
Warranty Registration	455
Service Items Only	455
Field Notifications	455
Warranties	456
End User Types	457
Ship Before Receive	457
Service Contract Type	458

Creating Contracts	458
Quote-contract Process	459
Billing Cycles	459
Preventive Maintenance	459
Contract Renewal	459
Call Tracking	460
Call Queue	461
Engineer Scheduling	461
Call Escalation	461
Service Requests	461
Call Activity Recording and Invoicing	461
Return Material Authorization (RMA) and Return to Supplier (RTS)	462
Service Inventory	464
MO Life Cycle	465

About This Course



Course Description

QAD designed this course to introduce you to MFG/PRO eB.

MFG/PRO eB supports the QAD vision of being a supplier of industry specific e-business solutions. Along with a broad range of functional enhancements, MFG/PRO eB introduces a new architecture that opens up its business functions to easily integrate with other e-business applications. *Introduction to MFG/PRO eB* serves as the foundation for all other QAD classes.

This course covers:

- MFG/PRO eB navigation
- Terminology
- MFG/PRO eB and supply chain management
- Key concepts and MFG/PRO eB system philosophy
- Basic MFG/PRO eB implementation decisions
- Primary components and operational flow of MFG/PRO eB modules
- Interrelationships of MFG/PRO eB functions and modules
- MFG/PRO eB setup, processing, advanced processing, and planning and accounting systems

This course is high-level, accelerated, and conceptual. It will provide you with a basic understanding of MFG/PRO eB functions upon which you can build.

The class format is a combination of lecture and hands-on activities, simulating what you need to do to run a business using MFG/PRO eB.

Activities are divided into required and optional tasks.

- Required tasks give you a hands-on opportunity to try MFG/PRO eB
 - Activities are cumulative
 - Complete the tasks in one activity before you continue with the next lesson
- Optional tasks allow you to be more creative and to explore MFG/PRO eB with less direction

Who Should Attend This Course

- Implementation consultants, implementation teams, and MFG/PRO eB key users

Approximate Length of Course

- This course is designed to be taught in ten days

About QAD

Best-in-Class Manufacturing

QAD's global manufacturing expertise delivers value through collaborative commerce applications that empower enterprises to integrate diverse business processes and increase market share.

Manufacturers of automotive, consumer, electronics, food and beverage, industrial, and medical products use QAD software at more than 5,100 licensed sites in more than 80 countries and in as many as 26 languages.

QAD has a proven track record of more than 20 years of leadership in collaborative commerce applications.

- Leading innovator in collaborative commerce solutions for the manufacturing marketplace
- Global technical, implementation, learning, and support services
- ISO 9002 certified in 1995
- Public company (Nasdaq: QADI)

Vision

QAD products help to create a competitive advantage in the marketplace for our customers.

Values

- Customer-oriented
- Integrity
- Teamwork
- Innovation
- Speed
- Diversity

Value Proposition

The global manufacturing expertise of QAD delivers value through collaborative commerce applications that empower enterprises to integrate diverse business processes and increase market share.

Enterprise

- Manufacturing, Distribution, Financials, Service, Business Intelligence, Demand Management, Supply Chain Optimization, Interoperability, EDI ECommerce

Enterprise Exchanges

- Commerce Relationship Management, QAD eQ Sell-side, QAD eQ Buy-side, QAD eQ Replenishment, QAD Supply Visualization

Marketplace Exchanges

- Solutions for trading exchanges and e-markets



General Training Facilities Information

- Telephone, fax, email
- Messages
- Restrooms
- Class hours
- Breaks: frequency, approximate times
- Parking
- Emergency procedures: location of first aid, contact person for assistance
- Exit locations and building hours
- Smoking areas

What's next?

The next section, the Introduction, gives you a high-level overview of what we will cover in this course.

CHAPTER 1

Introduction





Course Overview

- ♦ Introduction
- ♦ MFG/PRO eB Navigation
- ♦ Supply Chain Concepts
- ♦ Set Up MFG/PRO eB
- ♦ Use MFG/PRO eB
- ♦ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-IN-040

Course Overview

Introduction to MFG/PRO eB

This course introduces you to MFG/PRO eB. MFG/PRO eB supports the QAD vision of being a supplier of industry-specific e-business solutions. Along with a broad range of functional enhancements, MFG/PRO eB introduces a new architecture that opens up its business functions to easily integrate with other e-business applications.

MFG/PRO eB Navigation

You will first learn how to navigate in MFG/PRO eB which is available in several interfaces:

- Windows
- Character
- NetUI
- Object-oriented Programs Interface

For purposes of this training, we will use the Windows interface and keyboard commands.

Supply Chain Concepts

To understand MFG/PRO eB, you need to understand the supply chain that connects plants, customers, and suppliers. This course describes the supply chain and its functions, then maps those functions to the MFG/PRO eB modules that support them.

Implementation Functionality

This course does not cover the project plan part of an implementation, but it does examine the MFG/PRO eB concepts to be understood prior to implementation.

Setup

In this course, you will learn how to set up a System/Account Control File, enter an entity, set up a bank, enter the company financing in the General Ledger (GL), print a beginning balance sheet, add an inventory status record, set up a manufacturing and distribution site, set up inventory locations, enter your company address, set up generalized codes, set up a product line, and modify the Inventory Control File.

You will also define end items and component items, define parent/component relationships, add department and work center records, define a routing or process, roll up routings to calculate amount of labor and burden for manufactured items, roll up product structure to calculate amount of lower-level material, labor, burden, subcontract cost, and copy the current cost set to GL cost set.

Basic Processing Functions

After you have set up the basic infrastructure and product definitions, you can implement other modules in any order that works for your company.

Each of the MFG/PRO eB modules—Sales Orders, Purchasing, Manufacturing, and Customer Services—affect inventory.

In this course, we discuss inventory and the location or account common to all materials that are bought, manufactured, and sold. This is followed by a discussion of purchasing and the process for receiving materials. Purchasing is the primary means for receiving material into inventory.

Then we will look at work orders, where component inventory is used to manufacture an end item. We will also examine how end items are returned to inventory to be sold and shipped out of Sales Orders.

Planning Systems

At the core of MFG/PRO eB are the planning systems that provide both high-level and detailed operation-level plans. In this course, we will look at how purchasing, work orders, and sales orders fit into the planning process.

Advanced Processing Functions

This course covers some of the processing options and functions available in addition to the basic functionality in MFG/PRO eB. It describes how MFG/PRO eB accommodates manufacturing and distribution environments and provides flexibility.

Accounting Systems

In the Accounting Systems chapter, we discuss the accounting modules of MFG/PRO eB—how they are integrated with each other and how they are affected by activities throughout the system.

This chapter is designed to give you a well-rounded understanding of MFG/PRO eB from a planning, operational, and financial point of view.

Service and Support Management (optional)

The customer relationship often does not end when the product is sold. Products must be repaired and serviced, and questions answered. This is where Service and Support Management (SSM) comes in. This chapter covers a high-level overview of SSM. It is optional.

Major MFG/PRO eB Modules



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Major MFG/PRO eB Modules

- Distribution
- Master Files
- Manufacturing
- Custom
- Financial Management
- Supply Chain Management
- Customer Services



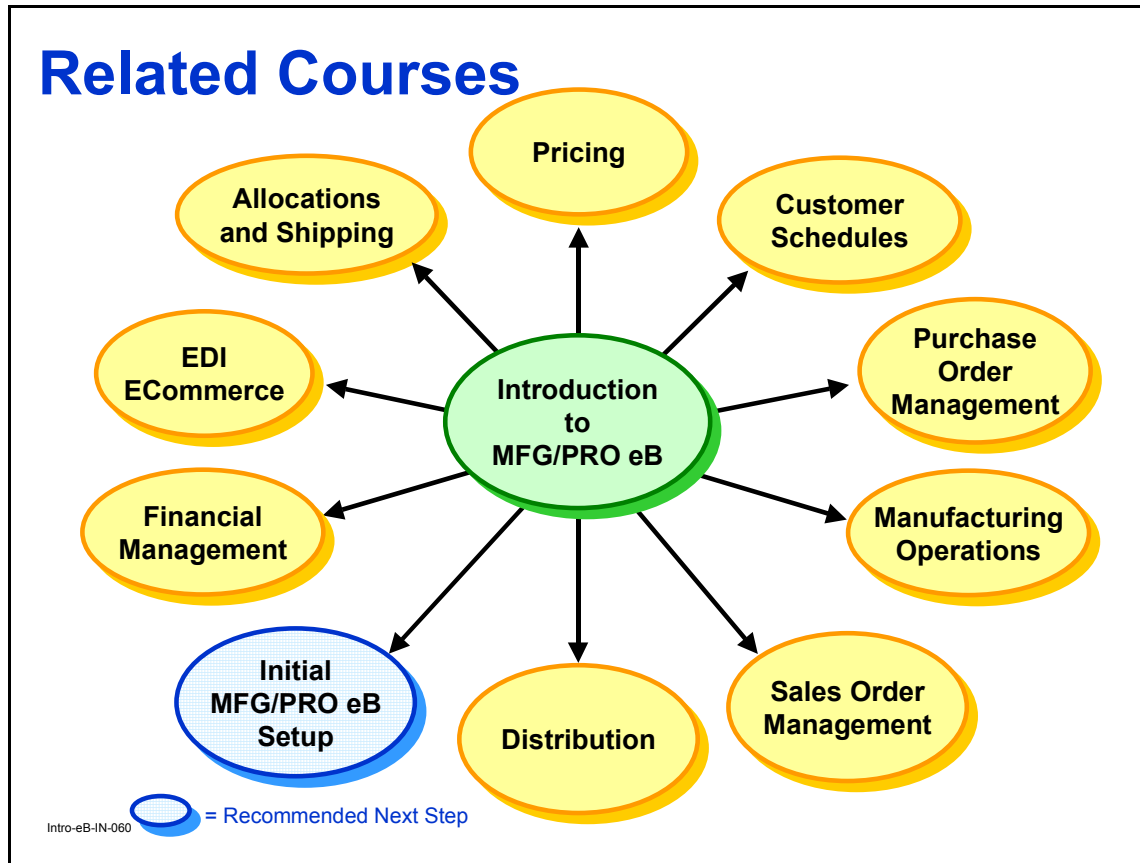
Course Objectives

In this class you learn how to:

- ◆ Identify some key business considerations before setting up MFG/PRO eB
- ◆ Navigate in MFG/PRO eB
- ◆ Consider Supply Chain Concepts
- ◆ Set Up and Use MFG/PRO eB
- ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-IN-050

Course Objectives



Related Courses



Course Overview

- ✓ Introduction
 - ♦ MFG/PRO eB Navigation
 - ♦ Supply Chain Concepts
 - ♦ Set Up MFG/PRO eB
 - ♦ Use MFG/PRO eB
 - ♦ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-IN-070

What's next?

Next, we will acquire more detailed information about how MFG/PRO eB modules are organized and about how to use MFG/PRO eB user interfaces.

CHAPTER 2

MFG/PRO eB Navigation Activities





MFG/PRO eB Navigation Activities

In this section you learn how to:

✓ Introduction

✓ Navigate in MFG/PRO eB

- ♦ Supply Chain Concepts
- ♦ Set Up MFG/PRO eB
- ♦ Use MFG/PRO eB
- ♦ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-Nav-010

Included as part of your *Introduction to MFG/PRO eB* training materials, you will find a copy of the *MFG/PRO eB User Guide Volume 1: Introduction*. We will use this user documentation in this class to learn more about MFG/PRO eB organization and navigation.

Please refer to that document now.

MFG/PRO eB Navigation Activities



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MFG/PRO eB Navigation Activities

In the following activity you:

- Learn how to enter and exit a menu selection
- Change your user profile and review each of the different menu styles
- Add yourself and a colleague as an employee

Enter and Exit a Menu Selection

In this activity, you practice maneuvering around in MFG/PRO eB.

- 1** Log in to MFG/PRO eB.
- 2** Use your initials as your user ID. No password is required.
- 3** Assuming you are in the Windows version of MFG/PRO eB, the default menu style for your database should be Icon. There are seven icons:
 - Distribution
 - Master Files
 - Manufacturing
 - Custom
 - Financials
 - Supply Chain Management
 - Customer Services

With your mouse, practice clicking on each of the icons and notice how the menu selections change in the window.

- 4** Click on the Master Files icon.
- 5** Select Addresses/Taxes, menu number 2.
- 6** From the window, select submenu 7, Employees Menu.
Notice that the menu path you have followed displays on the left-hand side of the screen.
- 7** Now select Employee Maintenance, menu option 1.
This will take you into the Employee Maintenance program.
- 8** Exit the Employee Maintenance program by pressing the Escape key. Continue to press the Escape key until you are back at the Main Menu.
- 9** From the main menu, select the Employee Maintenance program by typing 2.7.1.
- 10** Exit by pressing the Escape key.
This time you are back at the Main Menu.
- 11** Go to the Item Data Menu by typing 1.4.

This is an example of a submenu. If you are in a submenu, you must use a period in front of the menu string to get a program not on the submenu. For example, type .2.7.1 from the Item Data Submenu, 1.4, to get to the Employee Maintenance program.

Change Your User Profile (optional)

- 1** From the Main Menu, click on the Master Files icon.

- a** Select Master Files 36
- b** Select UI: Manager Functions 20
- c** Select User Interface Profile 4

You have now reached 36.20.4. This is an example of an object program.

- 2** At the user ID field, use the same ID you used to log in to MFG/PRO eB. Use the Go key to continue to the next frame.

You are now shown a series of button boxes to modify.

- a** Go to the button box titled Menu Style and select Tear-off.
- b** Be sure that the WinHelp? box is not checked.
- c** Use the Go key to save the record.
- d** Exit the program and return to the MFG/PRO eB sign-on screen.
- e** At the MFG/PRO eB sign-on screen, click on the OK button.

- 3** Reenter MFG/PRO eB. The menus should have changed to the Tear-off style.

- a** Practice clicking on the menu bars.
- b** Return to the Main Menu.
- c** Go to Employee Maintenance 2.7.1.
- d** Exit Employee Maintenance.
- e** Press Escape to exit the program.

- 4** At the MFG/PRO sign-on screen, click on the OK button.

- a** Reenter User Interface Profile 36.20.4.
- b** Change the menu style to Character.

44 MFG/PRO TRAINING GUIDE — INTRODUCTION TO MFG/PRO eB

- c** Use the Go key to save the record.
 - d** Exit the program and return to the MFG/PRO eB sign-on screen.
 - e** At the MFG/PRO eB sign-on screen, click on the OK button. The menus should have changed to the Character style.)
 - f** Practice clicking on the menu selections.
 - g** Return to the Main Menu.
 - h** Go to Employee Maintenance 2.7.1.
 - i** Press the Escape key to exit the program.
- 5** Reenter User Interface Profile 36.20.4.
- j** Change the menu style to Icons.
 - k** Use the Go key to save the record.
 - l** Exit the program and return to the MFG/PRO eB sign-on screen.
- 6** At the MFG/PRO eB sign-on screen, click on the OK button. The menus should have changed to the Icon style.
- a** Practice clicking with your mouse and using the menu numbers to get to Employee Maintenance 2.7.1.

Add Yourself and a Colleague as an Employee

- 1** Choose Employee Maintenance add yourself as an employee in the database.
- a** You can use your initials as the employee code.
 - b** Press the Go key to move to the next frame.
 - c** Enter appropriate field values.
The Enter key moves your cursor to the next field.
 - d** When you are at the final field in the frame, use the Enter key to move to the next frame (folder). Or you can press the Go key or click on the folder tab with your mouse to get to the next frame you want to update.
 - e** From the final frame, press the Go key to save the record.

- 2** Create a new record for a colleague.
 - a** Instead of using his initials for the employee code, leave the field blank.
 - b** Press Go to add the new record.
What employee code was used?
 - c** Complete the record and exit to the Main Menu.

Access Help

In this activity you will access the different types of help in MFG/PRO eB.

- 1** Go to Salesperson Maintenance 2.5.1.
 - a** Leave the Salesperson field blank.
 - b** Click on the look-up browse icon directly right of the field. A pop-up browse window appears.
 - c** From this list, select a salesperson code by double-clicking on the salesperson record.
 - d** While still on the Salesperson field, press Help (F1). A window with field help will appear.
 - e** Read the field help about the salesperson field.
 - f** Exit by closing the window.
- 2** Look on the tool bar and find the icon for field help. (When your cursor points to the field help button, you will see the “Field Help” label below the button.)
 - a** Click on the icon. The fields on the screen are now highlighted.
 - b** Drag the cursor to any field and click on the field. Field help will appear for the field.
 - c** Close the field help window.
- 3** Look on the tool bar and find the icon for procedure help. (When your cursor points to the procedure help button, you will see the “Help” label below the button.)

- 4** Access procedure help and find out how to use the Salesperson Maintenance program.
 - a** Enter your initials as the salesperson code and add yourself as a salesperson.
 - b** While you are on the commission field, from the menu bar, select Field Help and read about how the commission field is used.
 - c** Practice selecting the other types of help from the menu bar.
 - d** Complete adding your salesperson record and exit.

Reconfigure Object Screen (optional)

In this activity you configure an object program screen so you can cycle through the folders in the order you choose.

- 1** Go to Salesperson Maintenance 2.5.1.
 - a** From the menu bar, select Config.
 - b** Select the Reconfig option on the menu.
 - c** In the Resequencing Configurable Frames window, highlight the User Fields frame.
 - d** Change the order that you cycle through the folders by clicking on the move down button.
 - e** Move the User Field frame below the Browse frame.
 - f** Click on the Save Configuration box to save your configuration.
 - g** Save the configuration by clicking on the Save check mark.
 - h** Exit.
 - i** You will be asked again to save the configuration. Answer Yes. (Notice now that the order of the folders has changed.)
- 2** If you do not want to cycle through the folders automatically, change the folder selection by selecting and deselecting the folder name on the Config Menu option on the menu bar.



Course Overview

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ◆ Supply Chain Concepts
- ◆ Set up MFG/PRO eB
- ◆ Use MFG/PRO eB
- ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - MFG/PRO eB Advanced Processing
 - MFG/PRO eB Financial Systems

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What's next?

Now that you know how to navigate around in MFG/PRO eB and have a basic understanding of how MFG/PRO eB is organized, the next step is to gain a high-level understanding of supply chain management.

The next chapter gives an overview of supply chain concepts so that you can use it as a frame of reference as you begin to learn more about how MFG/PRO eB can help you effectively manage all of the elements in your supply chain:

- Material, information, financials
- Suppliers, manufacturers, distributors, customers

The coordination and integration of these elements across the supply chain are critical to a company's success.

Supply Chain Concepts





Supply Chain Concepts

In this section you learn:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ **Supply Chain Concepts**
 - ♦ Set Up MFG/PRO eB
 - ♦ Use MFG/PRO eB
 - ♦ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

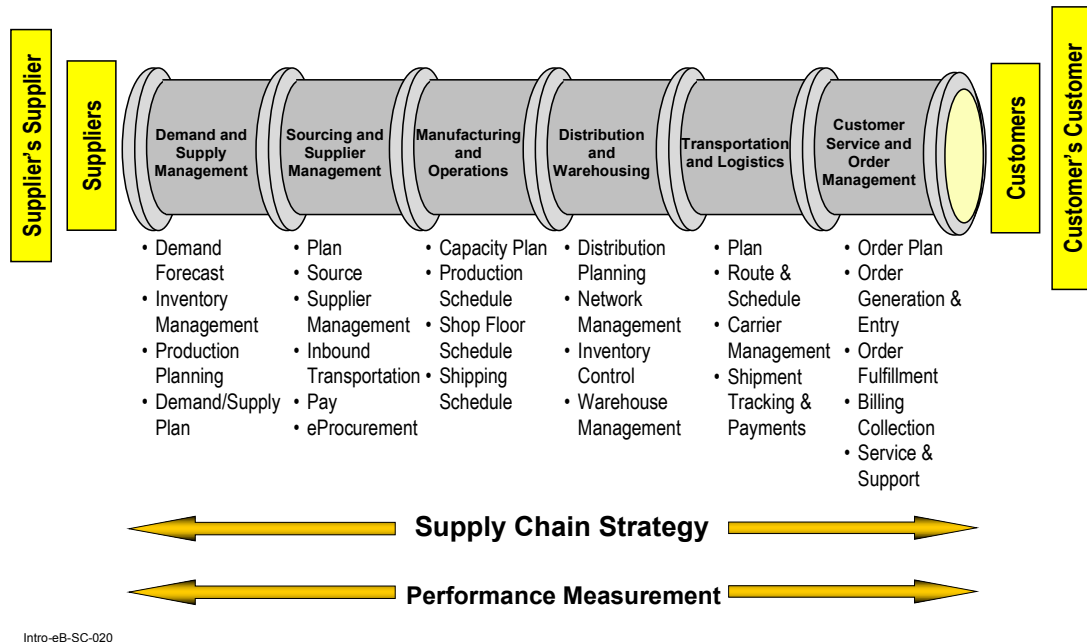
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Supply Chain Concepts

In this chapter we will describe the supply chain from its simple beginnings to today's complexity. After that, we will look at the MFG/PRO eB data model of the supply chain.

Mapping the reality of your company into this data model is an initial and crucial step in any implementation. This chapter will focus on how mapping is done.

Supply Chain Training Model



What is the Supply Chain?

The supply chain is made up of strategies, policies, and processes that enable raw materials to be converted into products for customers delivered where and when customers want them.

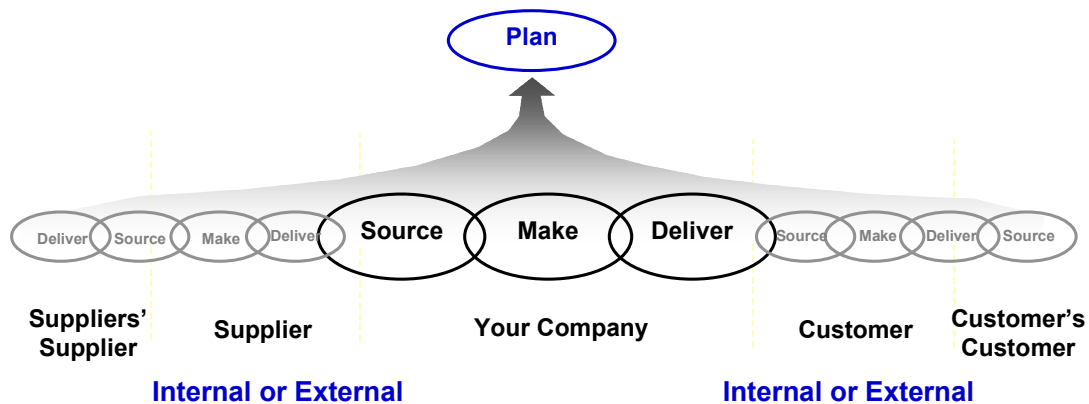
The supply chain is the path of goods and information from your suppliers all the way to your end customers. MFG/PRO eB provides a way to manage the global supply chain.

Before you can understand the functions of MFG/PRO eB, you need to understand two things:

- 1 The supply chain
- 2 How to manage the supply chain

Although this sounds simple, it can be quite complex, requiring the management of functions that are spread out geographically.

Supply Chain Operations Reference (SCOR) Model



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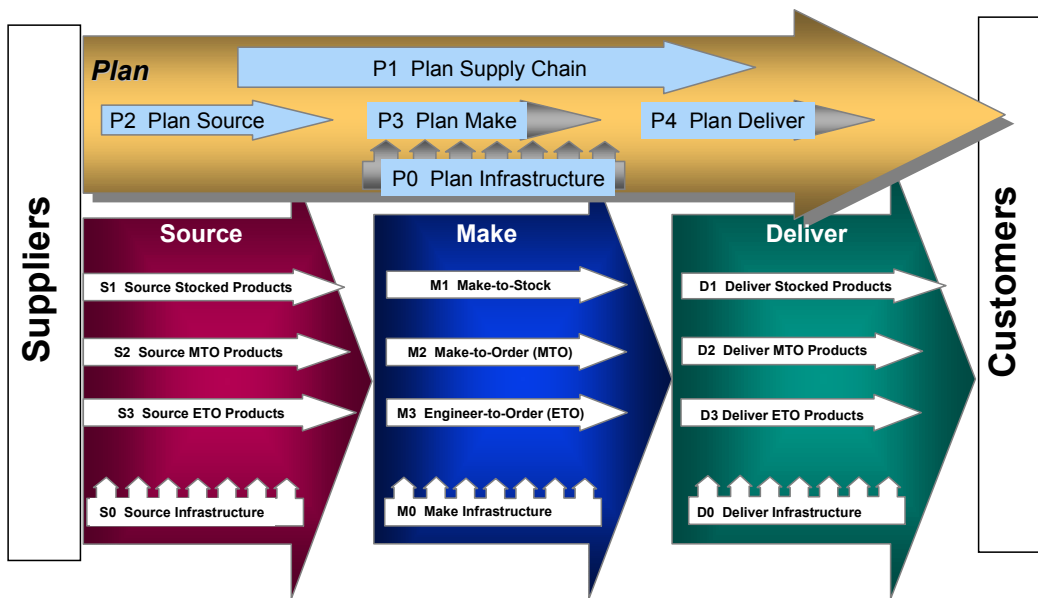
Supply Chain Operations Reference (SCOR) Model

There are a variety of models that are used to represent the supply chain. The SCOR model is one. This model is founded on four distinct management processes:

- Plan
 - Demand and supply planning
- Source
 - Sourcing and material acquisition
 - Managing sourcing infrastructure
- Make
 - Production execution

- Managing make infrastructure
- Deliver
 - Order management
 - Warehouse management
 - Transportation and installation management
 - Managing delivery infrastructure

SCOR – Process Definition

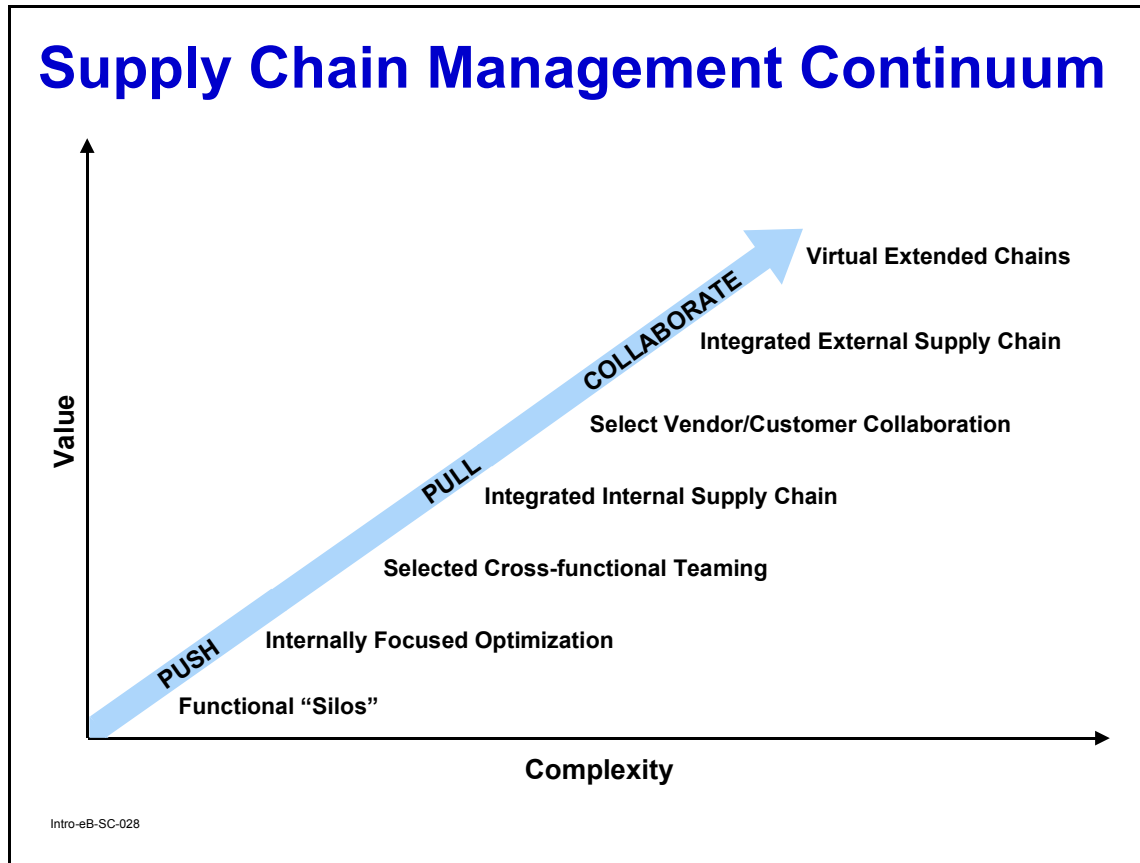


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SCOR Process Definition

The SCOR methodology can be applied in four steps:

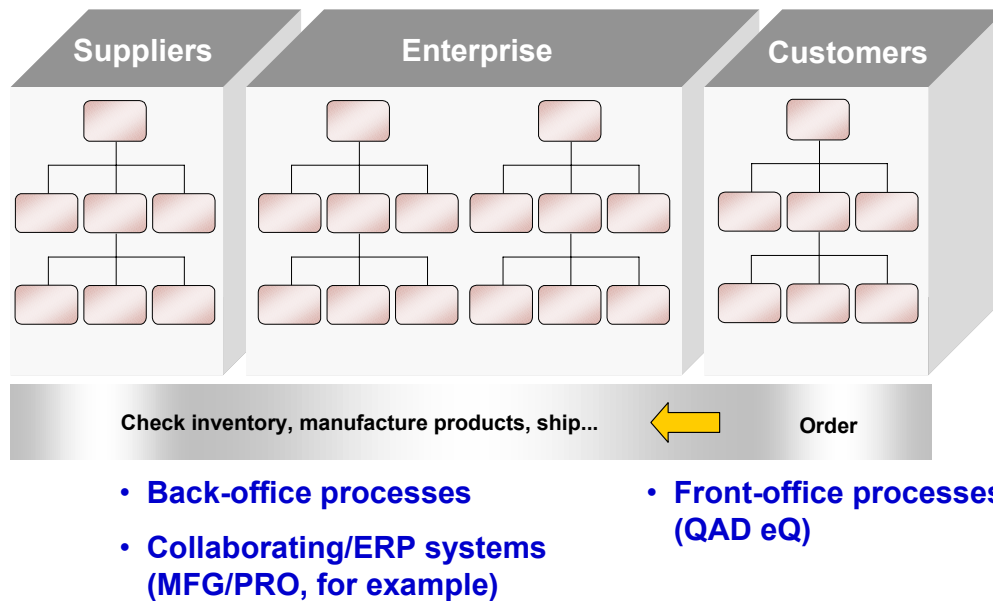
- 1 Analyze the basis of competition
- 2 Configure the supply chain
- 3 Align performance levels, practices, and systems
- 4 Implement supply chain processes and systems



Supply Chain Management Continuum

As supply chains become more intelligent, companies move up the supply chain management continuum. The further companies move up the continuum, the more complex supply chains become and there is more collaboration between suppliers and customers.

eBusiness Supply Chain Model



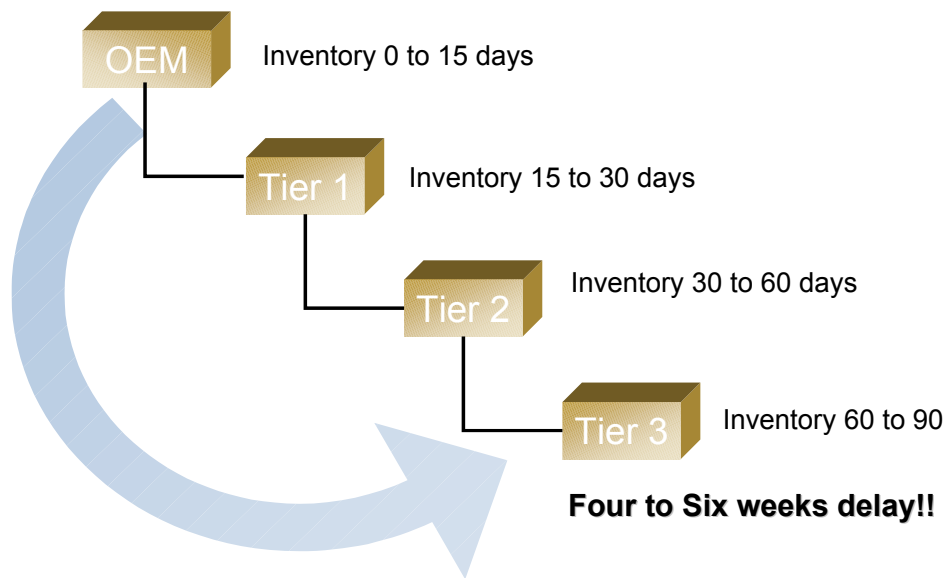
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eBusiness Supply Chain Model

We define eBusiness as business conducted using electronic media, such as the Internet, other computer networks, wireless transmissions, and so forth.

The eBusiness Supply Chain Model shown above illustrates how eBusiness uses electronic technology and a single interface to control all the information related to a company's business, including customers, manufacturing processes, and suppliers.

Supply Chain Cost and Delays

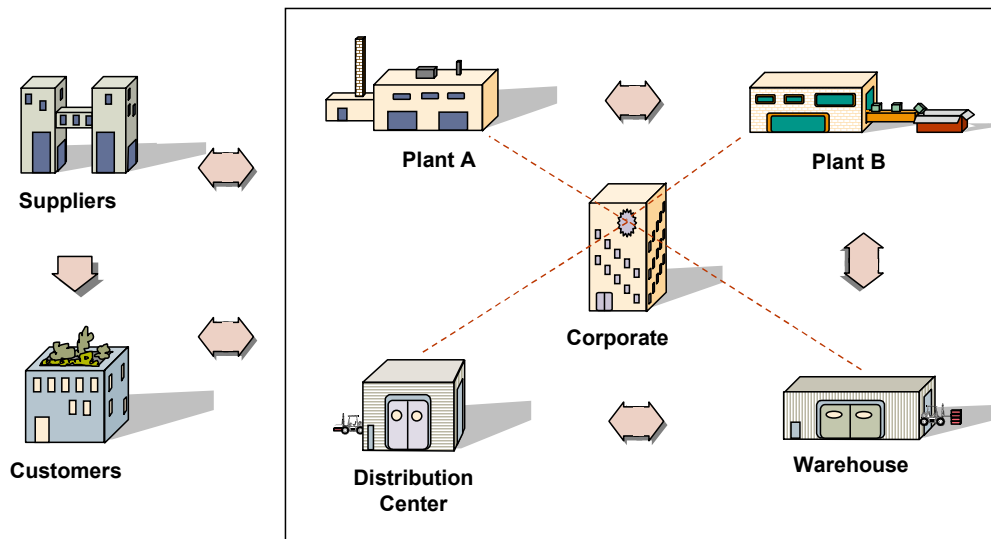


Even small companies find themselves manufacturing in or distributing from several locations in order to lower costs.

Eliminating unstable operations between trading partners will:

- Maximize your supply chain
- Improve customer service
- Enhance quality
- Reduce lead time
- Improve flexibility

Supply Chain Relationships



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Relationships

Movements through the supply chain involve multiple parties:

- One or more levels of customers, each potentially having different:
 - Ship-to, bill-to, and sold-to parties
 - Requirements
- One or more sales agents or representatives who:
 - Interface with customers
 - Determine product availability and shipping location
- One or more levels of local or regional:
 - Distribution centers

- Warehouses
- One or more plants supplying finished or semifinished products
- Suppliers with different product and pricing options

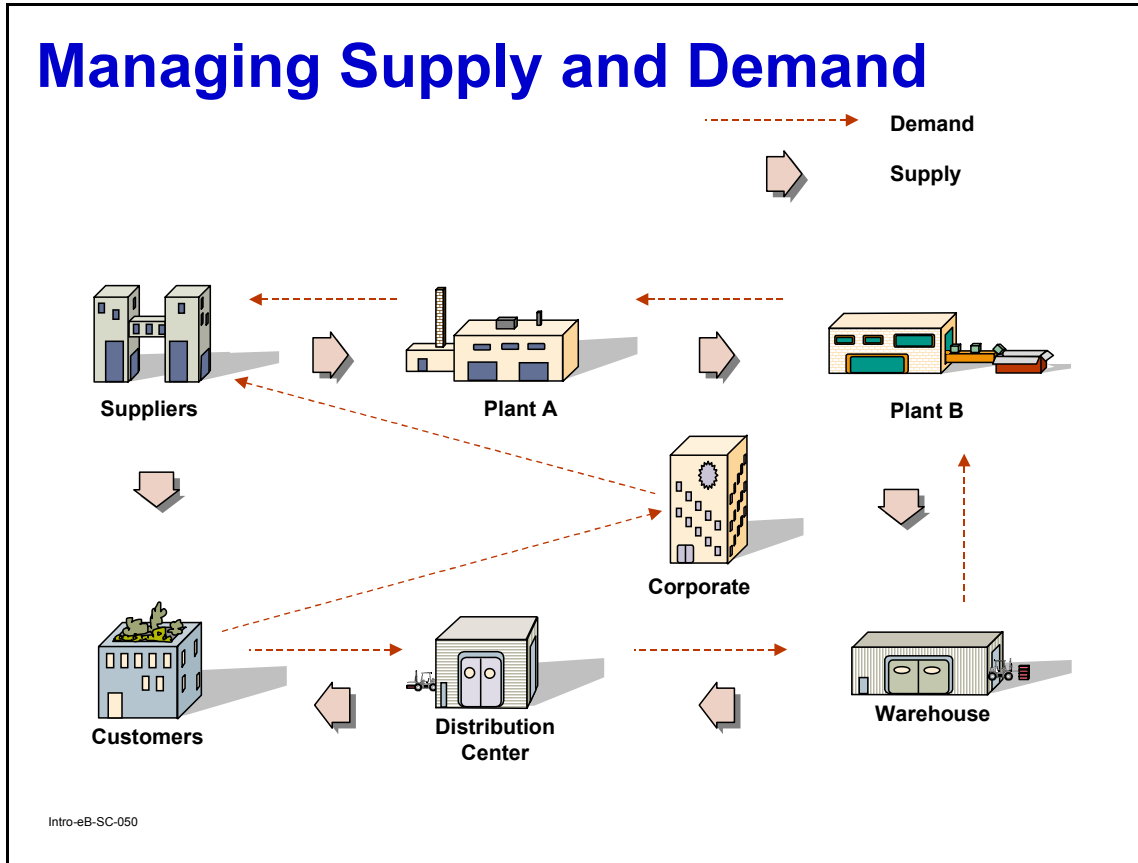
Coordination

This complexity requires the coordination of:

- Production
- Transportation
- Capacity
- Supply
- Operations planning
- Budgeting

In addition, performance reporting must be coordinated over multiple facilities, possibly in multiple countries, while maintaining high service levels.

- Managing the global supply chain breaks down into managing three main categories of tasks:
 - Supply and demand
 - Material
 - Money



Managing Supply and Demand

Managing supply and demand requires managing information and schedules from your customer and to your suppliers (internal and external). Several MFG/PRO eB modules facilitate this.

Sales Orders and Schedules

In MFG/PRO eB, the Sales Quotes, Sales Orders/Invoices, and Service and Support Management functions manage customer information and schedules. These record and manage customer requirements. Forecasting predicts customer demand. This information feeds into the planning system.

Purchase Orders and Schedules

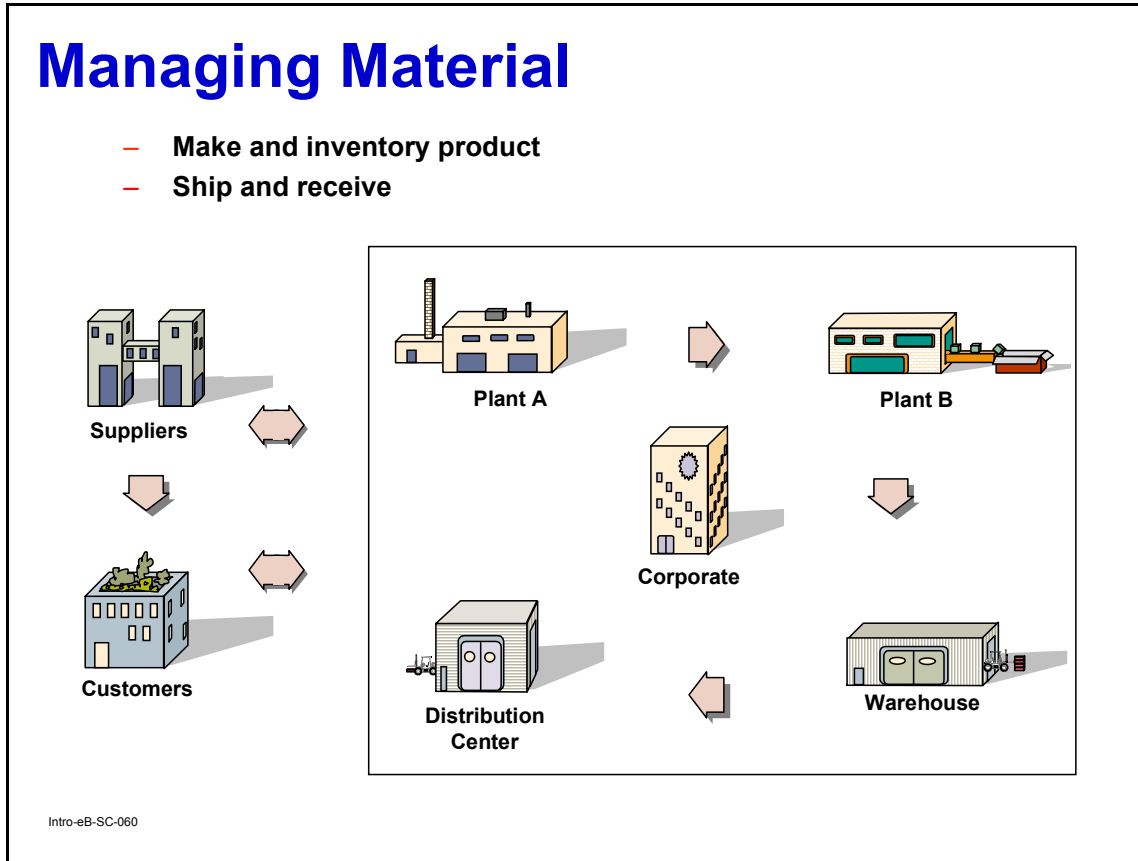
- Supplier communications are processed in Purchasing.
- Requisitions are generated for purchasing to fulfill, and purchase orders are generated
- Infrequent purchases of commonly used materials can be managed using blanket orders
- Supplier schedules manage frequent purchases

The planning system, Material Requirements Planning (MRP), projects requirements to help you calculate orders and schedules.

Intersite (Distribution Requirements Planning)

Distribution Requirements Planning (DRP) manages intersite communication of supply and demand information. This effectively integrates the planning systems of multiple sites in your organization.

It is important to recognize that in MFG/PRO eB, supply and demand information can be collected at the individual site level, or managed in aggregate at the corporate level through the distributed sales and purchasing functionality.



Managing Material

Plan and Execute

Managing material is the second important category of global supply chain management tasks. Once you have information about supply and demand, you use it to plan for the materials you need and to execute the plan.

Local Inventory and Product Definition

In MFG/PRO eB, this is normally done at the plant level. Each plant manages its own inventory and its own manufacturing operations. To do this, the plant needs to maintain a list of its products and how they are produced. Each manufactured item has one or more product structures (or

formulas) and one or more routings (or processes). The inventory control and physical inventory functions maintain and monitor on-hand balances.

Manufacturing Control

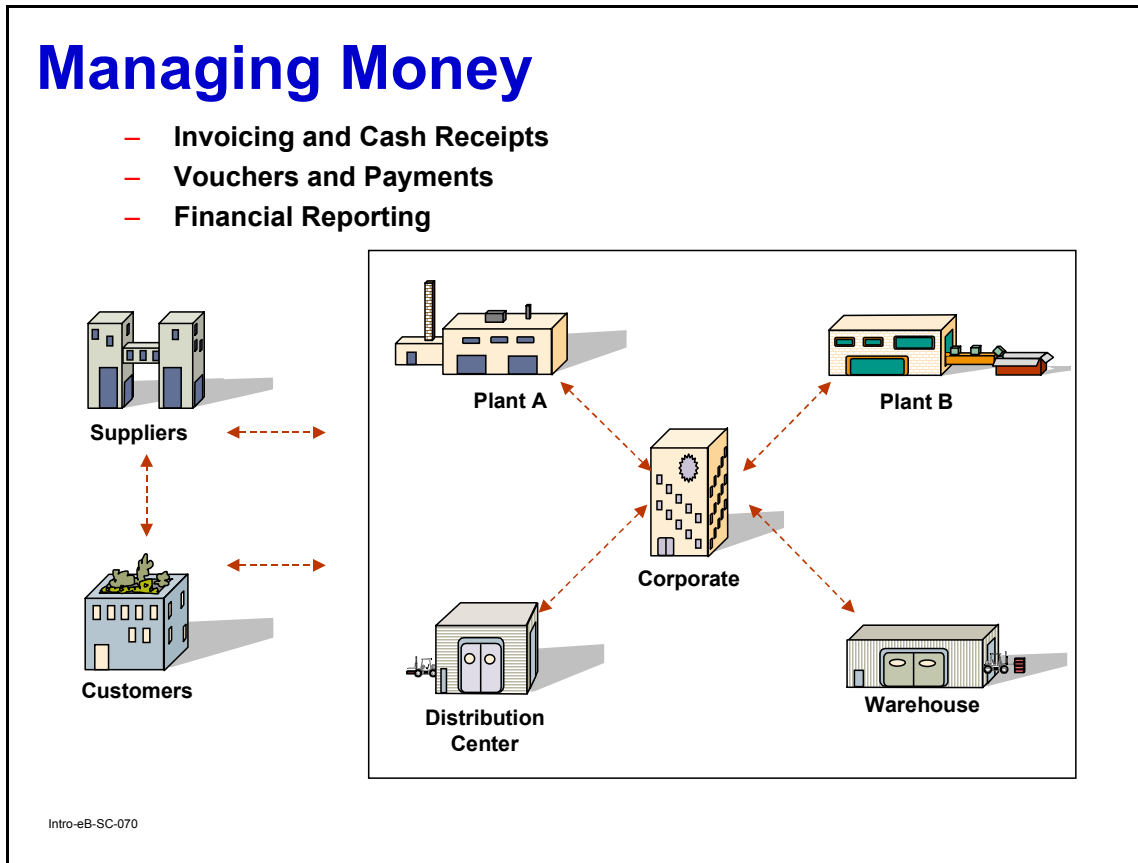
The manufacturing process itself is managed using some combination of work orders, repetitive schedules, and quality orders. Components and labor can be tracked against each type of manufacturing order, collecting costs and variances in support of performance analysis, profit planning, and control.

Local Planning

With the exception of corporate operations planning, planning is normally done locally. The business plan is translated into a production plan and shipping forecast. Both are verified against resource availability, then used to develop a master schedule. This determines exact production quantities and due dates, and generates detailed material and capacity requirements.

Operations Planning

Powerful operations planning features in MFG/PRO eB enable you to consolidate and coordinate the planning for multiple manufacturing sites. The system also provides visibility of global inventory and capacity, enabling you to distribute the manufacturing load optimally to meet customer requirements.



Managing Money

Managing money is the third important category of global supply chain management tasks. These financial tasks involve managing cost and projecting and managing cash flows.

Integrated Financials

The financial modules are tightly integrated with the execution modules of MFG/PRO eB and provide complete financial information to the MFG/PRO eB user. Customer and supplier balances are maintained, and payments are monitored in your company's base currency or any other. All module activities can create general ledger (GL) transactions, including realized and unrealized gains/losses on currency. These are accumulated in the GL and compared to budget. GL transactions can also be exported for consolidation.

Short- or Long-term Projections

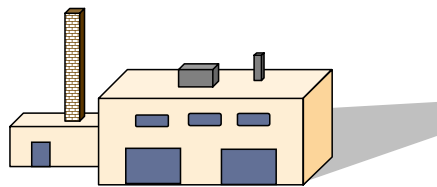
Short- or long-term cash flow projections can be generated based on sales, receivables, purchases, payables, service and support management, and miscellaneous cash sources or uses. Companies that use electronic funds transfer can manage cash activity and reconcile bank statements using a cash book approach.

Average or Standard

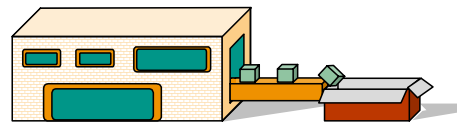
MFG/PRO eB supports both average and standard costing for GL purposes, but an unlimited number of other costs can be maintained as well. This enables you to easily simulate the effects of cost changes and develop cost plans. When using standard costs, manufacturing and purchasing variances are tracked. When using average costs, averages are updated by each receipt.

Single-Plant Functions

- Purchasing
- Sales
- Manufacturing
- Accounting



Plant A



Plant B

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Single-Plant Functions

Before we go on to the more complex issues involved in implementing a multiple-site environment, we will look at the functions involved in managing at the local level.

Each Plant

Each plant will have:

- Item information
- Product structures
- Routings
- Formulas and processes

- Inspection and quality tests
- Inventory
- Manufacturing orders
- Planning

These are all of the functions involved in making product. In MFG/PRO eB, these are defined and operated at the plant (site) level.

Normally, each plant will also be involved in buying, selling, and accounting for these products. However, in MFG/PRO eB, you can run the functions associated with these activities locally or manage them in a distributed fashion. Distributed functions include sales quotes, sales orders and invoices, and purchasing.

Supply Chain Management Functions

- **Standardized software**
- **Distribution Requirements Planning (DRP)**
- **Central sales order processing**
- **Distributed purchasing**
- **Enterprise Material Transfer (EMT)**
- **Release management (EDI)**
- **Corporate financial consolidation**

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Supply Chain Management Functions

Multi-site Needs

In a multi-site implementation, there are some additional basics that are important to consider.

Standard Results and Communication

Standardized software ensures that different facilities in the chain can communicate and that each is working from and toward the same set of numbers. Standardized results are easily summarized for financial reporting and operations planning. So software should be standard.

Distribution Requirements Planning (DRP) Intersite

DRP is needed to manage the internal flow of products. When one facility needs products from another, DRP determines the quantity required and transmits a request to the supplying facility.

Centralized Sales Orders

Use the central sales functionality when sales order processing and invoicing are centralized, but demands are communicated to remote facilities for shipment.

Centralized or Distributed Purchase Orders

Purchasing can be distributed or centralized to take advantage of closer supplier partnerships and the economies they bring by processing all purchasing activity for a given product for all facilities. All requirements are aggregated and just one purchase order is issued for the total.

Enterprise Material Transfer (EMT)

EMT is the automatic translation of sales orders or material orders into purchase orders and transmission to the appropriate supplier using electronic data interchange (EDI) or EDI ECommerce.

EMT also manages and coordinates changes so that sales order (or material order) and purchase order information are synchronized.

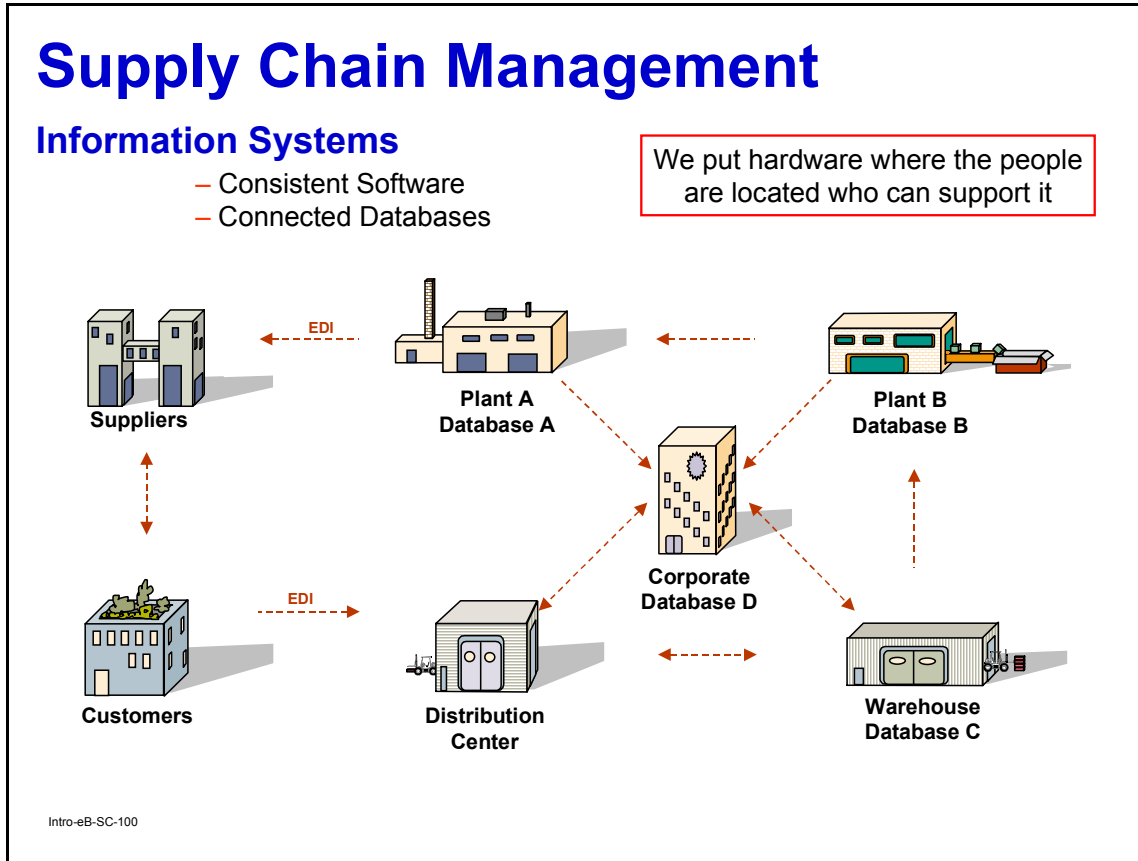
Multi-level EMT manages orders across multiple levels within an organization. Order changes made at the top or bottom of the hierarchy are transmitted up or down to the next level.

Electronic Data Interchange

EDI streamlines communications with suppliers or customers. Release management processes demands from customers to suppliers in terms of schedules rather than discrete orders. EDI transfers them back and forth electronically, providing real-time communication. EDI can handle invoices as well.

Consolidate Results

The corporate financial consolidation functionality accumulates results from all the facilities—even those operating with a different currency and chart of accounts—for easy review. Once again, standardized software ensures that the numbers can be compared, since they are collected using the same baseline.



Supply Chain Management Information Systems

Computers on Wide Area Networks (WANs)

What makes all this work? So far we have talked about this supply chain as if it were all being managed on one computer, in one huge database.

This is possible using leased lines connected to a host, but typically each facility or group of facilities will operate on its own computer and database, connected to the others over a WAN.

Distributed Functions

In MFG/PRO eB, most functions access and update information only in the local database that the user is logged into.

Some distributed functions, however—the central sales, distributed purchasing, operations planning, and DRP functionality—address and update information in multiple databases. With each of these, demand and supply information is automatically communicated between databases.

Many Options

There are literally hundreds of ways of mapping your company to MFG/PRO eB. Every company has a different structure, and everyone will map this structure into the MFG/PRO eB model a little bit differently.

Data Model

The key thing to understand is how the different parts of the model work, and how they interrelate. This will determine how you map your company structure into ours. The model breaks down into roughly these parts:

- Database
- Entity
- Site
- Location

Supply Chain Activities



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Supply Chain Activities

- In the following activity you identify the:
 - Company and data you will be using for the activities
 - Company's supply chain and how it fits into the MFG/PRO eB product strategy

Note If you have been instructed to use sample data, please review the company information now and answer the questions based on this data.

Answer the following questions about your company:

- What is the name of your company?
- What does your company produce?
- Identify one distribution and one manufacturing site.
- Is your product manufactured using discrete or batch processing? Both?



Course Overview

- ✓ Introduction
- ✓ MFG/PRO Navigation
- ✓ Supply Chain Concepts
 - ◆ Set Up MFG/PRO eB
 - ◆ Use MFG/PRO eB
 - ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

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What's Next?

Now that you have an understanding of supply chain concepts and their relationship to the business, we will begin the process of setting up MFG/PRO eB which is covered in the next chapter.

CHAPTER 4

Set Up MFG/PRO eB





Set Up MFG/PRO eB

In this section you learn how to:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ **Set Up MFG/PRO eB**
 - ◆ Use MFG/PRO eB
 - ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

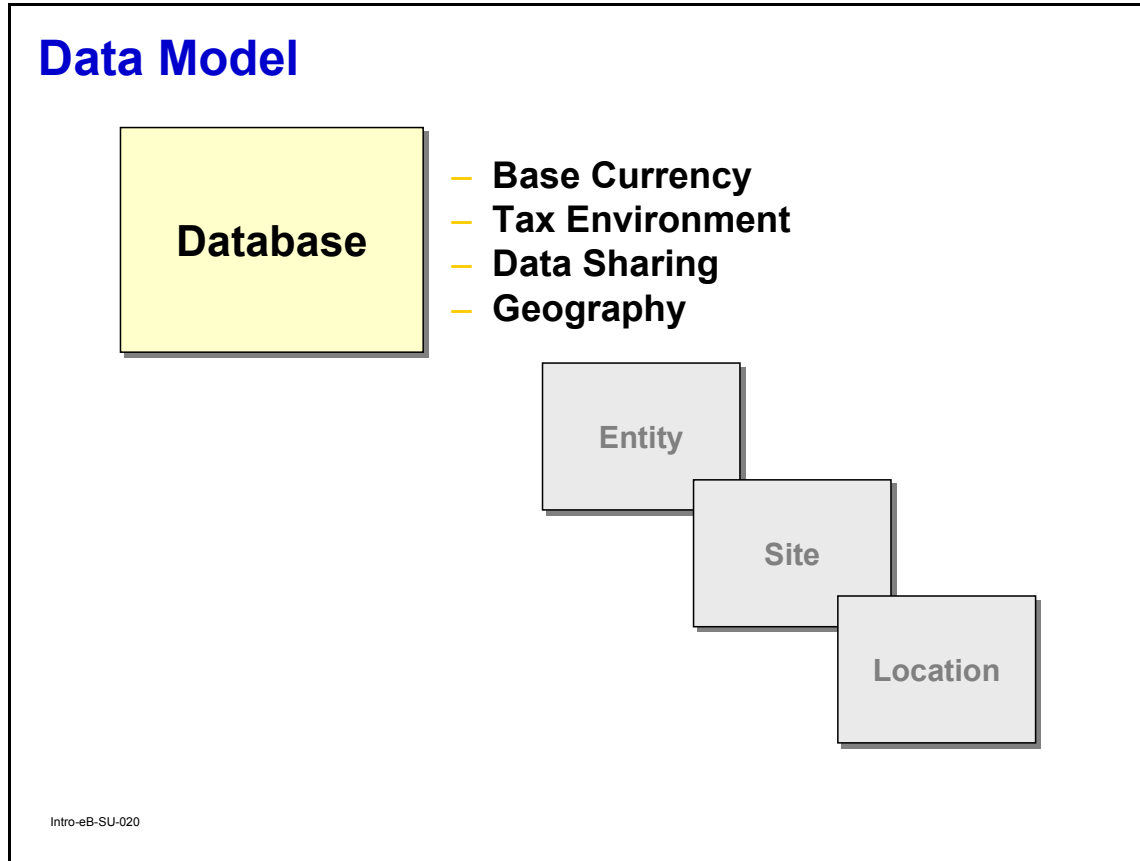
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Set Up MFG/PRO eB

Your implementation will go according to how you choose to apply these concepts; the success of the project depends on your understanding of them. Begin by answering these questions:

- What are the objectives?
- What is the process?
- What are the results and deliverables?
- How will it happen?
- Who will be involved?

A normal MFG/PRO eB implementation begins with system implementation followed by product definition. After these two steps, the remaining modules can be implemented in almost any sequence.



Data Model Databases

By Database

The first implementation question to ask is how many databases are required to model your operation.

A database is a collection of logically related files or records. There can be only one base currency, General Ledger (GL) calendar and chart of accounts per database.

When a multiple database environment is established, MFG/PRO eB has distributed functionality that allows planning and execution across the databases.

In MFG/PRO eB, there are several things that are identified by database.

Currency

Each database has one base currency. All currencies convert to base currency on the financial reports. However, there is a Reporting Currency field which allows you to print reports in whichever currency you specify.

A valid exchange rate for the effective date being used needs to exist in Exchange Rate Maintenance 26.4. This was added functionality to support European Monetary Union (EMU) countries using Euro as well as their own currency.

- Euro Base Currency
 - The new currency of the EMU is the Euro
It was introduced on January 1, 1999. National currencies of EMU member states are no longer considered currencies. Instead they are considered denominations of the Euro.
 - Allows you to be Euro compliant
 - By July 1, 2002, existing national currencies cease to be legal tender
Euro will be the single currency of all participating states in the EMU

Chart of Accounts

- Each database has only one chart of accounts and one General Ledger (GL) calendar.

Master Files

- Each database contains master files—customers, suppliers, and items—that are not separated by company or responsible division.
- Any user who has access to maintenance of the master files has access to maintenance of the information in those files.
- If you require master file security, you need a separate database.

Site Security

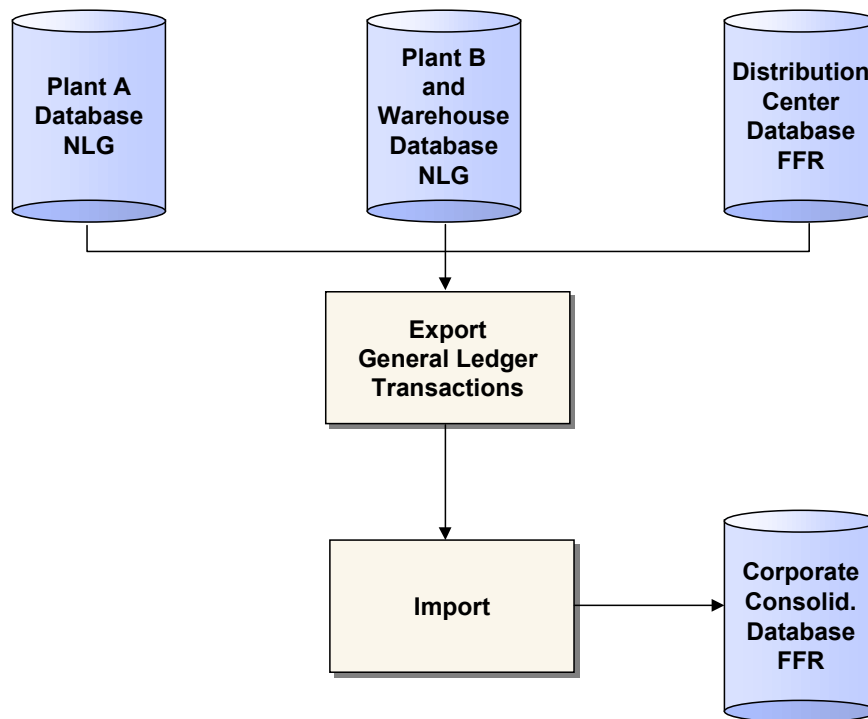
- Within a database, you can set up menu security to prevent users from modifying or viewing information. Site-level security is available only if you have the Compliance module and it does not affect inquiry and report functions.
- Only authorized users can process inventory transactions at sites where site security is used.
- Set up site security in each database.

Database Resides on One Computer

- Geography also determines how many databases are required.

- Remote locations normally operate their own databases and consolidate information by transferring it to corporate.
- Usually a database is not physically spread over multiple computers.

Number of Databases



Intro-eB-SU-030

Number of Databases

Prior to implementation, decide how many databases are needed. Several things influence this decision:

- Geography
- Security
- Reporting
- Financial reporting requirements

Ask the following questions:

1 What is the base currency of each of your facilities?

Transaction activity can be recorded in any currency but is converted to your base currency for financial reporting. You need one database for each currency in which you produce financial reports.

2 Which facilities should be allowed to share information?

Unless you have site security in the Compliance module, all users of a database have access to all information.

If users have access to a maintenance function, in most cases you cannot restrict them to modifying only data that relates to their facility. Financial information, however, can be restricted by entity.

If master files can be shared, you can use one database to manage multiple entities (companies).

3 What consolidation is needed for financial reporting?

Usually, you have one or more additional databases for consolidated financial reporting.

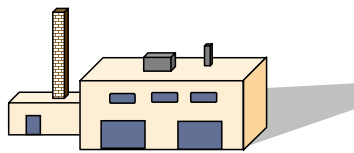
Individual databases maintain financial information and produce financial statements. This information is then accumulated at one or more levels to produce corporate financial statements by exporting and importing transactions between databases.

When transactions are imported from another database, currency is translated based on the exchange rate, and differences in the chart of accounts are reconciled.

Note You can set up extra databases for developing other types of financial statements or levels of consolidation.

Entities and Sites

Entity 1000

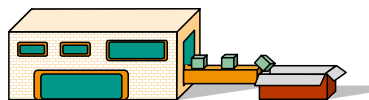


Plant A

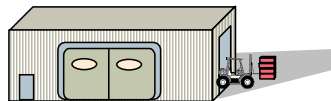
♦ **An entity is a business that publishes financial statements and files tax returns**

♦ **A site is a unit used for inventory planning and control**

Entity 2000



Plant B



Warehouse

Intro-eB-SU-040

Entities

The number of sets of financial statements produced by one database is determined by the number of entities you set up. An independent unit for financial reporting purposes, an entity:

- Generates a separate balance sheet and income statement
- Plans budgets
- Is assessed for taxes

All GL transactions are posted by entity.

The primary entity is the default entity for GL transactions. There is no limit to the number of entities that can exist in a database.

An entity can be a single facility (Plant A) or multiple facilities (Plant B and Warehouse, for example).

Multiple facilities maintained in a single database must share the same chart of accounts and GL calendar. Separate financial statements can be produced for each one.

In addition, consolidated statements can be produced that combine the results of two or more entities maintained in that database. This does not require the export or import of data into a separate consolidation database.

A consolidation database is required only when consolidating financial information for entities managed in different databases.

Note All information for one entity should be contained within a single database.

Sites

A site is an inventory and planning concept. All inventory is stored by site and all planning is done by site. Each site belongs to one—and only one—entity, but each entity can have more than one site.

Most functions work within one site—manufacturing orders expect to find all their components at the same site. MRP or DRP calculates requirements one site at a time.

A few functions deal with multiple sites (multisite purchase or sales orders, distribution orders, and distributed inventory inquiries, for example).

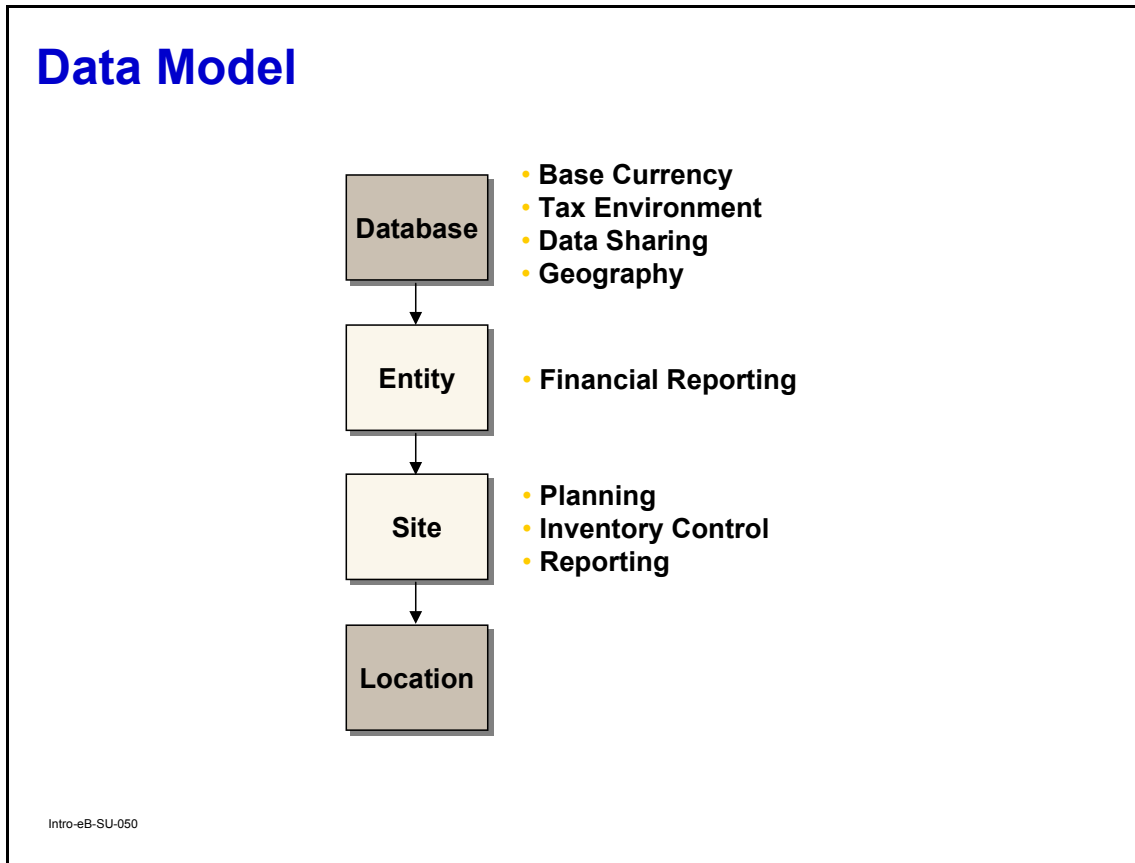
Inventory and Planning by Site

Within any one financial entity there can be one or more physical sites.

In MFG/PRO eB, a site is an operating unit that manages its own inventory and production independently of other sites, even if those sites are in the same facility. (Plant B and Warehouse would each be a site, for example.)

However, sites do not need to:

- Produce separate financial statements
- Handle accounts receivable or accounts payable separately from other sites



Data Model

Entity and Site

What makes this all work in MFG/PRO eB is the multiple database concept. Each site belongs to an entity for financial reporting purposes and to a database for physical data storage.

In any implementation there can be multiple databases.

- Each database can contain multiple entities
- Each entity can contain multiple sites
- Each site can belong to one—and only one—entity and database

In MFG/PRO eB, these relationships are set up using two functions:

- Database Connection Maintenance 36.6.1
 - Lists databases in the network and the technical details used by the system to access them
- Site Maintenance 1.1.13
 - Each site is associated with one database.
 - Whenever you process a transaction for that site, the system determines the database for that site and attempts to access the information for that site over the network.
 - It must use the database connection information and see whether you are connected to it. If you are connected, the communication is automatic. If you are not connected, an error displays and you cannot continue.
- Connections can be established:
 - Automatically at start-up, or
 - Manually using Database Connect 36.6.13

Note To avoid any conflicts, the list of databases, entities, and sites should be the same in all databases. This ensures that database names and site and entity codes will be unique across the network, not just that database.

Setup Activities



Intro-eB-SU-055

Setup Activities

Business Simulation: Your newly formed company has received a loan for start-up capital.

- In the following activity you:
 - Set up your System/Account Control file
 - Enter an entity for your company
 - Set up a bank for transacting business
 - Enter the company financing in GL
 - Print a beginning balance sheet for your company

Set Up Printer

Set up your printer in Printer Set-Up Maintenance 36.13.2.

Enter an Entity

- 1 Scroll through the preexisting records in Entity Code Maintenance 25.3.1 and modify the entity that is flagged as the primary entity by setting the flag to No.
- 2 Use Entity Code Maintenance to add a record for your entity. Flag this entity as the primary entity. MFG/PRO eB allows only one primary entity per database.
- 3 Modify the System/Account Control File 36.1 to have your entity be the default entity for the database.

Set Up a Bank for Your Entity

- 1 A new bank will do business with your business entity. Enter a record for it in Bank Maintenance 28.9.1. Make the bank currency the same as your base currency, and make the entity the same as your company entity.
- 2 Modify the Accounts Payable Control File 28.24 to use the bank as the default bank for this database.

Enter Company Financing in General Ledger

- 1 Verify that the General Ledger has the current year set up in GL Calendar Browse/Inquiry 25.3.5. If not, use GL Calendar Maintenance 25.3.4 to enter a calendar for the current year starting with period one (add 12 periods).
- 2 Add a record in Standard Transaction Maintenance 25.13.1 to document the \$10,000 loan received from the bank.

Line	Account	Amount
1	1040 (Cash)	10,000.00
2	2600 (Long Term Debt)	-10,000.00

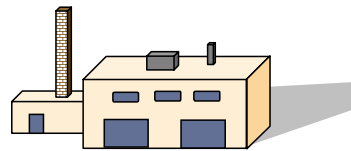
- 3 Post the transaction to GL by printing the Transaction Post 25.13.7 program.
- 4 Print the transaction post report to your Window.
- 5 Print a balance sheet 25.15.8 for your entity with today as the ending date.
If you want to preview a report or do not want to waste paper, note that reports can be printed to your Window.

Checkpoint

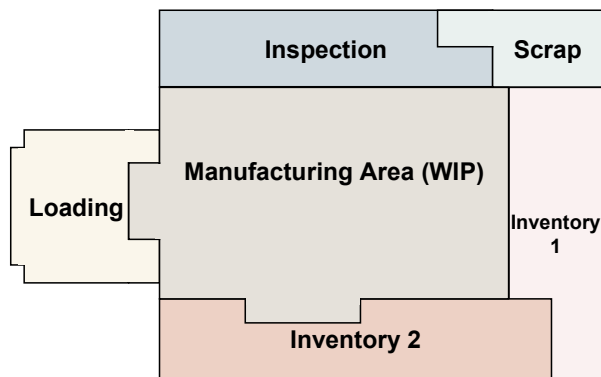
- You should have:
 - A \$10,000 balance in Cash
 - A \$10,000 balance in Long Term Debt
 - No other amounts on the balance sheet

Locations

- A site can have multiple locations
- A location is a place where inventory is stored



Plant A



Intro-eB-SU-060

Locations

Locations identify areas of a site where inventory is stored. Each location's parameters identify what can be stored there and how that inventory can be used.

Every inventory transaction must have a site and location. Both default from the item master.

You can define the same location code for multiple sites—recommended if you use an item at more than one site because there is only one default location per item (not per item and site).

In MFG/PRO eB, each site can be split into locations—the places where inventory is stored. All inventory planning and control is done at the site level.

Planning normally considers the locations within a given site (although some can be designated non-nettable). Each time you set up a location in Location Maintenance 1.1.18, assign it to a specific site.

Locations do not have to be predefined. If you operate with a four-walls type inventory, you can simply receive inventory in and out of stock.

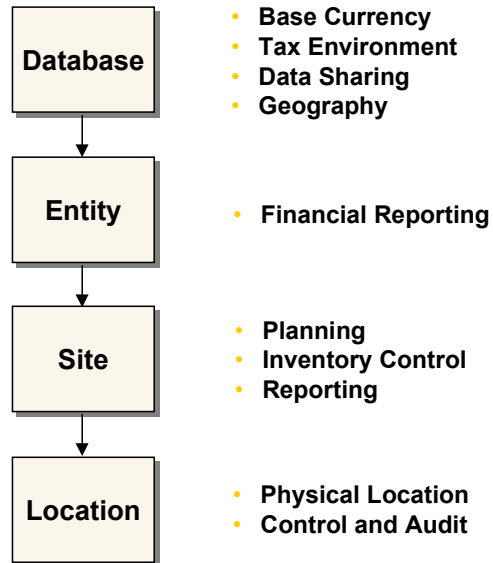
However, most companies need to have at least a few predefined locations to handle special situations such as:

- Control capabilities
 - Certain items are assigned to certain locations
- Location type
 - Some locations have particular characteristics—temperature, humidity—that are required for storing certain items
- Single lot
 - Some locations are dedicated to items or lots that cannot be mixed, and are flagged as Single Lots Only
- Inventory status
 - Materials in some locations should not be considered available for use because they are reserved or damaged. This is controlled by assigning each location a status.

During implementation it is important to think about the location code you assign to each location, partly because MFG/PRO eB inventory reports can be run for a range of locations such as 100 to 199.

More important, MFG/PRO eB picking logic uses the location code to determine the sequence for items picked.

Data Model – Review



Intro-eB-SU-070

Data Model Review

Database

To summarize, a database is a physical set of tables. All users who have access to that database have access to the data in those tables (subject to Menu, Field, and Compliance Site Security).

- For each database, there is one:
 - Chart of accounts
 - GL calendar
 - Tax environment
 - Financial reporting currency

Entity

An entity is a financial reporting concept. Balance sheets and income statements are produced by entity. There can be multiple entities in one database. Consolidated reports can be focused by selecting a range of entities to report.

Site

A site is an inventory planning and control concept. All inventory is stored by site, and all planning is done by site. Each site belongs to only one entity, but each entity can have more than one site. Almost all reports produced in the system are selected and sorted by site.

Location

Within a site there can be multiple inventory locations. These are used to physically identify and control individual items in stock. Inventory reports normally are selected and sorted by location.

Setup Activities



Intro-eB-SU-055

Setup Activities

In the following activity you:

- Add an inventory status record
- Set up a manufacturing and distribution site
- Set up inventory locations at your manufacturing and distribution sites
- Enter your company address

Add an Inventory Status Record

- 1 Using Inventory Status Code Maintenance 1.1.1, review any status codes previously set up in your demo database (scroll through the records or use a drill down icon).
- 2 Add two new status codes with the following settings:

Status Code:	OI-NO	Returns
Available:	Yes	No
Nettable:	Yes	Yes
Overissue:	No	No
Restrict:	ISS-DO	ISS-SO

Status codes will be discussed in detail with inventory.

Set Up a Manufacturing and Distribution Site

- 1 Enter a record for your manufacturing site and for your distribution site in Site Maintenance 1.1.13. Reference the inventory status OI-NO on both records.
- 2 Using Calendar Maintenance 36.2.5, set up a shop calendar for each of your sites. Normally, both sites work 5 days per week (Monday through Friday), 8 hours per day.

Set Up Inventory Locations at Your Sites

- 1 Use Location Maintenance 1.1.18 to add the following records to your database:

Site	Location	Inventory Status
Manufacturing	Raw Materials Inventory	OI-NO
Manufacturing	Finished Goods	OI-NO
Distribution	Finished Goods	OI-NO
Distribution	Returned Materials	Returns

Enter Your Company Address

- 1 Use Company Address Maintenance 2.12 to create records for your company. The address code should be the same as each of your site codes, and the tax zone should be USA. You will now have two company address codes.
- 2 Change the ~screens record in Company Address Maintenance to your company name.
- 3 Exit Company Address Maintenance.
Your company name should appear at the top of the screen.
- 4 Reenter Company Address Maintenance and modify the ~reports record to YOUR name. This will cause your name to appear where the company name normally appears on printed reports.

Database Entity and Site Discussion

Consider the company Quality Biscuits, PLC, headquartered in London, England. Consolidated corporate financial statements are expressed in pounds sterling.

There are two manufacturing divisions, one in Birmingham, England and one in Los Angeles, U.S.A.

Distribution centers are located in Los Angeles, New York, and Atlanta (USA). Each reports to the Los Angeles manufacturing division.

Other regional distribution centers are in Toronto (Canada), Mexico City (Mexico), and Hong Kong. The Hong Kong facility reports in Hong Kong Dollars (HKD).

How many databases, entities, and sites do you think they will need? (A picture may help; use the space below for sketching out ideas.) Consider the minimum number of databases they can function with.

Confirm your answers on page 146.

36.1 – System Account Control File

The screenshot shows the 'System/Account Control File' window with the following settings:

- Verify GL Accounts: yes
- Base Currency: USD
- Entity: 1000
- Bank Acct Validation: 11
- Default System Language: US
- Audit Trail: yes

Below these settings is a section for 'Multiple Currency Accounts' with the following values:

- Unrealized Exchange Gain Acct: 1035
- Unrealized Exchange Loss Acct: 1036
- Realized Exchange Gain Acct: 1037
- Realized Exchange Loss Acct: 1038
- Exchange Rounding Acct: 1039

To the right, the 'Sales Accounts' window is open, displaying a list of accounts and their corresponding numbers:

Receivables:	1200
Sales:	3000
Sales Discount:	3900
Sales Tax:	2400
Sales Tax Absorbed:	5950
Sales Terms:	3910
Sales Cash:	1040
Sales Returns:	5055
Sales Finance:	3800
COGS Material Acct:	5050
COGS Labor Acct:	6860
COGS Burden Acct:	6480
COGS Overhead Acct:	6495
COGS Subcontract Acct:	5070
Sales Freight Accrued:	2350
Sales Freight Applied:	4120
Terms Late Interest:	3810

Intro-eB-SU-080

System Account Control File

Menu Number 36.1

System administration, where an MFG/PRO eB implementation begins, includes Manager Functions, conversion routines and utilities, as well as user functions to help customize MFG/PRO eB for each company and its users.

The System/Account Control File is the control file for the entire database. It is generally set up once, then left alone.

36.1 – System Account Control File

System/Account Control File

User Menu Edit Queue Options Help

Accounts Payable

Payables:	2100
AP Discount:	5200
AP Tax:	1400
AP Tax Retained:	2450
Expensed Item Receipts:	2250
Expensed Item Usage Var:	5110
Expensed Item Rate Var:	5120

Department

Cost Of Production:	6300		
Labor:	6500		
Burden:	6400		

Product Line

Inventory Acct:	1500		
PO Receipts Acct:	2200		
Purchases:	5100		
Overhead Appl Acct:	6490		
Scrap:	5800		
Work in Process:	1600		
Inv Discrep Acct:	5900		
Cost Revalue Acct:	1550		
Floor Stock Account:	1560		

Variances

PO Price Variance:	5000		
AP Usage Variance:	5010		
AP Rate Variance:	5020		
Method Variance:	6200		
Transfer Variance:	5030		
Material Usage Var:	5045		
Material Rate Var:	5040		
Labor Usage Var:	6850		
Labor Rate Var:	6800		
Burden Usage Var:	6470		
Burden Rate Var:	6460		
Subcontract Usage Var:	5065		
Subcontract Rate Var:	5060		
Mix Var:	6100		

Service Accounts

Service Labor:	6550		
Service Overhead:	6491		
Service Expense:	7400		
Expense Due:	7410		
Service Returns:	5053		

Intro-eB-SU-081

Shop Calendar

Each database must have at least one default shop calendar. It can be set up by site, work center, and machine. The shop calendar is used throughout MFG/PRO eB, but primarily by planning and manufacturing to determine order dates and capacity.

Security

You can use MFG/PRO eB to set up several levels of security: Menu-level security prevents users' access to a particular program or menu option; entity security prevents updating of transactions by entity; field security prevents changing data in a particular field; GL Account Security prevents unauthorized users from updating GL accounts. Site security is available if you have the Compliance module. Most security can be set up by user ID or group.

Generalized Codes

Generalized codes enable users to determine values for fields and have the system validate whether or not an acceptable entry was used during data entry. Generalized codes can be displayed as a look-up browse when the user's cursor sits on the field.

User Interface

You can customize the MFG/PRO eB interface with MFG/PRO eB for Windows by, among other things, creating drill-down browses, assigning menus to buttons on the tool bar and to the user menu, and setting up menu substitutions. Individual users can select menu styles and do other customizing.

Printers and Reporting

To print reports, you must have an output destination, Printer, defined in Windows—your default Windows printer. In the character interface you must assign the printer a unique device name, device path name, and so on. Some common printer types are predefined and can be associated with your printer. An output file can be sent to a printer, a terminal, or a disk file.

Set Up

Set up the System/Account Control File first. It establishes the default GL accounts, determines how some functions operate, and defines the settings for an entire database. It is not site specific. It determines:

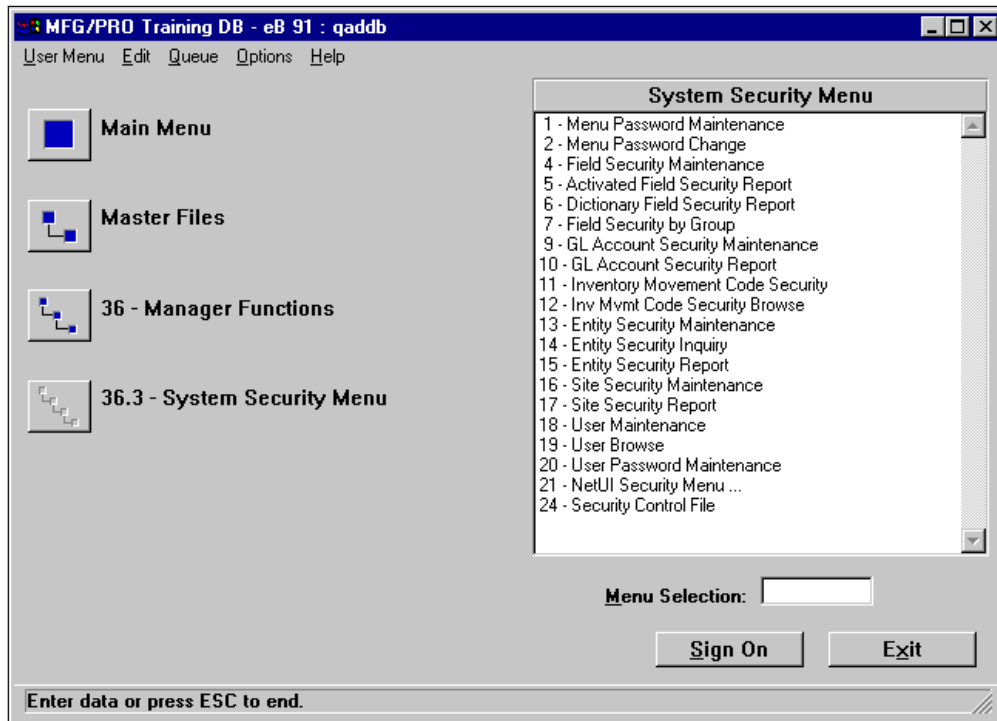
- Account validation
 - If Verify GL = Yes, the system verifies that GL accounts are valid, active accounts (as set up in the GL module), and that the effective date entered on a transaction lies within a valid open accounting period
- Base currency
 - The currency identified as the base currency is the company's functional currency. Transactions entered in other currencies are converted to the functional currency for financial reporting.
- System entity
 - This is the default entity used throughout the system. Whenever you add a new site or enter a financial transaction, this entity displays for you to accept or choose another.

- Default Accounts
 - Fill in all account groups—no accounts should be left blank

Note Once established, System/Account Control File values should not be changed.

Most of the modules have control files. During an implementation, you should be familiar with the control file settings even if you are not ready to implement a particular module. The flags may affect functions in more than one module.

36.3 – System Security



Intro-eB-SU-090

System Security Menu

Menu Number 36.3

Menu Access and Account Security

When you first started MFG/PRO eB, you had to enter a user ID. The ID determines which menu functions you can access.

Each menu function is assigned the user IDs that are allowed to access that function. If your user ID is not in that list, that menu function will not display on your screen.

By default, your user ID also controls your access to individual GL accounts if security for them is set up. When it is, you can enter only transactions that involve accounts you have been given

permission to access. This security prevents typographical errors—you cannot enter data in an account you are not supposed to access—and gives system management an extra layer of control.

To control access in MFG/PRO eB, use the Security Control File 36.3.24 to set up whether security is by user ID, by password, or both.

You can also set up menu and account security by user group.

- 1 Set the Security Option parameter in the Security Control File 36.3.24 to User ID or both.
- 2 Next, record user IDs and the user groups that each belongs to in User Maintenance 36.3.18.
- 3 Finally, restrict access in Menu Password Maintenance 36.3.1 and GL Account Security Maintenance 36.3.9 using user IDs or user groups.

Entity Security

Entity Security Maintenance 36.3.13 provides another level of security which can be used to restrict particular users from entering accounting activity for any company other than their own. Entity security is set up by user ID. Each user ID can access data from one or more entities.

Field Security

Some fields can be password-secured in the data dictionary by specifying a security validation procedure for those fields. Use the Dictionary Field Security Report 36.3.6 to get a complete list of fields that can be password secured.

Once passwords are attached to any of these fields using Field Security Maintenance 36.3.4, only users with valid user IDs can enter or change data in these fields. Note that this does not prevent other users from seeing the current value in the field; it just stops them from changing it.

Site Security

Site Security Maintenance 36.3.16 enables you to control user access to inventory transactions at each site. Only authorized users can process transactions where you use site security. User access managed by user or by group site security is only available if you have the Compliance module.

To secure your system properly without limiting user functionality, use a combination of the following security features:

Security Secured by

System Access: User ID, password, both

Menu: User ID, group

GL Account: User ID, group

Entity: User ID

NetUI Security

User access to MFG/PRO eB from the NetUI can be controlled by standard MFG/PRO eB security features, or users can be defined in User Group Security Maintenance 36.3.21.18 and User Maintenance 36.3.18 in order to log into MFG/PRO eB from the NetUI.

Inventory Movement Code Security

Inventory Movement Code Security 36.3.11 is a menu level routine that lets you grant or deny user access to individuals and groups, when using a specific inventory movement code at a particular site.

When you create shippers, Inventory Movement Code Security determines which inventory movement codes are available, based on the Ship-From site of the shipper. It also determines if a user can select an existing shipper for maintenance. It has no effect on adding a line item from a sales order or other originating transactions to a shipper.

If a user is a member of multiple groups—one that is granted access and one that is denied access—the access denial takes precedence. If you do not enter any users or groups, then all users have access.

You can delete Inventory Movement Code Security records at any time.

Setup Activities



Intro-eB-SU-055

Setup Activities

In the following activity you:

- Set up field validation using generalized codes
- Set up a look-up browse to view the valid data for a field

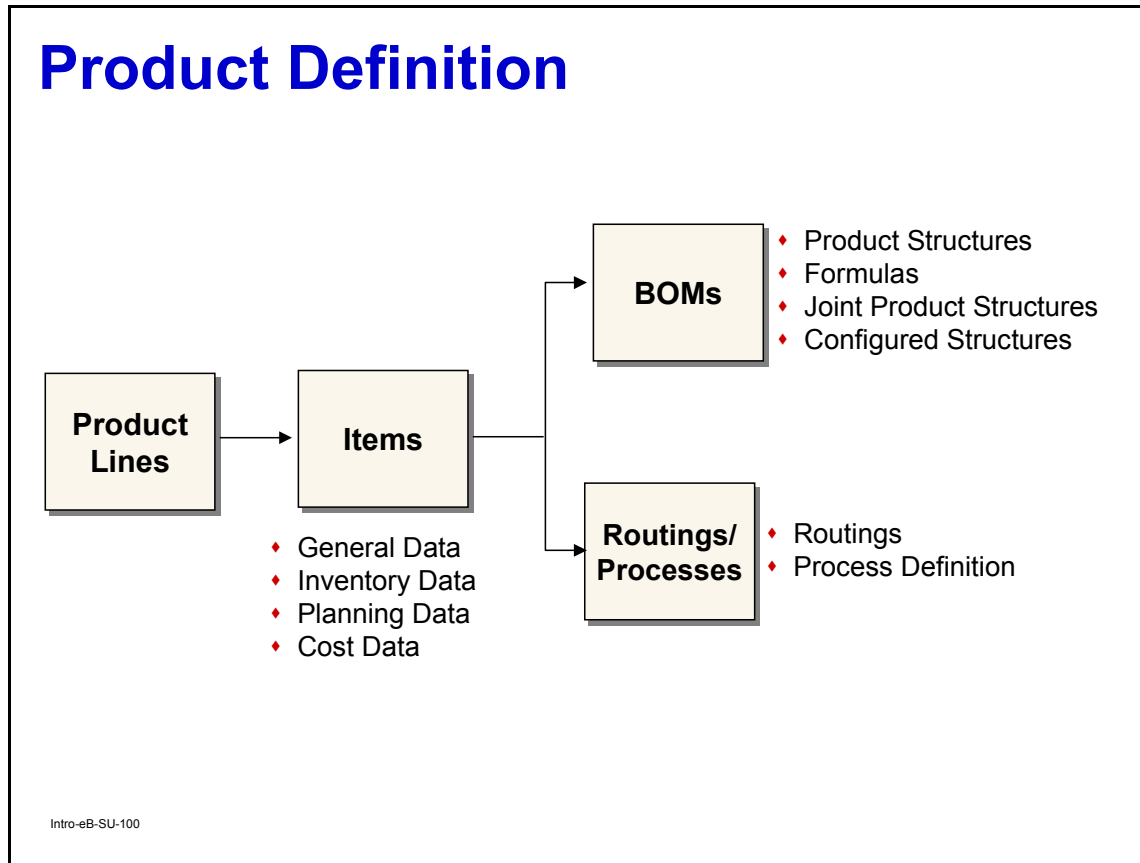
Set Up Field Validation Using Generalized Codes

- 1** Enter Item Master Maintenance 1.4.1, select item 04-0005, and go to the Promo Group field.
- 2** Click on the look-up browse icon and review the list of possible Promo Groups that have been set up for this field. Close the window.
- 3** Hold down Control and F. The field name appears in the message area; note the name.
- 4** In Generalized Codes Maintenance 36.2.13, type the name of the field (pt_promo). Press Enter, and use your next/previous keys to scroll through any existing records.
- 5** Add a new record for pt_promo by entering the following:

Field name: pt_promo

Value: <leave blank>

Comments: non-APM Item
- 6** Save your changes and exit.
- 7** Reenter Item Master Maintenance, select 04-0005, and go to the Promo Group field. Click on the look-up browse icon and review the list of possible item types. The Promo Group you created should now appear on the list.



Product Definition

Implementation raises questions about product definition. It often becomes a battle between the Engineering and Manufacturing departments on how much detail is enough.

The product definition should be simple, but reflect the true process and structure of the items in question.

Keep enough detail to provide accounting control and engineering information for process improvement, but not so much detail that reporting becomes more time consuming than the process itself. Many features in MFG/PRO eB help to alleviate this burden.

To establish a product definition, first establish product lines, then assign them to each item. Each item must have an associated product line to capture inventory costs and movement. Each item may or may not have a BOM or routing associated with it.

- Bills of materials quantify how much of an item is required to produce the parent item
- Routings quantify where and how the product is made

1.2.1 – Product Line Maintenance

Product Line Maintenance

Use Menu Edit Queue Options Help

Product Line: 1000

Description: Pencil Products

Taxable: no

Tax Class:

Default Sub-Account:

Default Cost Center:

Override: no

Override: no

Inventory Accounts

Inventory Acct:	1500		0100
Inv Discrep Acct:	5900		0100
Scrap Acct:	5800		0100
Work in Process Acct:	1600		0100
Method Variance Acct:	6200		0100
Cost Revalue Acct:	1550		0100

Sales Accounts

Sales Acct:	3000		0100
Sales Disc Acct:	3905		0100
Exempt Sales Acct:	4400	0100	
COGS Material Acct:	5050		0100
COGS Labor Acct:	6860		0100
COGS Burden Acct:	6480		0100
COGS Overhead Acct:	6495		0100
COGS Subcontract Acct:	5070		0100

Purchasing Accounts

Purchases Acct:	5100		0100
PO Receipts Acct:	2200		0100
Overhead Appl Acct:	6490		0100
PO Price Var Acct:	5000		0100
AP Usage Var Acct:	5010		0100
AP Rate Var Acct:	5020		0100

Work Order Accounts

Floor Stock Account:	1560		0100
Material Usage Var:	5045		0100
Material Rate Var:	5040		0100
Mix Var:	6100		0100
Cost of Production:	6300		0100
Subcontract Usage Var:	5065		0100
Subcontract Rate Var:	5060		0100

Service Accounts

Service Labor:	6550		
Service Overhead:	6491		
Service Expense:	7400		
Expense Due:	7410		
Service Returns:	5053		

Intro-eB-SU-110

Product Line Maintenance

Menu Number 1.2.1

Product lines are used to group items for planning, reporting, and accounting.

Product lines group items by similarities in manufacture or application. For operations planning, product lines can identify items planned as a group due to similarity of manufacturing process, sales channel, or other characteristic.

Items must belong to exactly one product line. Product lines identify which GL accounts will be used for sales, inventory, purchasing, work orders, or service transactions.

Add further detail to inventory and sales accounts by assigning different accounts for each product line/site/location combination. Inventory stored in a rework location at a site can be accounted for separate from finished goods.

Different product lines, sites, customer type, channel combinations can be assigned different GL accounts for sales, sales discounts, and cost of goods sold (COGS). Establish inventory accounts in Inventory Account Maintenance 1.2.13 and Sales Account Maintenance 1.2.17.

Item Information

Product Line
Unit of Measure
Group and Type

Inventory Data

Lot/Serial Control
Site
Location
Location Type
ABC Class

Planning Data

Pur/Mfg Code
Order Policies
Order Modifiers
Planning Lead Times
Buyer/Planner
Supplier

Cost Data

Price
GL Cost
Current Cost

Intro-eB-SU-120

Item Information

Item information must be entered for every item you use or produce, at every site using that item. Item Master Maintenance 1.4.1 or Item Data Maintenance 1.4.3 establishes the basic item data. To record site-specific information, use:

- Item-Site Inventory Data Maintenance 1.4.16
- Item-Site Planning Maintenance 1.4.17
- Item-Site Cost Maintenance 1.4.18

Every item is identified by an item number. This item number is the same for all sites, as is some of the other identifying information, such as:

- Unit of measure

- Product line
- Group
- Type
- Location
- ABC class
- Size
- Weight
- Most other inventory information
- Base price

Prior to implementation, review and decide what to enter in the following fields:

- Unit of Measure
 - Used by planning and inventory issues. Other units of measure can be used for purchasing and sales transactions, but all inventory balances will appear in this unit of measure.
- Product Line
 - Used to group items for planning, reporting, and accounting. Each item can be assigned to one and only one product line.
- Item Group and Type
 - While product line is the primary category, Group and Type are also used to categorize items for reporting.
- Location
 - Location where item is normally stored. It appears as the default for all inventory transactions, at any site. Usually it can be left blank in a multisite implementation, unless the same location codes are used at each site.

Item planning data and cost information can be set up by item and site. Purchased items can designate a PO site, DRP items designate a network code, and manufactured items designate a BOM (bill of materials) and routing code. These can be different at each site.

Costs must be defined at every site where the item is used.

Item Cost Development

General Ledger Cost

- Standard
- Average

Current Cost

- Average
- Last
- None

Elements

Material
Labor
Burden
Overhead
Subcontract

Intro-eB-SU-130

Item Cost Development

The cost of a manufactured item can be calculated based on its standard bill of material and routing. There are this-level and lower-level costs, and each is split into five standard categories: material, labor, variable burden, fixed overhead, and subcontract. An unlimited number of additional categories can be set up if you have the Cost Management module.

Each item has a minimum of two costs.

- 1 Current cost is today's cost, which the system can maintain as the Last or Average cost (purchase, labor, burden, and subcontract).
- 2 GL cost is the cost used on all GL transactions.

As a default, these are standard costs, but they can be system-maintained as average costs by using Cost Management. Each site can then use a different costing method.

Standard Costing

When using standard costing, standards are updated infrequently—annually or quarterly, depending on the volatility of manufacturing costs. GL cost is used for all GL transactions. Variances between GL and actual manufacturing and purchasing costs are calculated and posted to the general ledger.

Average Costing

When using average costing, an item's average cost is updated each time a receipt is processed. The new cost is a simple average:

$$[(\text{old qty on hand} \times \text{old avg cost}) + (\text{receipt qty} \times \text{receipt cost})] / \text{new qty on hand}$$

If quantity on hand is negative, it is treated as zero.

Because costs change with each receipt, no manufacturing or purchasing variances can be calculated.

Setup Activities



Intro-eB-SU-055

Setup Activities

In the following activity you:

- Set up a product line
- Modify Inventory Control File
- Define end item and component Items

Set Up a Product Line

- 1 Set up a product line for your items in Product Line Maintenance 1.2.1 (use sample data if applicable).
- 2 Review the account numbers. Where did this default data come from? Use the default accounts and update the record.

Modify Inventory Control File

- 1 Use the defaults in the Inventory Control File 3.24, except the following:

Current Cost: Last

Default Site: Your Manufacturing Site

Define End Item and Component Items

- 1 Use Item Data Maintenance 1.4.3 to add your end item and component items to your database. Use product line 1000 (or the product line you set up earlier from your sample data). The unit of measure should be EA (or the one you issue for making the end item in the sample data).
- 2 Use Item Inventory Data Maintenance 1.4.5 to define item inventory data:

Site: Manufacturing Site

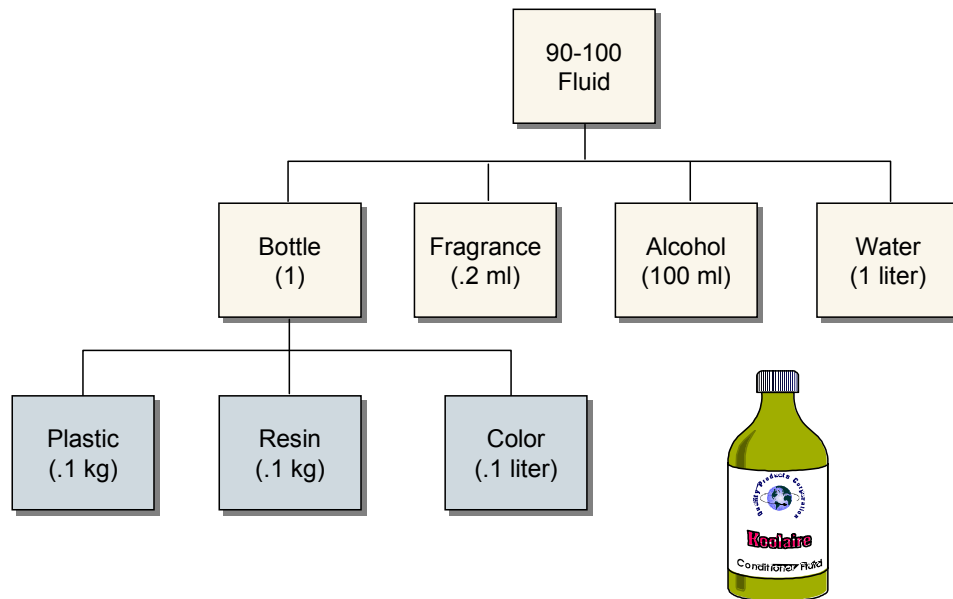
Location: Primary Stocking Location
(Finished Goods for the end item;
Raw Materials for component items)

- 3 Define the planning data for your items in Item Planning Maintenance 1.4.7:

	End Item	Component Items
Plan Orders:	Yes	Yes
Order Policy:	POQ	POQ
Pur/Mfg:	M(anufactured)	P(urchased)
Pur LT:	blank	5 days

- 4** Enter the price of your end item using Item Cost Maintenance 1.4.9.
Price is the amount you charge your customers for the item. Do not add any costs to your end item at this time. These costs will be calculated later, based on the cost of your components and your manufacturing labor and burden.
- 5** Add the purchase cost of your component items in Item Cost Maintenance (Master Files, 1.4.9), in the Current Cost Set (not the GL Cost Set), in the material cost field.
- 6** Review each of your items using Item Master Maintenance 1.4.1.
This is a composite program representing the detail previously entered.

Product Structures



Intro-eB-SU-140

Product Structures

Once items are identified in the system, you set up product structures and formulas to identify the physical makeup of manufactured products in the system. Product structures define the components used in the manufacture of any item; formulas define the ingredients used. These are vital to the planning process.

Note In general, product structures and formulas work in the same way, so we will refer to both as bills of materials (BOMs).

Parent/Component Relationships

The system uses BOMs—each a collection of parent-component relationships—for the planning and control of manufacturing.

For example, look at the bottle of conditioner fluid page 116. The plastic bottle is made from plastic pellets, resin, and colorant. In the bottle part of the BOM, the plastic bottle is the parent and the three raw materials are the components.

In MFG/PRO eB you define these relationships in either Product Structure Maintenance 13.5 or Formula Maintenance 15.5.

Parent in One BOM/Component in Another

The bottle is filled with fragrance, alcohol, and water to make the final product: a bottle of conditioner fluid. In this part of the BOM, the finished bottle of conditioner fluid (item 90-100) is the parent and the bottle is a component. The other ingredients—fragrance, alcohol, and water—are also components in this BOM.

Note that the bottle is a parent item in one BOM and a component in another. This is called a multilevel BOM.

BOM Code

Different formulas for different batch sizes of product, or alternate product structures used in different circumstances, require multiple BOMs for the same item. This is done by adding a BOM code in Product Structure Code Maintenance 13.1 or Formula Code Maintenance 15.1 and then using this BOM code as the parent in Product Structure Maintenance 13.5 or Formula Maintenance 15.5.

13.5 – Product Structure Maintenance

- ♦ BOM Code
- ♦ Multilevel
- ♦ Reference ID
- ♦ Quantity Per Unit
- ♦ Quantity/
Percent of Batch
- ♦ Scrap %
- ♦ Lead Time Offset
- ♦ Substitutes
- ♦ Alternates

Product Structure Maintenance

User Menu Edit Queue Options Help

Parent Item: 10-10000
Description: OASIS(TM) COOLING SY

Component Item: 22-100
Rev: AA
Reference: Power Cable
Start Effective: / /
End Effective: / /
Qty Per: 1.0 EA
Scrap: 0.00%
LT Offset:
Op:
Sequence Number:
Forecast: 100.00%
Option Group:
Process:
Remarks:

F1=Help F2=Go ESC=End F5=Delete Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-SU-150

Product Structure Maintenance

Menu Number 13.5

Effective Dates and Quantity Per

The elements that make up a BOM have a range of effective dates (so new components can be phased in and others phased out) and each parent/component relationship identifies the quantity used of the component per parent—that is, the number of units of the component required to make one unit (or batch) of the parent.

In a formula, quantity per can be expressed per unit, per batch, or as a percent of batch. Each component can also designate a scrap percentage and a lead time offset for planning.

Backflush Operation

Each component can be associated with an operation. This is vital if you are using Repetitive, because components are backflushed by operation. When an operation is reported complete, each of the components associated with that operation is issued from stock.

BOM Codes

Usually the parent code of a product structure or formula is the item number itself, but generic BOM codes can be defined and used as the parent. This enables you to set up generic bills to apply to multiple items, or multiple bills for the same item.

As with routings, each item-site is assigned a standard BOM code to designate the normal way this product is manufactured. This is the bill used by costing and planning.

By default, if no BOM code is defined in the item planning data, MFG/PRO eB assumes that the BOM code is the same as the parent item number's for planning and costing purposes.

Setup Activities



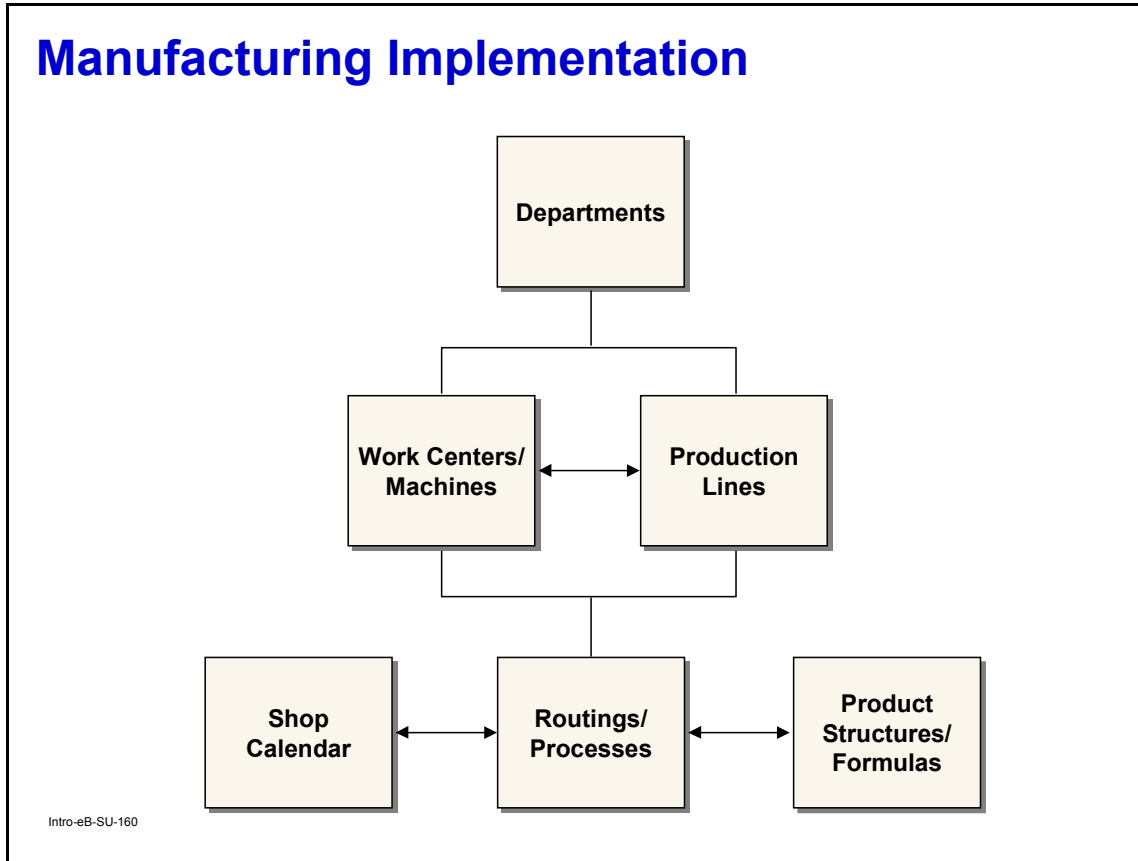
Intro-eB-SU-055

Setup Activity

In this activity you define parent/component relationships for your items.

Define Parent/Component Relationships

- 1 Using Product Structure Maintenance 13.5, define the parent/component relationships for your product.
Use Formula Code Maintenance 15.1 if you are defining a formula or recipe.
Make sure the quantity per field on the components is correct, based on the component unit of measure.
- 2 Review the product structure in Product Structure Inquiry 13.6.



Manufacturing Implementation

Work Centers/Routings

Once you have set up your items in Item Master Maintenance 1.4.1, you need to identify where and how they are manufactured. This is done by setting up manufacturing departments, work centers/machines, and production lines, then attaching manufacturing operations to each of these items.

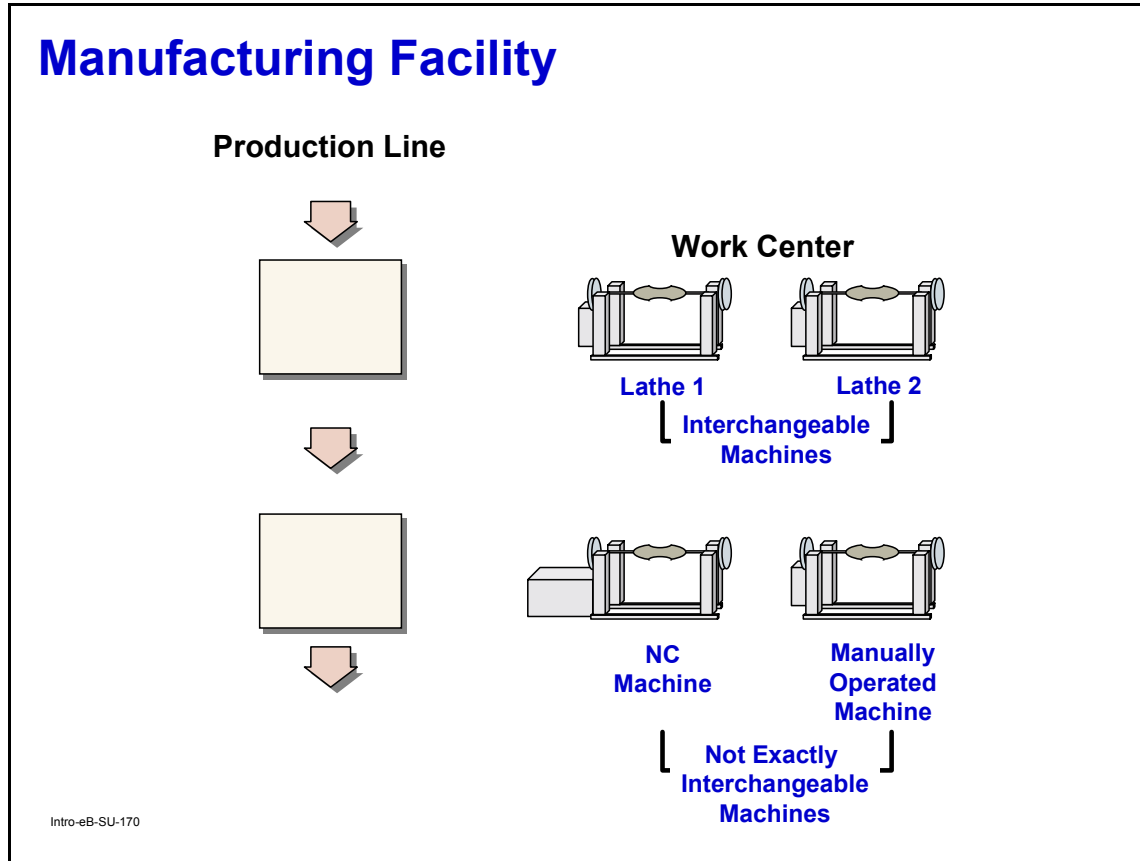
Associate each routing or process operation with a particular manufacturing work center/machine. Routings normally are set up for discrete items (television sets and bicycles, for example) while processes are set up for batch items (such as, ice cream and plastic bottles). Routing operation times are entered per unit; process operation times are per batch.

Product Structures and Formulas

Product structures are associated with discrete items, and identify the quantity of each component needed to manufacture one unit of an item. Formulas identifying ingredient usage as a quantity per batch or percent of batch can be attached to manufactured or purchased items, as can routings. Items that normally are manufactured can be purchased, and purchased items can be manufactured.

Shop Calendar

You will also set up shop calendars in Calendar Maintenance 36.2.5. One calendar may apply to the whole company, or several may be set up by site, work center, and machine. The calendar is used by planning and scheduling.



Manufacturing Facility

It is useful to look at how work areas in a manufacturing facility map onto the MFG/PRO eB concept of departments, work centers, machines, and production lines.

Department for Accounting

Departments: A manufacturing facility is split into departments for control purposes. Each production unit must belong to only one department. This grouping is used primarily for capacity planning and accounting purposes. GL accounts are attached to each department.

Work Center for Production and for Subcontracting

Work Centers: A work center is a specific production unit within a department consisting of one or more people and/or machines. You must have at least one work center in order to set up routings and to report labor.

Subcontracting: If you subcontract work to outside suppliers, set up a subcontract department and work center code for each subcontract supplier. These work centers do not have labor or burden costs—subcontract costs are entered on the routings.

Machines: In a work center with multiple machines, identify each one separately only if they are not completely interchangeable—if work must be scheduled on a particular machine, or if cost or lead time is different on each machine.

When there is more than one machine, you can specify the number of machines that can be used for each operation (parallel production).

Production Line = Work Center

Production Lines: Production lines are set up and used in the Repetitive module for line sequencing and production reporting. Usually, you set up a work center with the same code as the production line because the routing or process references a work center code, not a production line.

Setup Activities



Intro-eB-SU-055

Setup Activities

In this activity you:

- Add a department record
- Add a work center record

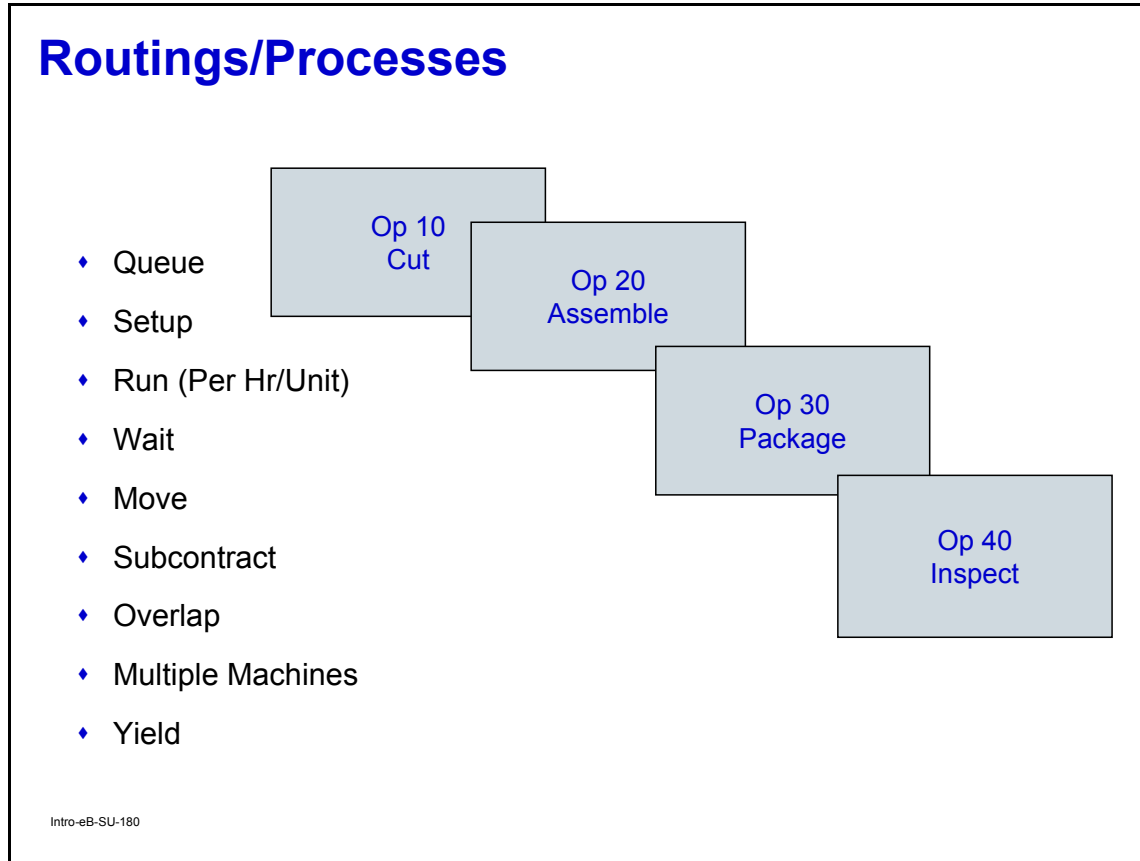
Add a Department Record

- 1 Choose Department Maintenance 14.1 and a new department record.
- 2 Calculate your labor capacity based on the number of machines/people in your sample data (machines times the number of work hours per day).
- 3 Use the default account numbers, and update the record. Where did these account numbers come from?

Add a Work Center Record

Add a work center record using Work Center Maintenance 14.5. Use your sample company data or the following:

Department: The department just created
Machines per op: 1
(# of) Machines: 5
Set up rate: \$10
Labor rate: \$10
Lbr Bdn %: 40%



Routings/Processes

Routing Code

A routing or process defines the set of operations required to manufacture a product. Routings/processes are identified by a unique routing code, usually the item number. Other routing codes can be used to identify alternate routings or generic processes that apply to several items.

Setup and Run or Subcontract

A routing shows the work centers/machines used, the sequence of operations, and the tools and standard hours required. Only the operation number and the work center/machine must be

identified; normally, set-up and run time is also entered. Run time can be specified as the processing time per unit (or batch) or the units per hour. Subcontract operations have no setup or run; they have a standard subcontract time and cost.

Yield

Unfortunately, manufacturing operations do not always result in 100% yield. Expected in-process loss can be specified on each operation. The loss at each operation can be rolled up to calculate expected item yield.

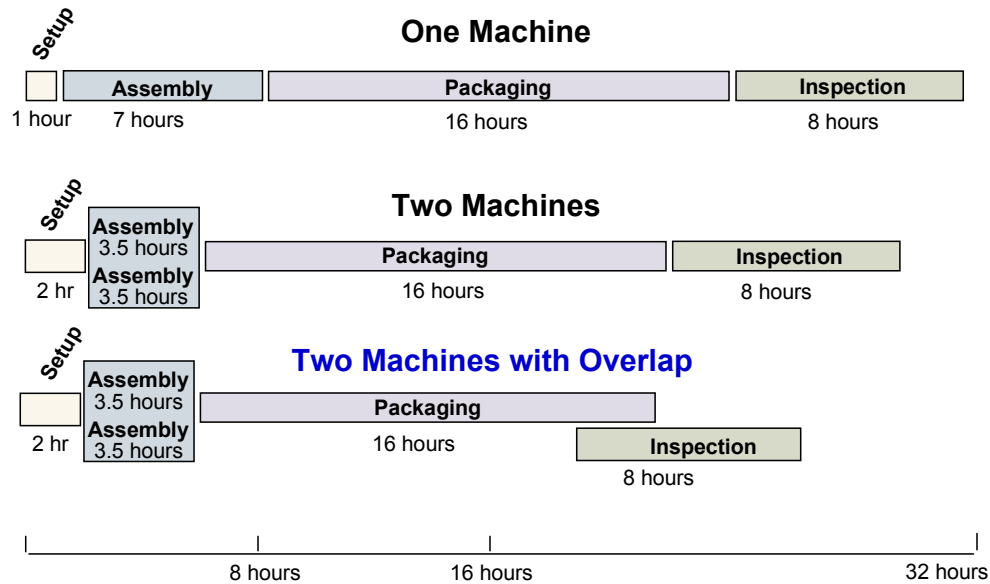
When yield is less than 100%, MRP increases planned order quantities to include anticipated yield loss.

Parallel Processing

Manufacturing operations normally are processed in numerical sequence by operation number. Any one operation can be processed in parallel by specifying multiple machines per operation.

Any two operations can be processed in parallel by specifying an overlap quantity. Overlap quantity indicates the number of units that must be completed at an operation before any units can be moved on to the next operation. In a process environment overlap quantity is usually 1.

Lead Time Calculation



Intro-eB-SU-190

Lead Time Calculation

At every manufacturing site, each item is assigned a standard routing code. This routing is used for planning and costing. Routing Cost Roll-Up 14.13.13 calculates item cost and manufacturing lead time. This is the lead time used by MRP calculations. It is based on:

Queue Time

- The time work normally waits at a work center before the operation begins

Setup Time

- The time required to prepare the work center/machines for processing
- This is independent of batch size

Run Time

- The standard amount of time required to process a single unit of this item
- It can be entered as the units per hour or run time per batch
But internally this is converted to a run time per unit.

Wait Time

- The time spent waiting after the operation is done (drying, curing, cooling)
- This is based on a 24-hour clock, not the shop calendar

Move Time

- The time a work order is in transit from one operation to the next

Subcontract Lead Time

- Number of calendar days it takes to process the standard order quantity through this operation

Yield %

- The normal yield percentage for this operation
The percentage of any order expected to be in usable condition after this operation (used to calculate cost).

Lead Time Days per Order Quantity

Manufacturing lead time is calculated as the sum of the manufacturing lead times from each routing operation. It is expressed as the number of days required to manufacture the standard item order quantity. This calculation considers the hours available at each work center/machine, the number of machines per operation and any operation overlap.

Alternates

13.15 – Alternate Structure Maintenance

Alternate Structure Maintenance

UserMenu Edit Queue Options Help

Item Number: 10-15000

UM: EA

NOMAD(TM) COOLING S

AUTOMOTIVE UNIT

BOM/Formula: 10-15001

Reference:

Remarks:

14.15.1 – Alternate Routing Maintenance

Alternate Routing Maintenance

UserMenu Edit Queue Options Help

Item Number: 10-15000

Site: 10000

Description: NOMAD(TM) COOLING S

Drawing: 10-15000

AUTOMOTIVE UNIT

Item Type: FINGOOD

UM: EA

Status: AC

Routing Code: 10-10000

Bill of Material:

Intro-eB-SU-200

Alternate Structure Maintenance

Menu Number 13.15

Alternate Routing Maintenance

Menu Number 14.15.1

BOM and Routing Codes

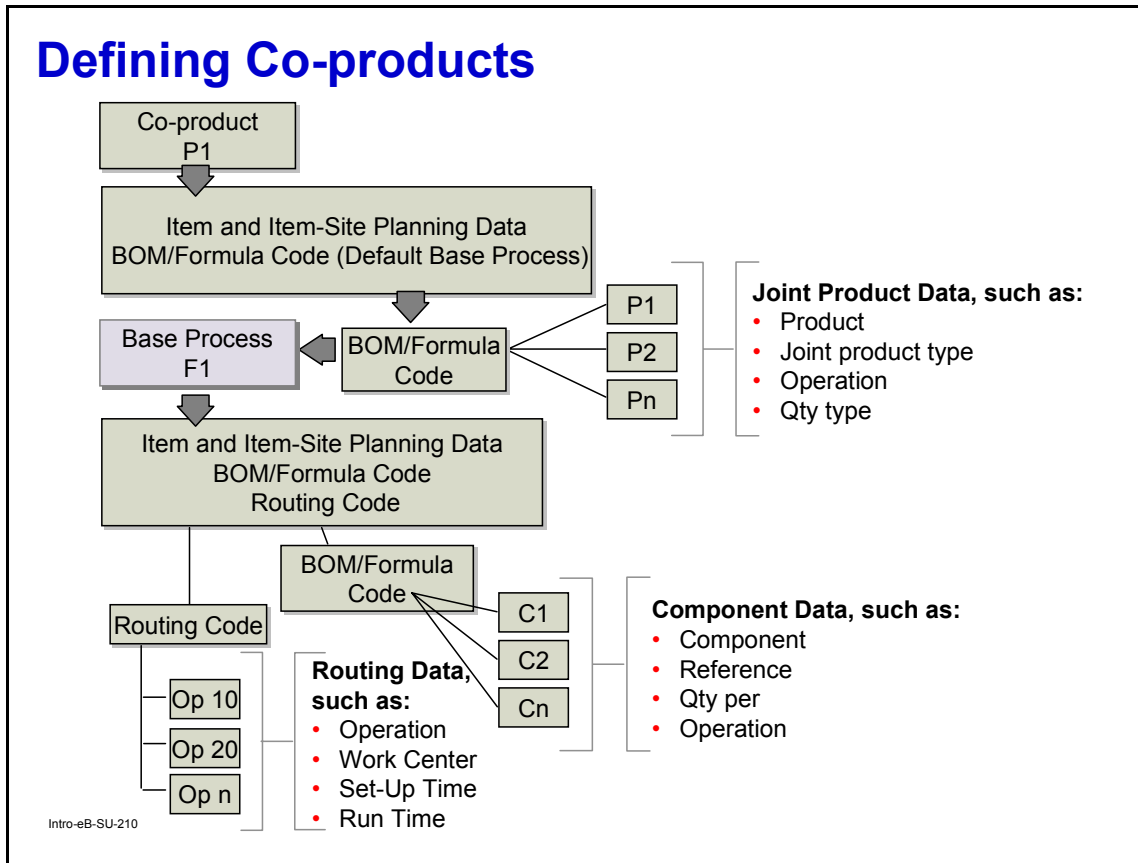
BOM codes and routing codes enable you to record an unlimited number of alternate bills and routings. However, these cannot be used for production until they have been designated as valid alternates for a given item. Only then can you reference these alternates on a work order.

- Alternate structures can be associated directly with an item in Alternate Structure Maintenance 13.15. These apply to all sites.
- Alternate structures, which can be tied to a specific alternate routing in Alternate Routing Maintenance 14.15.1, are site specific. They designate that if this alternate routing is used, it requires the use of the components specified in the attached BOM. Alternate bills cannot be used with this routing.
- Alternate routings do not have to specify a BOM. If they do not, then this alternate routing can be used with the standard bill or any of the valid alternates.

Substitutes

Rather than choose an alternate bill, you can simply substitute one component item for another. This relationship must be predefined using Item Substitution Maintenance 13.19.

Once defined, substitute items can be issued. Substitute items are not planned by MRP, but they can be printed on shortage reports.



Co-products

Co-products manage the situation where a single process produces more than one usable product. A user may need to keep information on co-products (the intended result of a co-products process) or by-product (a waste product with normally little or no value).

For example, in orange processing, the co-products are orange juice and orange extract. The by-products are orange seeds and pulp, neither of which is used for other products.

The base process is central to co-product manufacturing. You define the base process as a regular item; the difference between a regular item and a co-products item is that the co-product structure overlaps the BOM/Formula.

The BOM defines the input to the process; the co-product structure defines the output of the process—co-products, by-products, and their quantities. A base process is defined and the inputs are defined as a regular structure and the outputs are defined as a co-product.

Setup Activities



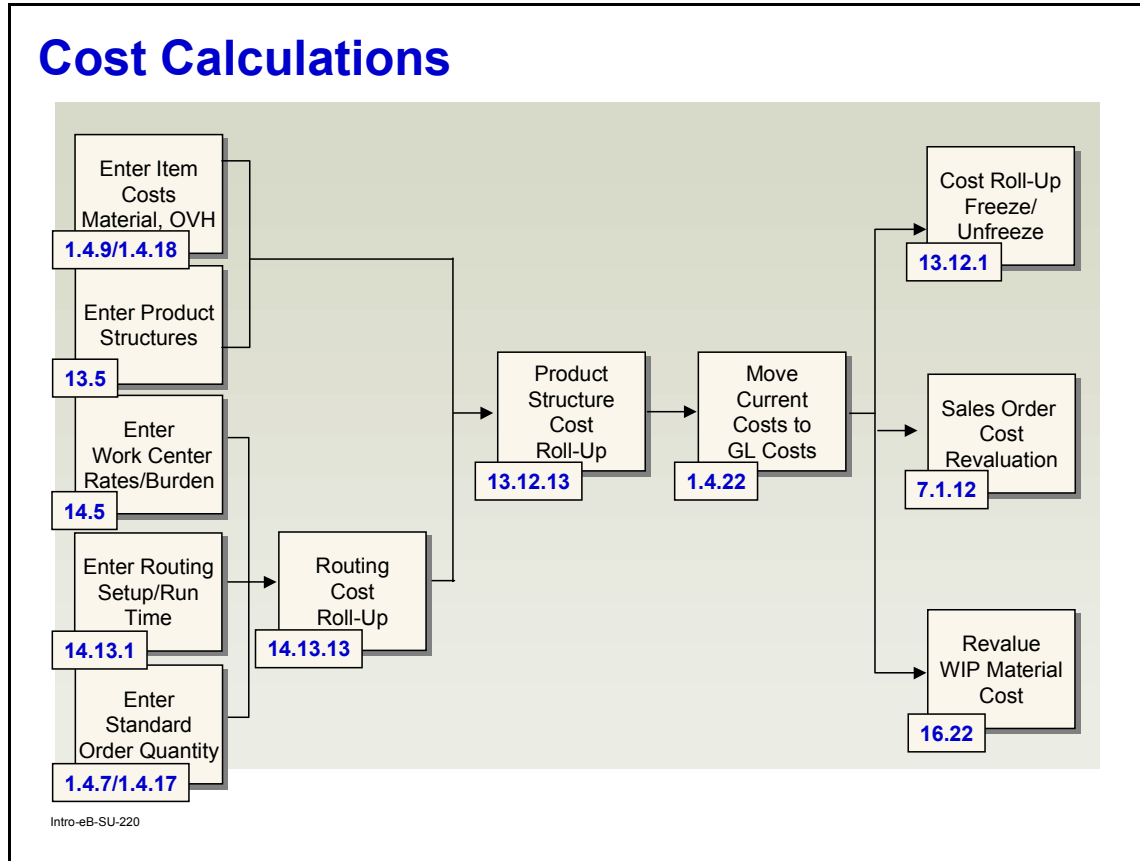
Intro-eB-SU-055

Setup Activities

Define a Routing or Process Definition

- 1 Use Routing Maintenance 14.13.1 to add a routing code that is the same as the manufactured item number.
- 2 Add at least two operations (use sample data, if applicable) to the routing. On the first operation, enter both set-up and run time—how long it takes you to set up for each order and how long you need to run for each unit, respectively.
- 3 Enter the second operation run time. Update the record, and exit.

- 4** Review your routing in Routing Inquiry 14.13.3 and make sure that both operations and the correct set-up and run time display.
- 5** In the Item Planning Maintenance 1.4.7 Order Qty field, add a standard order quantity to your end item. This is the number of units that the cost of set-up time is spread over.



Cost Calculations

Sources of Cost

Product cost calculations use the following information:

- Purchased material, overhead, and other costs are entered manually in Item-Site Cost Maintenance 1.4.18 for purchased items
 - Typically, no material cost is entered for manufactured items
- Component quantity per and scrap rates are entered in the BOM
- Labor and set-up rates are entered for each work center
- Variable burden at each work center expressed as:

- Labor burden rate
 - Labor burden percentage
 - Machine burden rate
- Manufacturing set-up and run times are entered on each routing operation
- Yield at each operation
- Subcontract cost per unit entered on each subcontracted operation
- Item order quantity entered in Item Planning Maintenance 1.4.7
 - Identifies the standard order size for setup cost allocation
- BOM and routing code entered in Item Planning Maintenance
 - Identifies the structures and routings to use for costing purposes.

Costing Process

This-level costs are calculated from the item's routing or process. (Enter purchased items' this-level costs manually.)

Lower-level costs include the costs of the item's components and are calculated by rolling up costs of components listed in the item's product structure or formula.

Total cost is the sum of the this-level and lower-level costs.

Setup Activities



Intro-eB-SU-055

Setup Activities

In this activity you:

- Make sure you have entered the elements needed to do the cost calculation
- Roll up routings to calculate the amount of labor and burden for manufactured items
- Roll up product structure to calculate the amount of
 - Lower-level material
 - Labor
 - Burden
 - Subcontract cost
- Copy the Current cost set to our GL cost set
- Copy the GL cost set from the manufacturing site to the distribution site

Cost Calculation Elements

Review the following to make sure the elements needed for your cost calculation have been entered:

- Check current cost set purchased components material costs (Item Cost Maintenance 1.4.9)
- Check setup, labor, and burden rates for your work center (Work Center Maintenance 14.5)
- Check set-up and run time for your routing operations (Routing Maintenance 14.13.1)
- Check standard order quantity for your item (Item Planning Maintenance 1.4.7)

Calculate Amount of Labor and Burden

- 1** Select Routing Cost Roll Up 14.13.13 to roll up the routing cost. Use this function even if your routing is a process definition.
- 2** Enter your manufacturing site in the Site field and let the system default to the Current Cost Set.
- 3** Use the default settings for all other fields and update.
Note: There is no output for this function.
- 4** In Item Routing Cost Report 14.13.15 or Item-Site Cost Inquiry 1.4.10, check to see if your costs were correctly calculated for labor and burden.

Calculate Lower-level Material, Labor, Burden, and Subcontract Cost

- 1** Select Product Structure Cost Roll-Up 13.12.13 to roll up the product structure.
- 2** Use your manufacturing site and roll up your current cost set. Leave the item numbers blank and enter your product line in the product line range selection criteria. Run the update.

Copy the Current Cost Set to the GL Cost Set

- 1** Check the current cost set costs in the Product Structure Cost Report 13.12.4 or Item-Site Cost Inquiry 1.4.10.
You should have lower-level material costs, this-level labor, and burden costs for your end item.
- 2** If you are satisfied, use Current Cost Set Move to GL Set 1.4.22 to copy the data from your Current cost set to your GL (standard) cost set.

- 3 Enter the site to copy.
- 4 Accept the default values for the remaining fields.
- 5 If it is necessary to repeat the Current Cost Set Move to GL Cost Set, modify the value in the Pct Change Allowed fields.

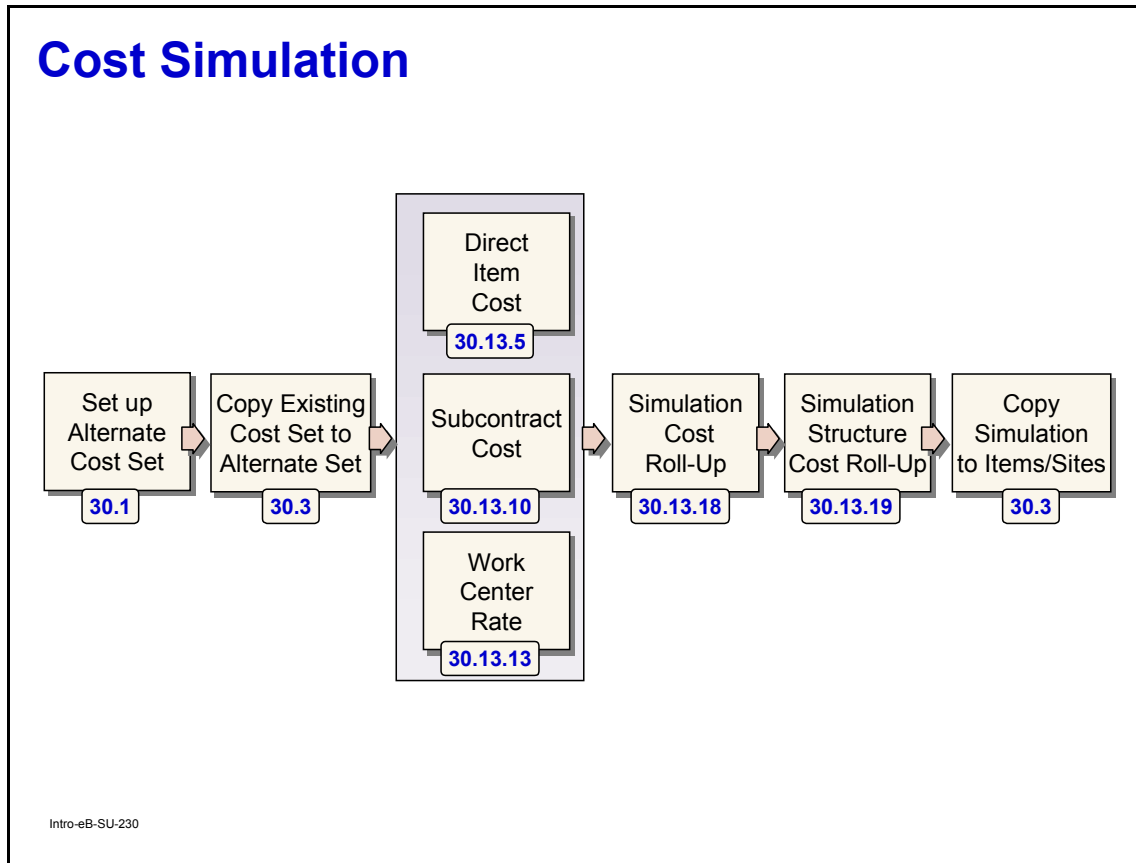
These fields set upper and lower limits for the percent of change between cost sets. When the target cost set has a zero cost, the change is not limited to a percentage, but once a cost set has been recorded, the Pct Change Allowed fields limit the change allowed.

Checkpoint

Do you have GL costs for all the items at your manufacturing site? Do you have GL costs for your end item at your distribution site? Use Item-Site Cost Inquiry 1.4.10 to verify.

Copy the GL Cost Set from Manufacturing Site to Distribution Site

- 1 Select Cost Set Copy to Cost Set 30.3 to copy the GL cost set at the manufacturing site to the GL cost set at the distribution site.
- 2 Enter the manufacturing site and cost set Standard as the site and cost set to copy from and the distribution site and cost set Standard as the site and cost set to copy to.
- 3 Accept the default values for the remaining fields.



Cost Simulation

Multiple Cost Sets

The Cost Management module maintains an unlimited number of costs for an item in addition to current and GL costs. Cost simulation functions develop or store such things as historical, projected future, budgeted, and “What if?” costs.

Cost Set Type SIM

Cost simulation sets can be entered manually, copied from other simulations, or copied from existing manufacturing information. Each cost simulation set is identified by a cost set code. Its cost set type must be SIM.

Development Cycle

To develop a simulation, first set up the cost set code and beginning costs, usually by copying an existing set of costs 30.3. This creates cost elements and copies the costs you specify.

If you set up a new cost set manually, you will have to define the cost elements and enter the direct item costs, work center rates, and subcontract costs. Then these costs and rates can be adjusted either manually or through mass update functions.

Roll-Up

Once the costs have been set up, roll-up functions calculate the simulated item costs. As in standard cost development, manufacturing costs are rolled up and then product structure costs.

The roll-up process uses the BOM and routing specified for each item in Item-Site Planning Maintenance 1.4.17.

Simulated costs can be used to update current or GL item costs, work center rates, and subcontract costs.

Cost Planning

30.15.2 – Cost Plan by Site Browse

22.19 – Master Schedule Summary Report

Intro-eB-SU-240

Cost Planning

When you know that costs are going to change temporarily or permanently, you can record that information in the Cost Planning function.

Cost plans are accessed in just two places:

Costed MRP

- MRP Summary Report 23.14 to produce costed material planning reports

Costed Master Schedule

- Master Schedule Summary Report 22.19 to produce costed master schedule reports

Usually each of these reports shows the future cost of production based on only today's GL cost.

However, if you have recorded anticipated future costs in the system and indicate the date you expect them to become effective, costed MRP and Master Schedule reports can project future costs more accurately.

If costs are expected to rise, the scheduler can take this projected increase into consideration and reschedule orders to minimize costs.

Hyperinflationary Economies

Cost planning is particularly useful in hyperinflationary economies, where costs rise by a factor each week or month.

These costs are not automatically used for GL purposes on the date specified. You have to run a batch update function to update costs and revalue inventory.

Answers to Questions
on page 95

- There must be at least one DB per financial reporting currency
 - Other than that, a number of answers are correct
- This exercise is simply to get discussion going, not to end up with a right or wrong answer
- All the U.S. plants can be on the same DB, but what about physical distance?
- Also, you may want to have a consolidation DB for the U.S. and another for HQ



Course Overview

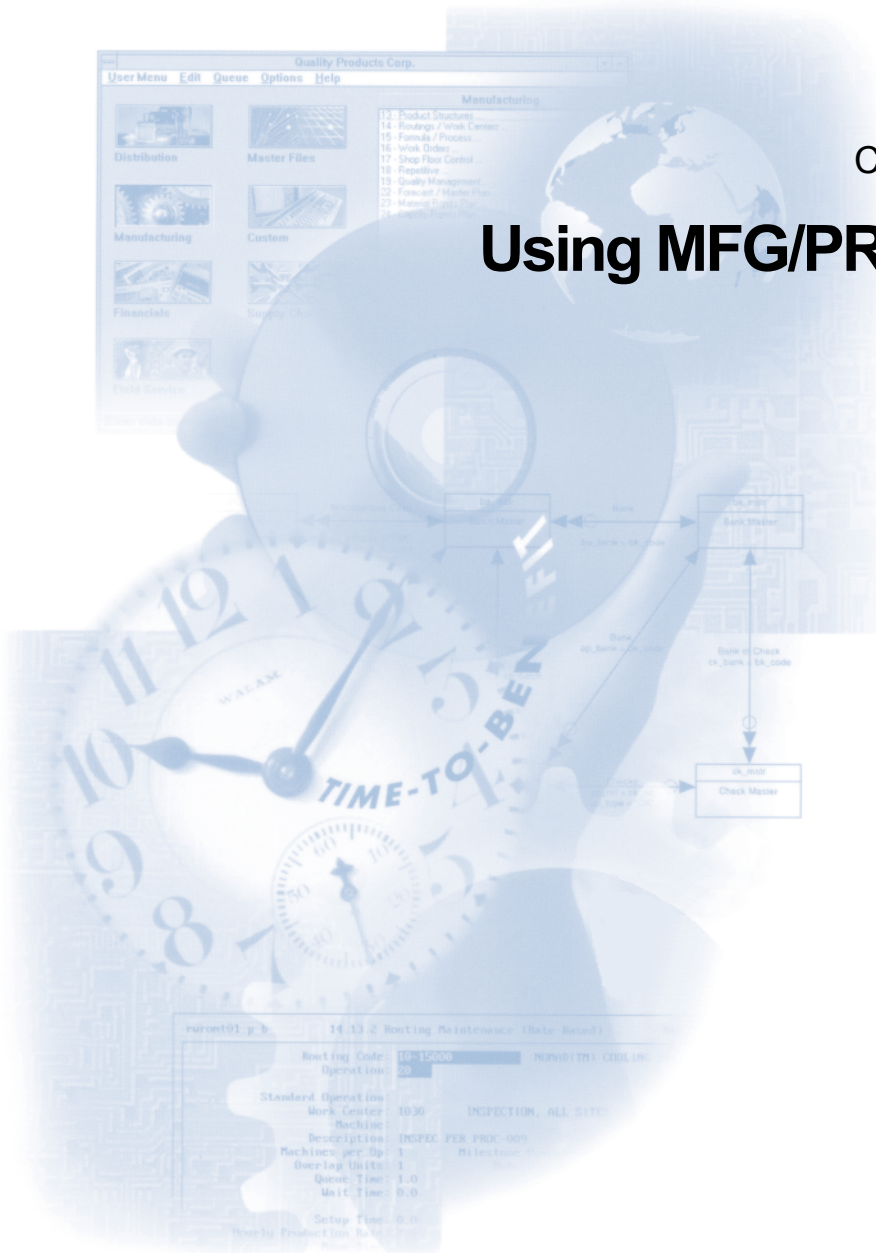
- ✓ Introduction
- ✓ MFG/PRO Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ◆ Use MFG/PRO eB
- ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-SU-250

What's Next?

In the next chapter of this training guide, we will begin using MFG/PRO eB to process business functions.

Using MFG/PRO eB





Using MFG/PRO eB

In this section you learn how to:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ **Use MFG/PRO eB**
 - ✓ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-Use-010

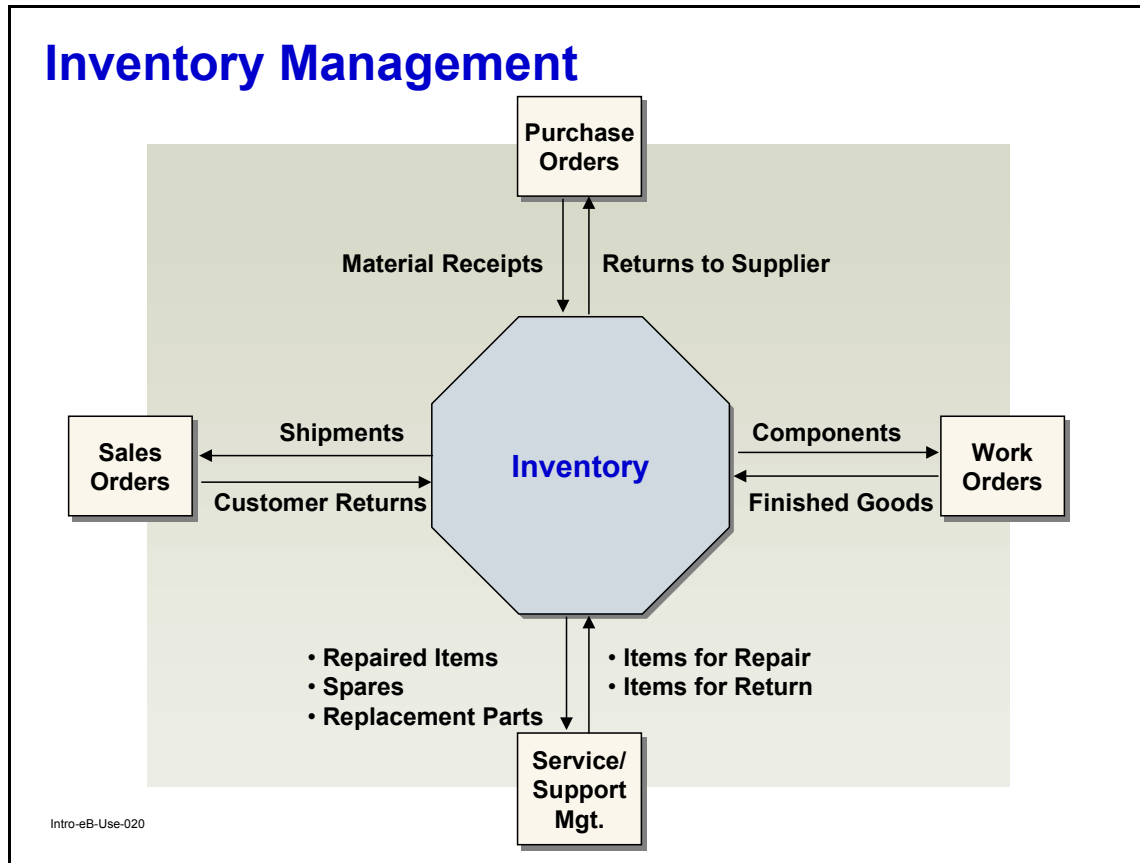
Using MFG/PRO eB

During an implementation, after you have set up the basic infrastructure and product definitions, you can implement other modules in any order that works for your company.

We are going to start with inventory because inventory is central to all processing functionality.

After we see how inventory is tracked and managed, we will review the systems that affect inventory, starting with Purchasing. Purchasing is the primary means for receiving material into your inventory.

Then we will look at work orders, where component inventory is used to manufacture an end item. Next, we look at how end items are returned to inventory to be sold and shipped using sales orders.



Inventory Management

Each of the execution functions—Sales Orders, Purchasing, Manufacturing, and Service and Support Management—affect inventory. Before we look at these functions individually, we need to understand how they work together.

Inventory is a balance sheet asset. Unlike cash, it can be used only to make products or be sold, so it is important to carefully manage the amount you have: too much or too little is a problem. You want to have plenty of inventory on hand to meet customer sales demand, but you do not want to have too much cash tied up in inventory. Not only is there an opportunity cost in having inventory instead of cash, you also risk having obsolete, unneeded inventory.

To properly manage your inventory, at any given time you need to know:

- How much inventory do I have on hand?

- Where is my inventory located?
- Is it usable? (Has it expired, is it already allocated to another order?)
- Is the computer balance accurate?
- Where have I used my inventory and where did it come from?

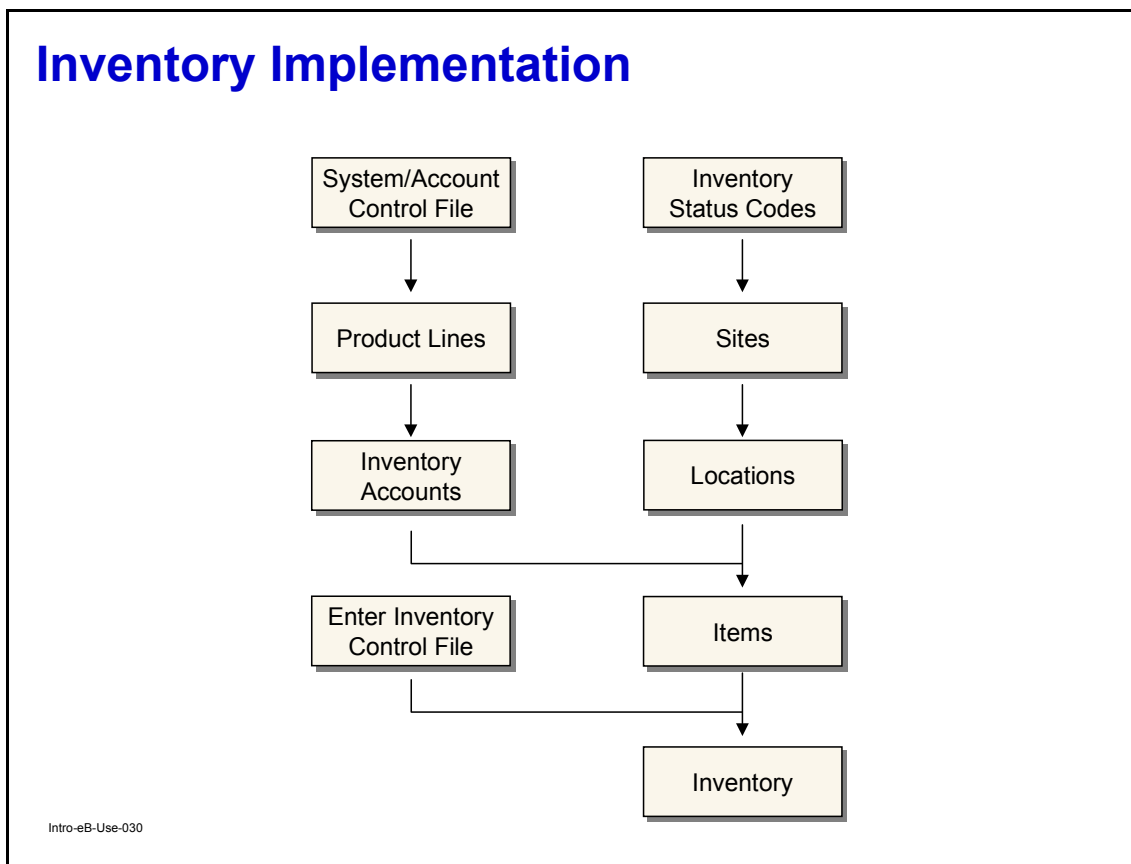
To track inventory in detail, each transaction that occurs in other MFG/PRO eB modules must be tracked.

For a sales transaction, when materials are shipped or a customer returns items, the system must change the inventory balance and create an inventory transaction to document the shipment.

Simultaneously, a GL transaction must be created to update the inventory accounts and the COGS (cost of goods sold) accounts.

Similarly, when an item is purchased for or returned to your company, the inventory balance and the account balances must be updated. In manufacturing, component inventory is decreased when issued to work orders, and when they are complete finished goods inventory is increased.

In Service and Support Management, spare parts are sent to customers, items are returned for repair, and components are issued to work orders, all affecting the inventory balances.



Site-location Details

Inventory balances are maintained by site, and all planning is done by site. Within each site, individual inventory items are stored in locations.

Details are maintained for each lot/serial and lot reference number including grade, assay %, expire date, and inventory status. Inventory status determines how this inventory balance is used. Each site and location is assigned a default inventory status.

Steps

There are several steps involved in setting up inventory as shown in the illustration shown above. The steps on the right side involve the physical aspects of inventory—where it is stored and how.

Inventory implementation requires the definition of inventory status codes, sites, locations, and items. Item information may be different at different sites.

Monetary Aspects

The steps on the left side involve the monetary aspects of inventory—which GL accounts are used to record inventory and its movement. The System/Account Control File 36.1 is normally the starting point since it establishes a whole group of default inventory accounts. These are accessed when you set up product lines and can be changed for each product line. Inventory accounts can also be established by product line and site in order to track inventory value separately.

1.1.1 – Inventory Status Code Maintenance

Restricted Transactions		
Restricted Transaction	CIM Allowed	Description
ISS-SO	no	Sales Order Shipments
ISS-WO	no	WO Issue or Backflush

Intro-eB-Use-040

Inventory Status Codes

Inventory Status Code Maintenance

Menu Number 1.1.1

Inventory status codes control your inventory and manage how that inventory is used. Think about your facility—scrap is certainly managed differently than finished goods inventory or spares. In MFG/PRO eB, these different types of inventory are identified by their status codes.

Generic Codes

Generic inventory status codes are set up for each type of inventory you have. These identify whether inventory balances of this type are:

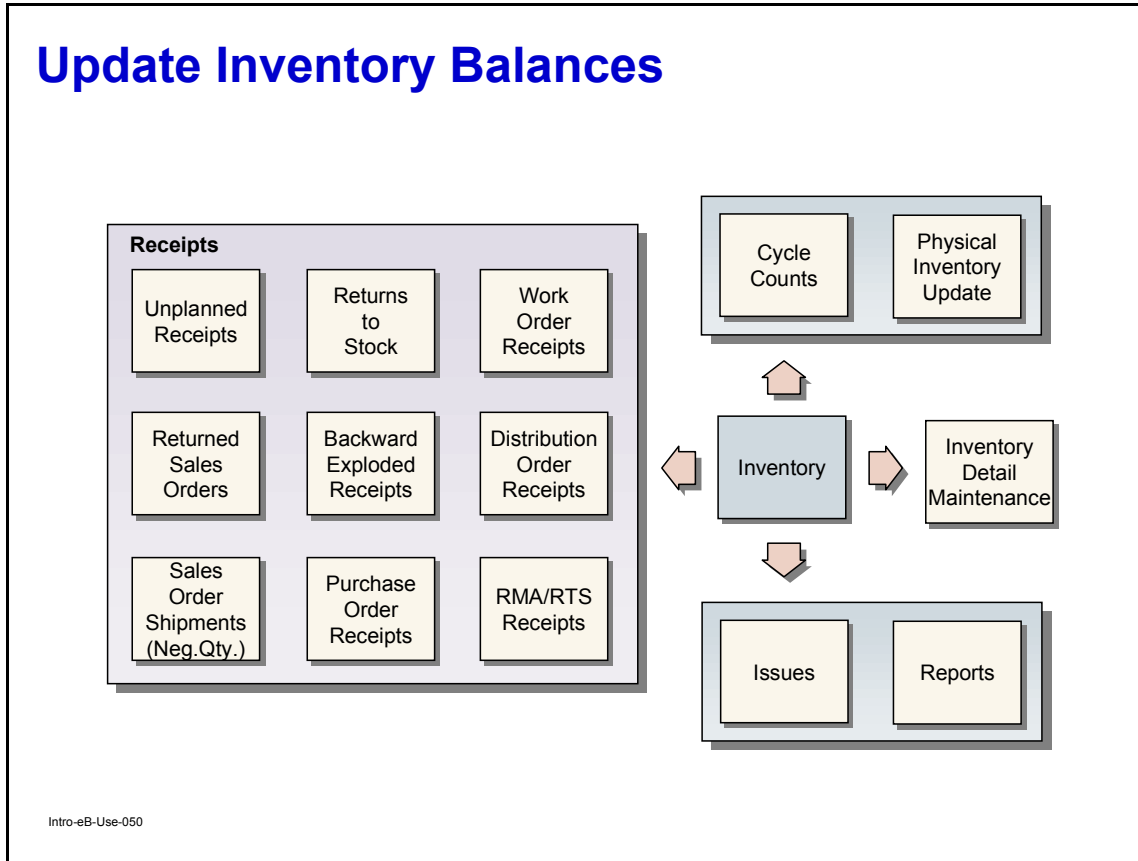
- Available to allocate to sales orders and manufacturing orders
- Nettable to be considered by MRP when calculating net quantity on hand
- Overissue to denote if this inventory balance may be negative

Restricted Transactions

In addition, certain transactions can be restricted. Each inventory status code can have a list of restricted transactions attached. For example, access to sales order issues can be restricted from a QC Hold location.

All Transactions Check Status

Whenever items are received into inventory, a status code is associated with that inventory. This defaults to the status code entered for the location but can be changed using Inventory Detail Maintenance 3.1.1. Whenever you attempt to do something with this inventory—allocate it, issue it, move it—the system checks its status code and makes sure that this is a valid action.



Update Inventory Balances

In addition to the individual inventory details—item, site, location, lot/serial, lot reference, and quantity—the system also maintains summarized inventory amounts in the inventory master file.

This file records the total quantity on hand, on order, allocated, available, and non-nettable for every item and site. It also keeps track of average sales and average usage for each item and site. These averages can be used to calculate ABC classes for your items.

Receipts–Unplanned

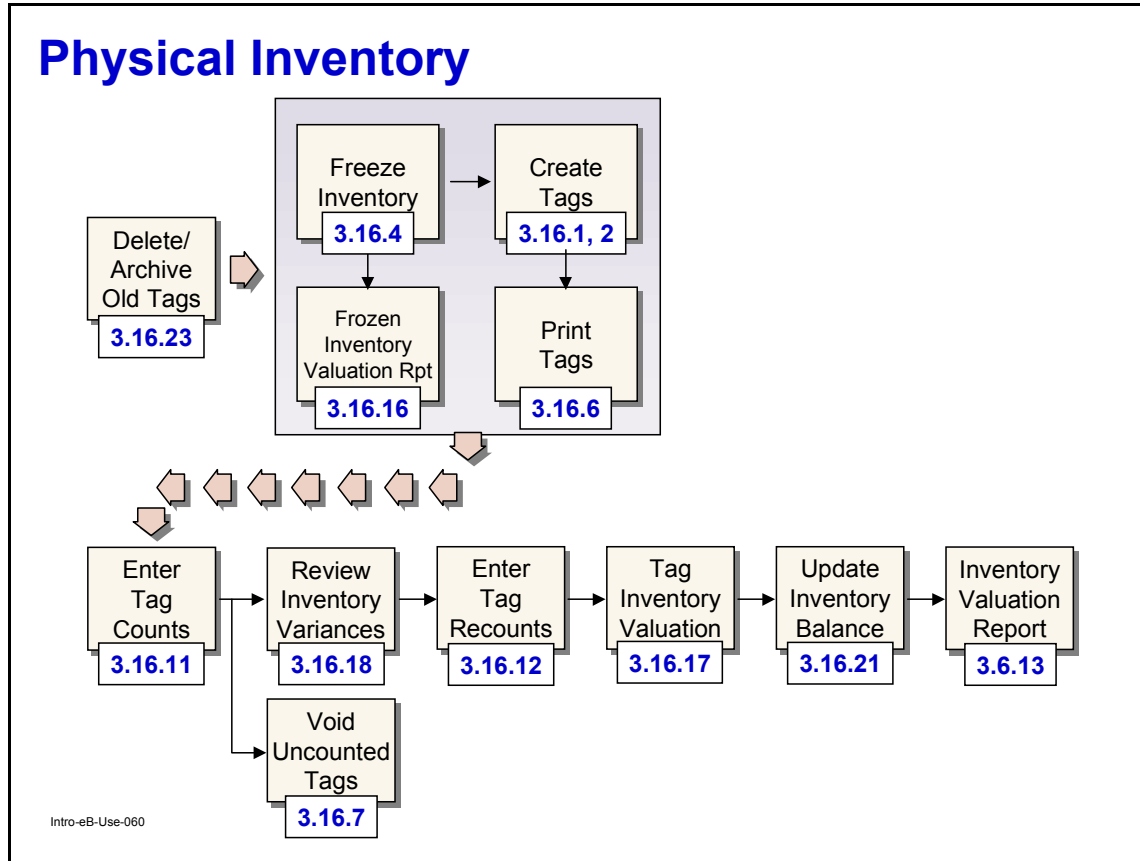
During implementation, inventory balances initially are loaded into the system using the Receipts - Unplanned 3.9 transaction. This updates quantity on hand and creates inventory details without affecting average sales or average usage.

Note There are inventory transactions available on the Inventory Control Menu, but normally these are not used once other modules have been installed. They are meant for processing only truly unplanned activities.

Other Transactions

Transactions from other modules that update inventory include:

Receipts	Issues
Sales Order Shipment (negative)	Sales Order Shipments
Purchase Order Receipts	Purchase Order Returns
RMA and RTS Receipts	RTS Issues
Distribution Order Receipts	Distribution Order Shipments
Work Order Receipts	Work Order Component Issue (backflush)
Repetitive Labor Feedback (last op.)	Repetitive Labor Feedback (backflush)
Quality Order Receipts	Quality Order Maintenance (issue materials)



Physical Inventory

The accuracy of your inventory is important because it is a key input to your planning and order promising and because it represents a balance sheet asset. The accuracy of inventory becomes a question when proper control procedures are not in place to prevent data entry and fulfillment mistakes. Physically counting helps to restore accuracy.

MFG/PRO eB supports cycle counting and physical inventory count procedures by site, location, item, and lot/serial number that can be used to update actual inventory balances. Only inventory can be counted. WIP can be audited using the Work Order Status Report 16.3.3.

Physical Inventory Process

Freeze and Print Tags

Inventory balances are frozen prior to entering physical inventory counts. Count tags are created for each inventory item site, location, and lot/serial number. Additional bulk tags can also be created for recording items you find during the course of a physical inventory (for example, items hidden in drawers).

Count and Update

When physical counts are performed and entered, all counts, even if they do not match the frozen quantity, are accepted. Errors can be reviewed and recounts entered. Enter all quantities, taking into consideration any activity made since the freeze. (Although it is better to suspend operations during a physical inventory, MFG/PRO eB does not require it.) Once all tags have been accounted for, use Inventory Balance Update 3.16.21 to update actual inventory balances.

Cycle Count Process

In cycle counts, a number of items are usually selected randomly for counting each day. Cycle counting is a two-step process. An initial count is entered and, if it matches the system quantity or lies within a predefined tolerance, the system quantity is updated. If it is out of tolerance, the count is rejected. Recounts then set the system quantity to the quantity counted regardless of the error tolerance. Error tolerances are defined in the Inventory Control File 3.24.

3.21.1 –Transactions Detail Inquiry

Report - Transactions Detail Inquiry	
File Edit Search	
Trans: 2134	Order: S9710001
Trans Type: ORD-SO	Revision: 0
Date: 01/06/97	Item Number: 02-0020
Time: 23:19	Description: LEAD REFILL PACK
Effective: 01/06/97	UM: EA
Remarks:	Address: 1001000
User ID: tmt	Name: CENTURY HALLMARK
Program: sosomt.p	Sales/Job: S9710001
Currency: USD	Ship Type:
Qty Change: 0.0	Price: 0.6375
Shipper Number:	Inv Mov:
Ship Date:	
Inventory Data	
Site: train	Begin Balance: 19,850.0
Loc:	Qty Change: 0.0
Lot/Serial:	Qty Short: 0.0
Inv Status:	Begin Loc Bal: 0.0
Supplier Lot:	Loc Qty Change: 0.0
Grade/Assay:	Expire Date:
Ref:	Batch:
Cost Data	
Material: 0.20	Overhead: 0.00
Labor: 0.00	Subcontract: 0.00
Burden: 0.00	Cost Total: 0.20

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy Ctrl-V=Paste

Intro-eB-Use-070

Transactions Detail Inquiry

Menu Number 3.21.1

Complete on-line history is maintained for every transaction affecting inventory. This includes any issues, receipts, transfers, changes to inventory cost or characteristics, cycle counts, and physical inventory updates.

In addition, sales order and purchase order changes (bookings) are recorded in this transaction file.

Transaction Number and Type

Each transaction history record is identified by a sequentially assigned transaction number and a transaction type code (ISS-SO, RCT-PO, RCT-TR, CYC-CNT, and so forth).

There are three main categories of information maintained in transaction history:

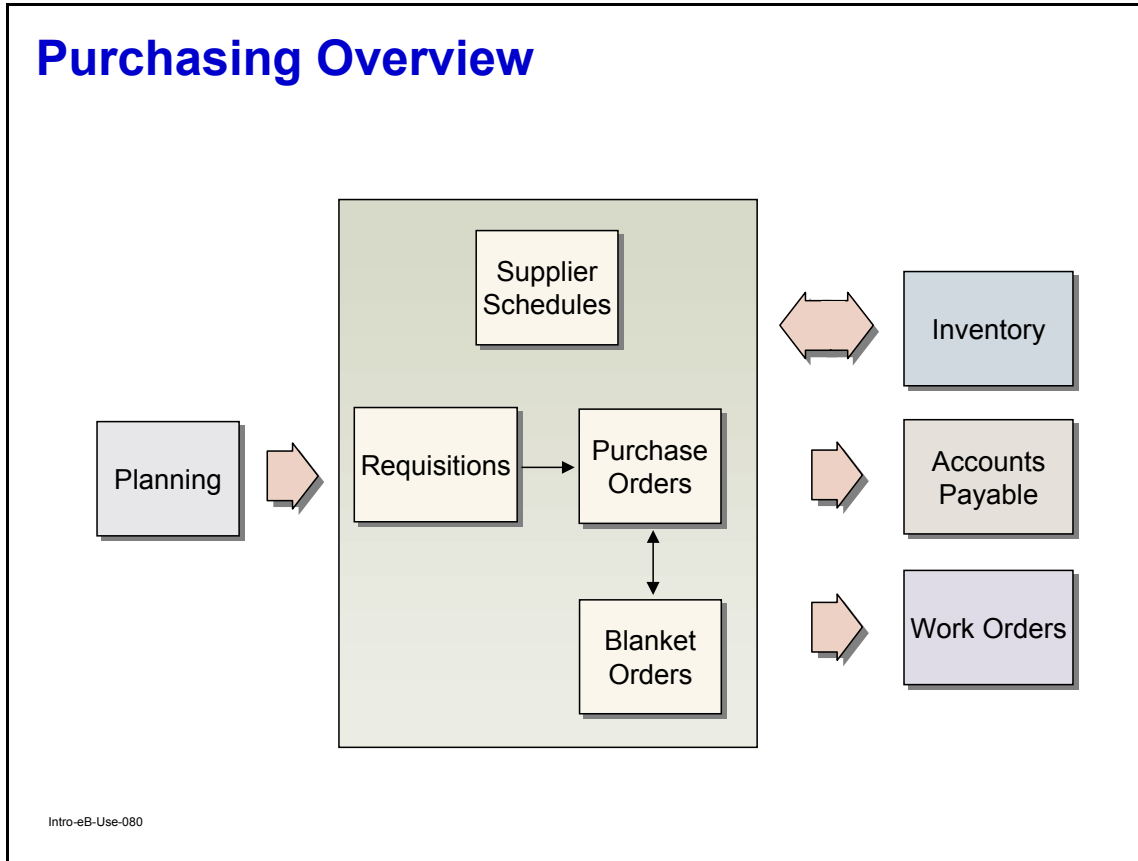
- 1** Transaction information:
User ID, date, time, program, order number, sales/job, address, cost, price, and currency
- 2** Inventory information:
Item, site, location, lot/serial, lot reference, grade, assay, status, expire, and quantity change
- 3** Accounting information:
GL transaction reference, effective date, debit and credit account, and amount

Lot Traceability

Transaction history is used to provide complete lot/serial number traceability. Both the Lot Actual Bill and Lot Where-Used reports are derived from the transaction history file.

Delete/Archive

Transaction history remains on the system until you choose to archive and delete it. Different types of transactions can be deleted at different times—you can purge sales order bookings annually, while shipping history might be maintained for much longer.



Purchasing

Manufacturing activities generate requirements for raw materials, subassemblies, and subcontracted operations. Purchases can be processed differently depending on item type and relationship with the supplier.

Supplier Schedules

For high-volume, repetitive purchasing, MRP generates a schedule of requirements to be forwarded electronically to suppliers. Requirements are shown as a quantity per item per due date, with multiple due dates and quantities for items.

Requisitions

Requisitions tell purchasing to buy items in certain quantities by a certain date. They may be entered for both non-inventory and MRP-generated inventory items.

Purchase Orders

A formal agreement with a supplier to purchase a specific quantity of items to be delivered at a specific time for a specific price. A purchase order (PO) may reference a requisition, which is deleted once it has been fully satisfied.

Blanket Orders

Blanket orders are long-term agreements with suppliers to purchase a certain amount of material over a certain amount of time at a given price. When a need arises, a release is made against the blanket orders to generate purchase orders.

2.9 – Address List Type Maintenance

Address List Type Maintenance

User Menu Edit Queue Options Help

Address: 01000000
 Name: Colossal Conglomerates LTD
 Sort Name: Colossal Conglomerates LTD
 City: Evanston State: IL

Address List Types

customer
 enduser

List Type:

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Use-090

Address List Type Maintenance

Menu Number 2.9

All names and addresses are stored in one file, the address file. Each address on file is uniquely identified by an 8-character address code. A salesperson who is also a customer or a supplier needs his name and address set up only once. A special field called List Type identifies which is which.

List Type

List types can also be assigned manually. For example, if you sell to more than one division of a large company, you could keep track of each division by assigning each one the same list type.

List type codes can be set to any value and each address can be assigned to any number of list types. Sales reports and agings can be selected by list type.

Note Other systems may use the same number ranges for customers and suppliers. When implementing MFG/PRO eB, you may need to develop a new coding scheme. The best is one that takes advantage of the fact that information can be shared and that most reports can be selected for a specified range of address codes.

2.3.1 – Supplier Maintenance

Supplier Maintenance

User Menu Edit Queue Options Help

Supplier Address

Supplier: 5009000 Temporary: no

Name: CALIFORNIA UTILITIES

Address: PO BOX 900

Address:

Address:

City: LOS ANGELES State: CA Post: 91054 Format: 0

Country: United States of America USA County:

Attention:

Telephone: 213-455-8500 Ext: 150 [2]: Ext:

Fax/Telex: 213-455-8501 [2]: Added: 09/05/91

Supplier Data

Sort Name: CALIFORNIA UTILITIES

Type:

Pur Acct: 8400 1000

AP Account: 2100

Ship Via:

Remarks:

F1=Help F2=Go ESC=End F5=Delete Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Use-100

Supplier Maintenance

Menu Number 2.3.1

Address and Remit-To

Prior to using purchasing functions, you need to set up information for each of your suppliers. Supplier Maintenance is used to record the address to which all purchase orders are sent.

If payments are sent to a different address, use Supplier Remit-To Maintenance 2.3.13 to specify the address receiving payments for this supplier. You can define only one Remit-To address for each supplier.

Price Lists

Each of the items you purchase from a supplier can be recorded in Supplier-Item Maintenance 1.19. Each supplier may supply multiple items, even different versions of the same item.

The supplier's internal item number or catalog number can be cross-referenced to your item numbers. The supplier's quoted cost and lead time is entered for each item.

Price lists are used to record quantity discounts. Price lists are accessed during order entry to determine the appropriate PO unit cost.

Printed Documents

Although not required, supplier-item information is quite useful to purchasing. Printed purchase requisitions can list each of the suppliers for an item with their quoted cost and lead time. The supplier item number can be entered directly on the PO; the system automatically retrieves your item number and the quoted cost.

If the PO unit cost you enter is different than the last quoted price, you can update the quote directly from the PO.

Both the supplier's item number and yours print on all documents.

Unit of Measure

Unit of measure conversions can be set up to allow a purchase order line for a unit of measure to be different than the item master unit of measure.

When the item is received, it is converted to the item master unit of measure.

Processing Activities



Intro-eB-Use-105

Processing Activities

In this activity you set up:

- A supplier and a customer address
- Credit terms
- Unit of measure conversions
- Supplier items
- Customer items

Supplier and Customer Addresses

- 1 Use Supplier Maintenance 2.3.1 to record the address for a supplier. Let the supplier code default from the control file. Update and exit. (Press your Escape key to exit the bank accounts frame.)
- 2 Use Customer Maintenance 2.1.1 to record the address for a customer by assigning the customer code to that customer, assigning your distribution site to the customer, and assigning your customer a credit limit. Update and exit.

Credit Terms

- 1 Use Credit Terms Maintenance 2.19.1 to set up credit terms due in 30 days after the invoice

Terms code: Net30

Due Day: 30

Disc Dating From: Invoice date

- 2 Update and exit.
- 3 In Supplier Maintenance and Customer Maintenance, add these credit terms to each of the records you created.

Unit of Measure Conversion

The following is an example of how to use Unit of Measure Maintenance 1.13 to record a unit of measure conversion:

Use Unit of Measure Maintenance 1.13 to record the unit of measure conversion, as shown in the following example:

Unit of measure: EA

Alternate UM: CS

Item number: 02-0005

UM Conversion: 100

- 1 Review your items, and select one that you purchase in a unit of measure different than the item unit of measure. For example, you stock and issue the items as EA, but purchase the items in CS; there are 100 “each” units to a case.
- 2 Record a unit of measure conversion for the item you selected in step one. Make your conversion item specific.

Supplier Items

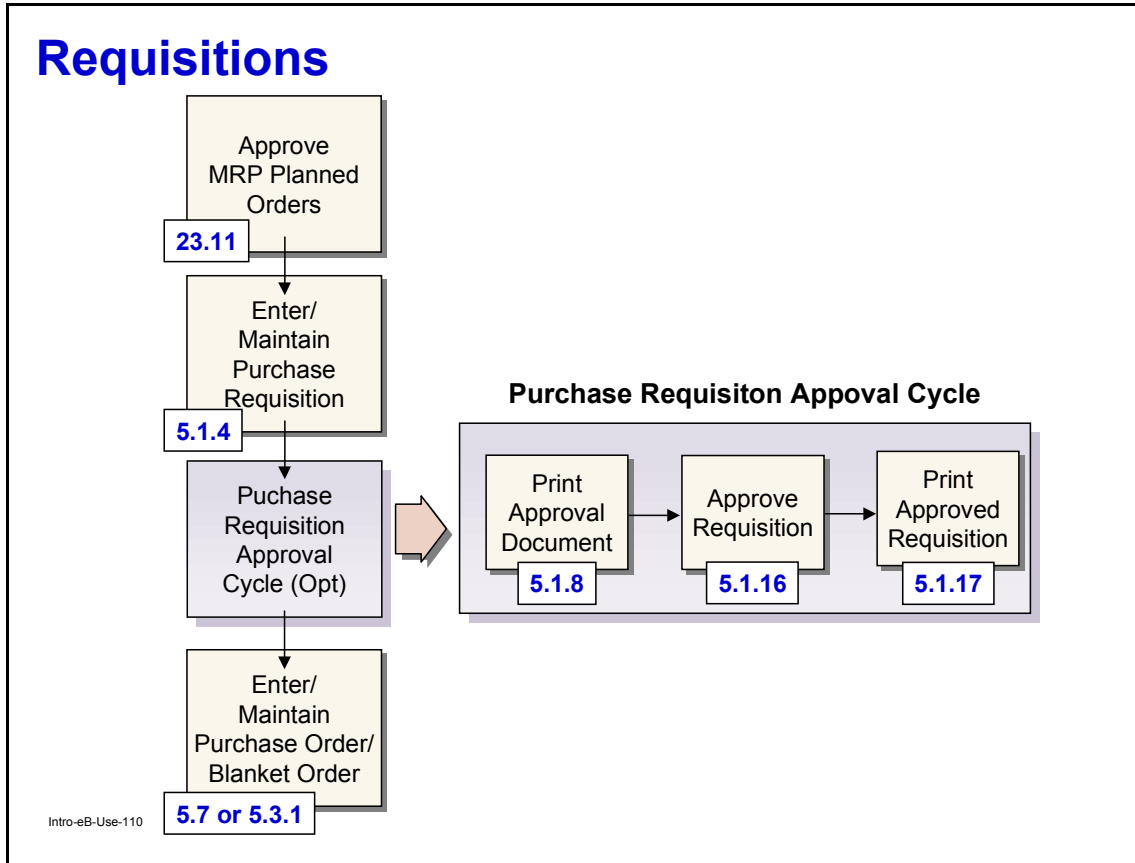
Supplier items are used to cross-reference your item number with your supplier’s item number. You can also document the supplier’s quoted price for the item.

Later, in Purchasing, you can reference the supplier’s item number instead of your own, and the system will find your item number for you.

- 1 Use Supplier Item Maintenance 1.19 to create a record that cross-references your item number to your supplier’s item number. Use the item that has a unit of measure conversion.
- 2 For the unit of measure, enter the purchasing unit of measure, not the stocking unit of measure.
- 3 Enter the quote price for the purchasing unit of measure.
- 4 Update and exit the record.

Customer Items

- 1 Use Customer Item Maintenance 1.16 to define at least one customer item.
You can create a generic cross-reference by leaving out the customer code. This is useful in situations where you have a catalog number and a stocking item number. However, when the supplier item was created above, the supplier code was necessary. You could not create a generic cross-reference.



Requisitions

Requisitions are not mandatory. Purchase orders or blanket orders can be entered directly. When used, requisitions can be generated from MRP or entered manually. You can use requisitions for inventory or non-inventory items.

Approval Codes and Levels

Companies using requisitions may choose to go through a requisition approval process. Approval levels can be defined to establish approval requirements by product line, site, requested by, and purchase expense account.

Then, whenever a requisition is created, it is automatically assigned an approval code. This determines the approval level based on the requisition cost. The approval level indicates the person who must sign off on the requisition before the item can be purchased.

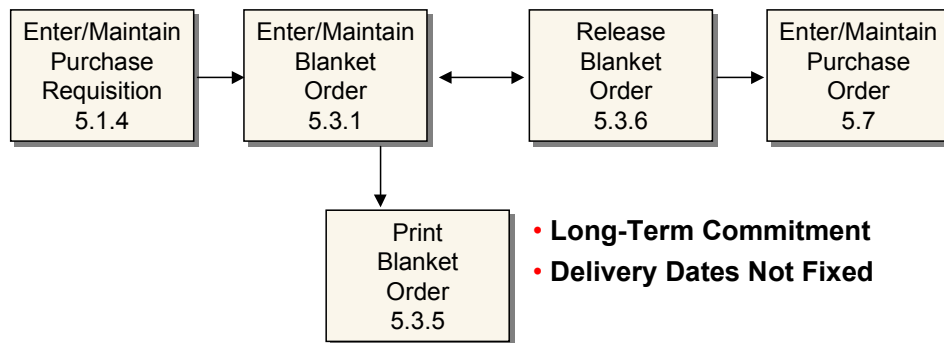
Multiple approval levels can be recorded on each requisition. For example, a \$50,000 purchase may need regional manager approval, but the purchasing manager and division manager must sign off first before it is sent to the regional manager.

Printed Requisitions

Requisition documents can be printed for each item, listing the approved requisitions for that item with the quantity and due date.

Supplier-item quotes can be printed on the requisition document. These are similar to manual “buy cards” (used in many purchasing departments) because they list the supplier options.

Blanket Purchase Orders



Intro-eB-Use-120

Blanket Purchase Orders

Long-term

Long-term purchase commitments are often negotiated with a supplier to supply items used on a regular basis. By committing to purchase a minimum quantity over a period of time, the supplier may offer a lower price or more favorable terms.

No Delivery Dates or MRP

Unlike purchase orders or supplier schedules, blanket orders are not necessarily associated with any scheduled delivery dates. In addition, they are not considered by MRP nor are they included in

the Purchase Order Commitment Report 5.9.4. For this reason, you may choose to use supplier schedules for regularly used items.

Blanket orders are most appropriate when requirements are intermittent.

Release

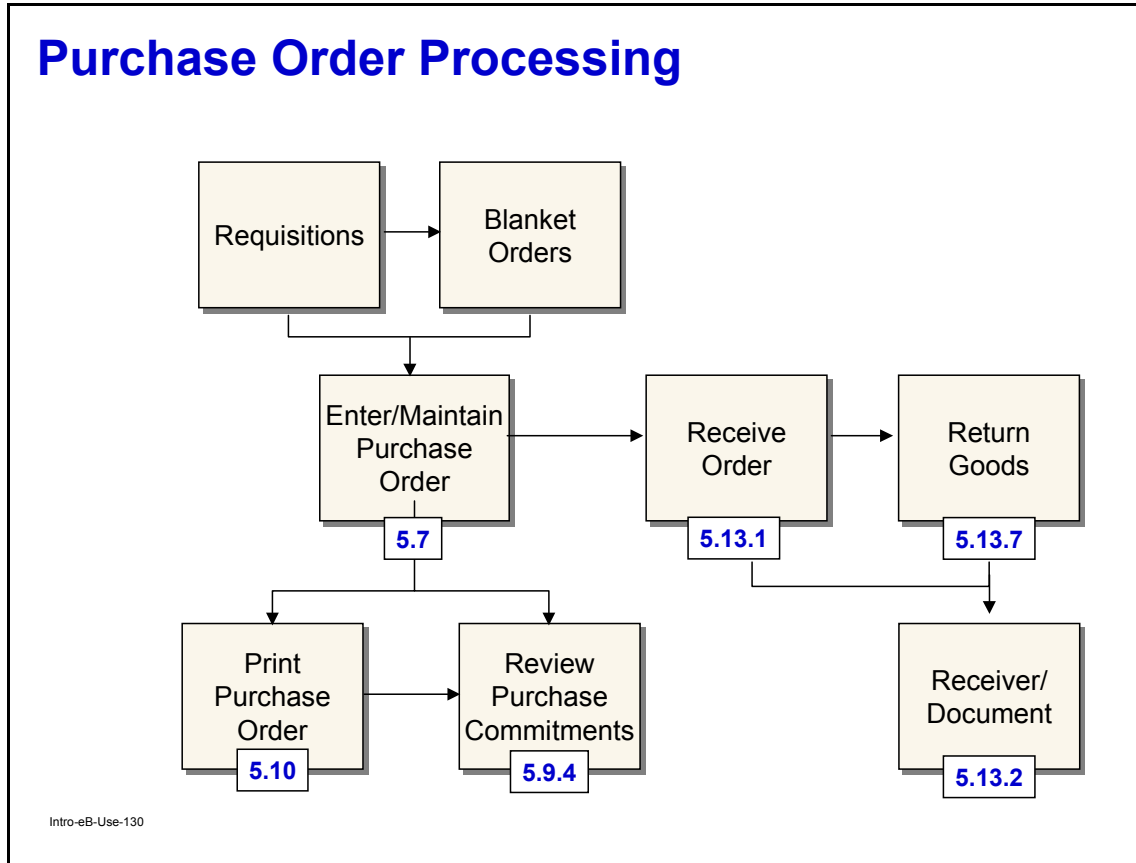
First, the blanket order is entered, printed, and approved. Then, as the supplies are needed, releases are made against the blanket order. Each release specifies a quantity and a due date, and generates a purchase order for that amount. The PO number is used to relate the PO back to the original blanket order. It is set to the blanket order number followed by a sequential number. This tells you the number of releases that have been processed against this blanket order.

The resulting purchase order is managed just like any other purchase order and is included in MRP and all purchasing reports.

Note Unlike sales quotes where you are always happy to sell more than quoted, with blanket orders you cannot release a larger quantity than the one on the initial blanket order.

Receipts

When receipts are made against a PO that was released from a blanket order, the quantity open will be updated for both orders.



Purchase Order Processing

Manual or Blanket Order Release

A purchase order can be entered manually or it can be created by releasing a blanket order. The same information is entered on a purchase order as a blanket order—the difference is that a purchase order must specify a receiving site and a due date.

Both of these are required for planning. Purchase orders are considered by MRP as soon as they are entered.

Ship-To Site

Each line item on a purchase order can specify a different Ship-To site. We cover distributed purchasing later. For now, consider a simple case where multiple sites are managed in a single database. It is possible to enter a PO with line items to be shipped to each site, with each site having a different address.

Sort by Site

Normally a Ship-To address is entered on the PO header and is the address that prints on the PO document. However, if you have different Ship-To sites on each line item, you can elect to sort POs by site when printing. This prints one PO document for each site, with that site's address at the top as the Ship-To. The Ship-To address for each site must be set up in Company Address Maintenance 2.12.

Supplier Hold

Warning if Hold

In some situations, a supplier may be put on hold—perhaps for defective quality or poor delivery. When you begin to enter an order for such a supplier, a warning displays. You may or may not choose to proceed, depending on company policies.

Processing Activities



Intro-eB-Use-135

Processing Activities

In the following activity you:

- Set up your Purchasing Control File
- Manually enter a requisition (optional)
- Create a blanket order and release it (optional)
- Create purchase orders for your component items

Purchasing Control File

- 1 Go to the Purchasing Control File 5.24 and update the record to have the following settings:

Bill to: (Manufacturing Site)

Ship to: (Manufacturing Site)

PO Prefix: PO

Receiver Prefix: PR (Purchase Receipt)

Receiver Type: 1

Ln Format S/M: S (single)

PO Header Comments: No

PO Line Comments: No

- 2 Let all other fields default. Update and exit.

Manually Enter a Requisition (optional)

- 1 Delete Approval Code: OK using Purchase Approvals Maintenance 5.1.1
- 2 Select Purchase Requisition Maintenance 5.1.4 to manually enter a purchase requisition for a component item.
Enter requisitions for each of one of your component items, per the instructor's direction.
Make sure the Approved field is set to Yes.
- 3 Update and exit.
- 4 Review your requisition in Purchase Requisition Browse/Inquiry 5.1.5.

Create a Blanket Order and Release it (optional)

- 1 Add a blanket order using Blanket Order Maintenance 5.3.1. Use one of the suppliers you created.

On the header information, set up the following fields.

Release: Yes

Recurr: Yes

Cycle Code: MO (for monthly)

- 2** Update and go to the line item information.
- 3** Reference your manufacturing site. On the Req field, click the look-up icon and find the requisition that was entered in the previous task.
- 4** Click the requisition number to drag it to the Req field. Continue to the line detail.
Notice that the item number, quantity, and cost are automatically updated from the requisition information.
- 5** While in the line item detail, change the quantity to release to a partial amount of the order quantity.
- 6** Update the order and exit.
- 7** Select Blanket Order Release to PO 5.3.6 to release a PO from the blanket order.
- 8** Reference the Cycle Code MO, enter the blanket order number, and change the due date to a date two weeks in the future.
- 9** Leave all other fields blank. Update.
You should get a message that a purchase order was released.
- 10** Use Purchase Order Browse/Inquiry 5.8 to find the released purchase order for your item.

Create Purchase Orders for Component Items

Instruction: If you created a requisition in an earlier exercise, you may use the requisition when creating your purchase order.

- 1** Manually calculate how many component items you would need to make 100 units of your end item. For the item that has the unit of measure conversion, calculate how much you would need to buy in the purchase unit of measure.
- 2** Use Purchase Order Maintenance 5.7 to enter a purchase order for your component items. Leave the purchase order number blank to default to the next number from your control file.
- 3** Select one of the suppliers that you added to the database.
- 4** Let the header information default from the control file and the supplier address record to the preset values. Enter the manufacturing site on the header. This will be used as a default for the line items.
- 5** Go to the line item data.

- 6** In the line item information, set up purchase order lines for each component for the calculated amount. Make sure you reference your manufacturing site on each line.
Remember to purchase one of your items in a unit of measure different than the stocking unit of measure.
- 7** Update and exit to the trailer.
- 8** Verify that the total cost of the purchase order is correct.
- 9** Update, and exit.

Create a Look-up Browse

- 1** Go to Purchase Order Receipts 5.13.1 and place your cursor in the first field. You see that there is no look-up browse associated with this field. You are now going to create one.
- 2** Press Control F and note the field name.
- 3** Go to Window Help Maintenance 36.4.21 and enter the following:

Field: ordernum
Calling Procedure: Blank
Description: Blank
Procedure to Execute: GPLU072.P
- 4** Save your changes and exit.
- 5** Go back to Purchase Order Receipts and place your cursor in the first field. You see that there is now a look-up browse associated with this field.

5.13.1 – Purchase Order Receipts

Purchase Order Receipts

User Menu Edit Queue Options Help

Order: Supplier: Status: Effective: 01/10/01

Packing Slip: ☐ Move to Next Operation: yes

Receiver: ☐ Receive All: yes

Comments: no

Ship Date:

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Use-140

Purchase Order Receipts

Menu Number 5.13.1

PO receipt transactions are performed when material is received into inventory against an outstanding purchase order. When material is received, inventory is updated as well as the open order quantity on the PO.

Receive All

The Purchase Order Receipts function receives items on a purchase order. This receipt creates a transaction record that updates inventory. If the Receive All flag = Yes, the quantity open for each

line item is received into inventory automatically. If the Receive All flag = No, you update the quantity to receive manually.

Multi-entry

For each line item received, enter the quantity, site, location, lot/serial, and lot reference. If this receipt is to affect more than one site or location, or if multiple lot/serial or lot reference numbers need to be entered, you can use the multi-entry option.

When Multi-entry = Yes, a window opens in which you can enter multiple site, location, lot/serial, and lot reference numbers, and the quantity to receive of each.

Change Status

Another feature of PO receipts is the ability to record inventory characteristics at the time the items are received—the assay %, grade, expire date, and inventory status. These can be recorded here by setting Chg Attributes = Yes and changed using Inventory Detail Maintenance 3.1.1.

Receivers

All PO receipts and returns generate receivers for matching with supplier invoices in accounts payable.

Or, using the Evaluated Receipts Settlement (ERS) functionality, vouchers can be created automatically after items are received to ease payment processing in your Accounts Payable department.

Receiving documents can be printed and attached to the items, or routed to the Accounts Payable department. Complete receiving history is also maintained online.

Processing Activities



Intro-eB-Use-145

Processing Activities

In the following activity you:

- Record receipts against a purchase order
- Check your inventory levels and transaction history

Record Receipts Against a Purchase Order

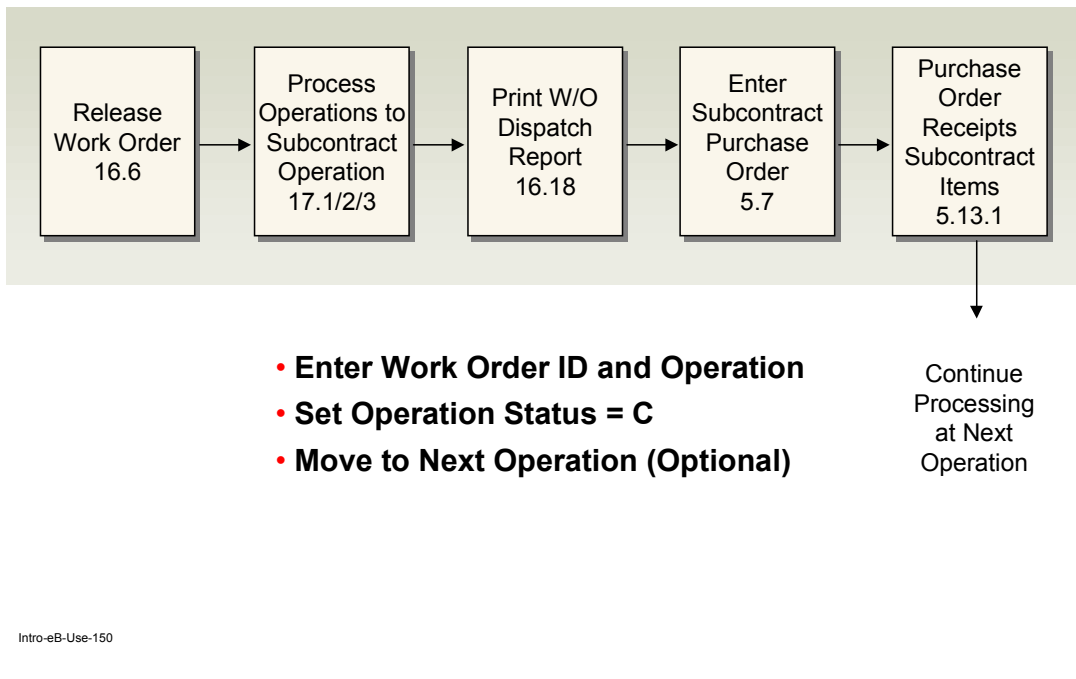
- 1 The supplier has sent the material you ordered for your components. Receive the items into inventory using Purchase Order Receipts 5.13.1.
- 2 Check the purchase order receipts using PO Receipt Packing Slip Inquiry 5.13.4.

- 3** Review the inventory levels for your component items using Inventory Detail by Item Browse/Inquiry 3.2.
- 4** Review the transactions you created when you did the receipt using Transactions Detail Inquiry 3.21.1. Scroll through the records you created in these activities. Look at the transaction type to understand what created the transaction.
- 5** Look at the GL detail, and find the GL transaction number that was created for the last purchase order receipt. What accounts were debited and credited?

Record a Receipt Against a Purchase Order (optional)

- 1** Receive the items into inventory using Purchase Order Receipts 5.13.1.
- 2** Use Blanket Order Browse/Inquiry 5.3.2 to verify that the quantity open and the quantity received have been updated by the PO receipt.

Subcontract Purchasing



Subcontract Purchasing

Standard Procedures

In some companies, manufacturing operations are subcontracted to an outside supplier. When a subcontracted operation is part of a work order, a purchase order can be issued. This enables you to track your subcontract costs and follow standard receiving procedures when the items come back.

PO Line Item Type S

A subcontracted work order operation is scheduled and dispatched just like any other operation. But in this case, the dispatch list is routed to purchasing.

The order line item is type S for subcontract. This tells the system that this item is to be received back into WIP rather than put into inventory.

Work Order ID and Operation

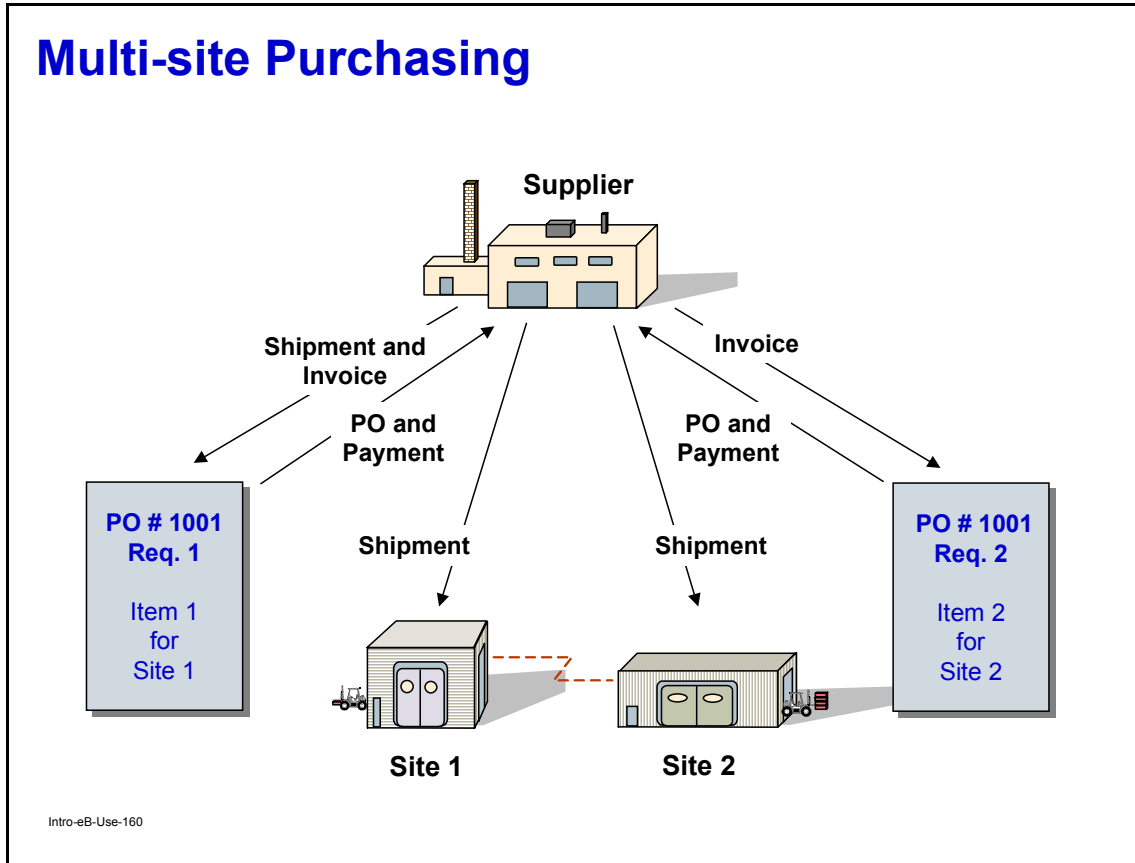
The work order ID and operation can be entered on the line item or recorded at the time of receipt. This determines which WIP account to post the cost and any variance to. Set the operation status to C and the status of the next operation (optionally) to Queue.

Component Usage

The components used during a subcontract operation may be supplied by you or the supplier. When supplied by you, components are recorded in the work order bill and issued to the work order. If inventory is actually held at the supplier location, this should be set up as a different location code and inventory issued from that location.

Structure Code D

When components are supplied by your subcontract supplier, no inventory transaction is required. If you want to record the items in your product structure, use the structure code D, for documentary. This lets you see the complete structure without affecting cost or planning.



Multi-site Purchasing

PO Site

Another option is distributed purchasing. Unlike central sales order processing, purchase orders can be entered at any site and in any database. This is specified at the item-site level. Each purchased item can identify the PO Site.

Uses Requisitions

This works by using requisitions. Each of the individual sites runs its own MRP and generates requisitions for the materials they need. Each of these requisitions specifies a PO Site—this may be

the local site or any other site in any other database. Requisitions may go through an approval process at the local site.

Requisition Print

Each site runs an Approved Requisition Print 5.1.17. This looks at all connected databases and prints any requisitions that specify that site as the PO site. Purchasing can then aggregate all requirements and negotiate one large purchase.

Requisitions and MRP

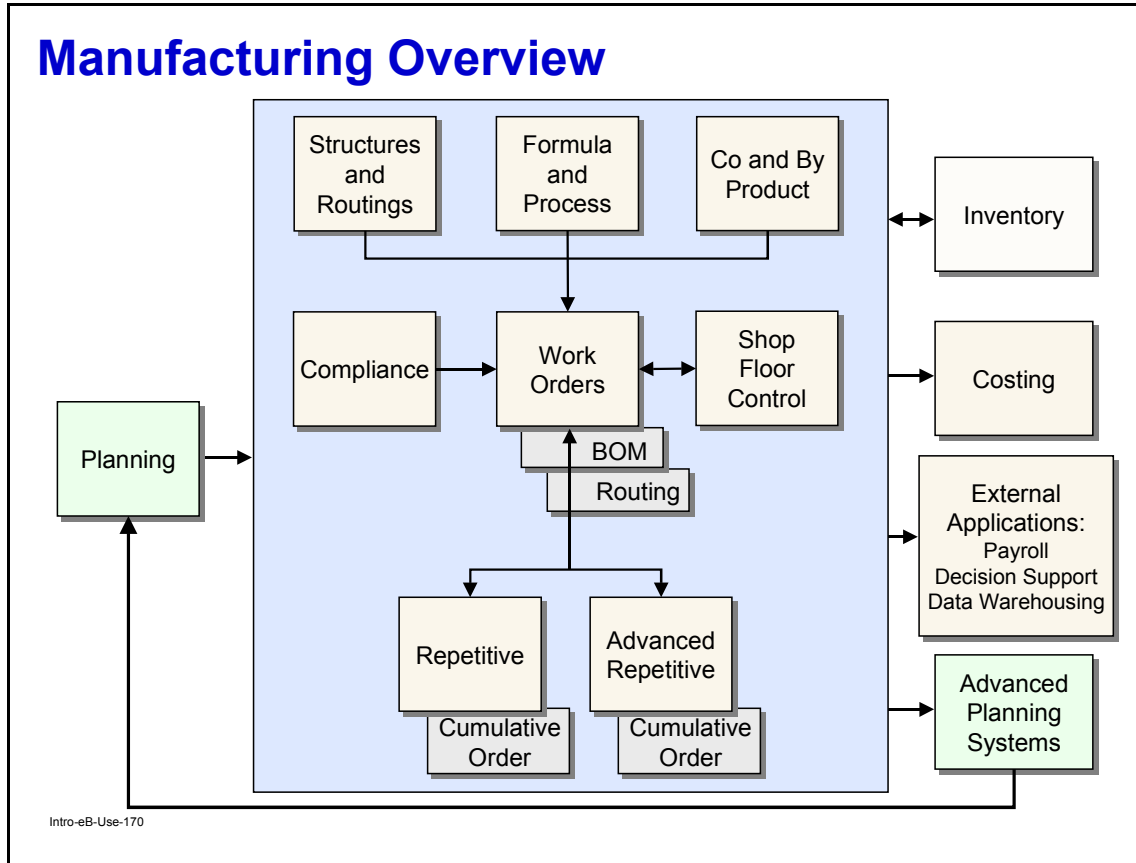
Each purchase order line specifies its requisition number. The system finds that requisition on the network and, if it has been completely satisfied, closes it out. It also notifies MRP at that site of the expected receipt.

Receipts at Remote Site

The supplier ships directly to the remote site; the receipt is processed there, updating inventory and MRP. Since the PO was initiated at another site, the receiving function communicates the receipt back to the PO site where the receiver is stored or to Accounts Payable.

Accounts Payable at Purchase Order Site

Accounts payable activities are managed wherever the PO was entered. Items bought locally are purchased and paid for locally. Items bought remotely are purchased and paid for remotely.



Manufacturing Overview

Different products and processes often require different levels of control and different management techniques. The following are within MFG/PRO eB.

Work Orders

A work order is an authorization to produce a specific quantity of an item by a certain date. Each work order lists component materials and operation steps.

As components are used, issue transactions are recorded; as labor time is spent, shop floor labor is entered. A record of all activities is maintained and can be reviewed, along with the current work-in-process value.

Normally, work orders are used for items with long manufacturing lead times or complex manufacturing processes.

Repetitive Schedules

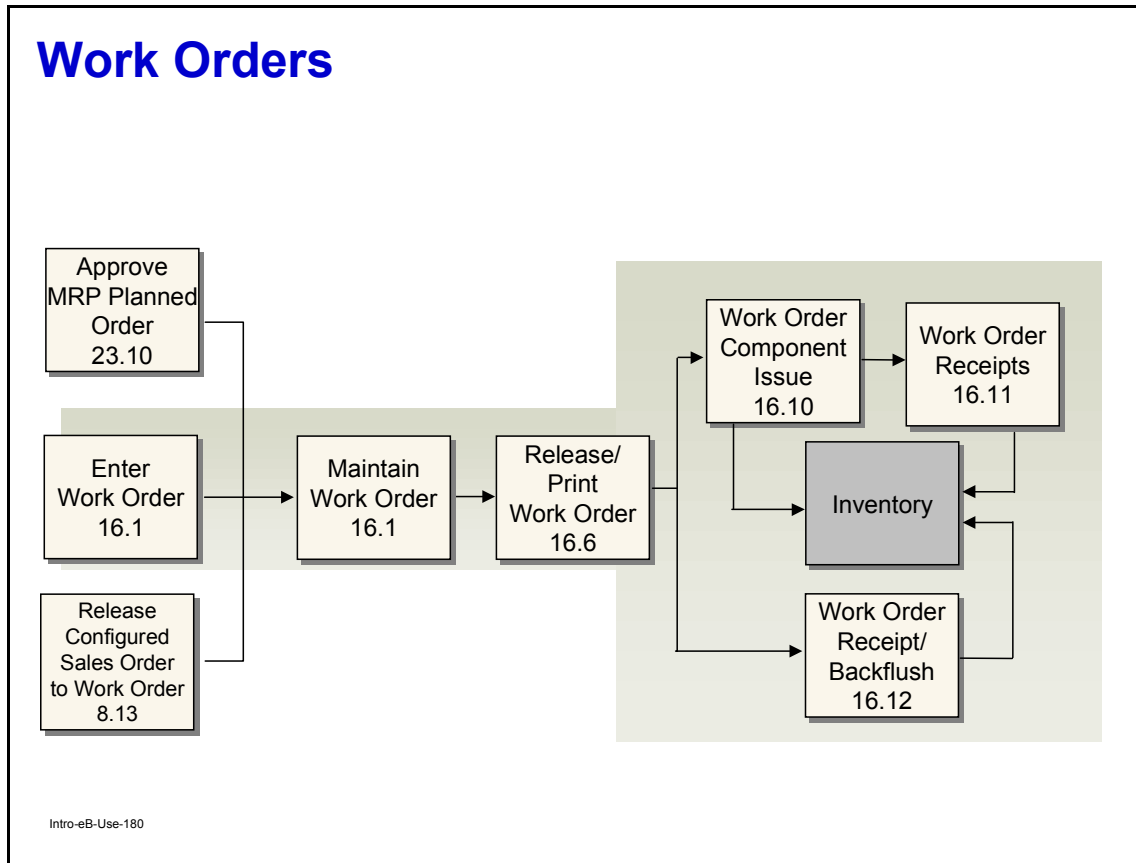
Repetitive schedules are used in high-volume repetitive or batch process environments.

Companies making food or pharmaceutical products schedule and produce large batches of any one product. Component items are piped into one end of the process and finished items come out the other.

Reporting time spent at each operation and for each of the components used would be ridiculous. Instead, you report the number of finished items and the system calculates the amount of component items used, then backflushes that quantity from inventory.

Quality Orders

A special kind of work order is a quality order. These are used to track quality testing—incoming inspections, inventory sampling, lot recertification, or destructive testing. Test results can be entered and printed on a Certificate of Analysis.



Work Orders

Standard Work Order (WO) Process

A work order is an authorization to produce a specific quantity of an item by a certain date. In a standard sequence, a work order is entered, released, materials are issued and received, the work order is closed, and the items are shipped.

Sources of WOs

Each work order is identified by a work order number and a unique ID.

Work orders can be entered manually or generated from MRP, repetitive, or configured sales orders. Work orders are also generated when another work order is split, or when one is released that requires a routable component.

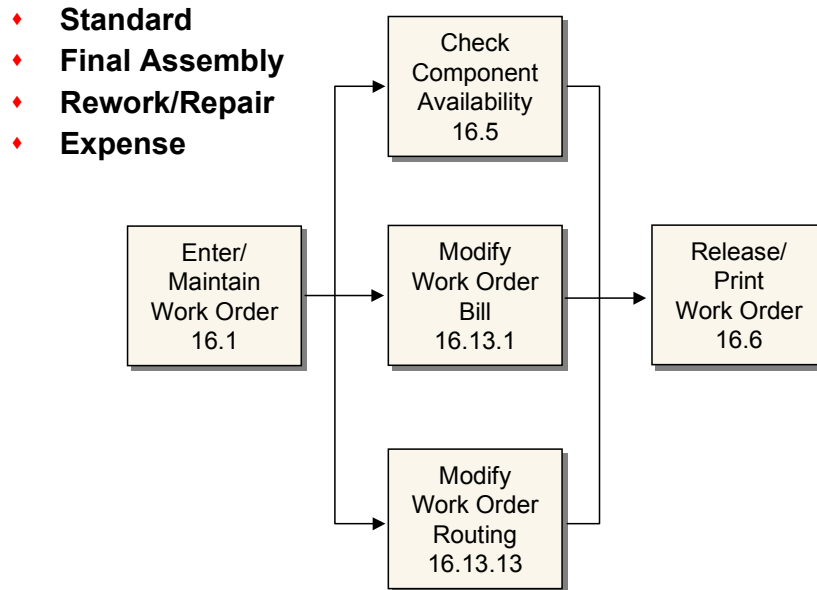
When you enter a work order for a co-product or base process, a work order is created for all joint products in the joint order set based on the joint product structure.

Work Order Status

Each work order has a status code that determines what stage of processing it has reached and restricts what MRP can do to that order. Valid status codes are:

- Planned
 - Created and maintained only by MRP
- Firm Planned
 - Due date and quantity approved by a planner–MRP will not change them
- Batch Input Firm Planned
 - Do not generate component demands until the status is changed
- Exploded
 - BOM and routing are fixed; any engineering changes are applied manually
- Allocated
 - Component items have been reserved for this work order
- Released
 - Picklist and routing have been printed. Usually this means the work is in process
- Closed
 - This work order has been completed

Work Orders: Bills and Routings



Intro-eB-Use-190

Bills and Routings

Standard or Alternate

Each work order has a bill and routing associated with it, identifying the components needed and the operation steps. When a work order is created, it specifies a BOM and routing code. These default based on the type of work order:

- Rework orders have only one component
- Final assembly orders have the components specified on the configured sales order

On standard manufacturing orders the bill and routing default to the standard bill and routing for that item-site, but this can be changed to any approved alternate.

Explode Bill and Routing

Up until the time that the order status is changed to Exploded, the bill and routing are subject to change. Any engineering changes made to this bill and routing are immediately reflected on the work order.

To freeze them, change the work order status to E. This physically copies the designated bill and routing into another set of files called the work order bill and work order routing files. It also schedules the routing operations.

Customized Bill and Routing

Once the bill and routing have been copied to the work order, they can be manually changed as needed. You can add or delete components, change component quantities, adjust operation start and stop dates, and add or change operations. This enables you to customize the bill or process for any single work order.

16.13.13 – Work Order Routing Maintenance

Work Order Routing Maintenance		
User	Menu	Edit Queue Options Help
Work Order: 400018	ID: 401609	
Item Number: 44-100	CONTROL UNIT, HOME I	
Operation: 10		
Standard Operation:		
Description: ASSEMBLE PER SPEC		
Work Center: 12000	Machine:	ASSEMBLY, CONTROLLE
Qty Ordered: 10.0	Std Setup: 0.0	Act Setup: 0.0
Qty WIP: 0.0	Std Run: 1.0	Act Run: 0.0
Run Complete: 0.0		
Sub Complete: 0.0	Std Move: 0.0	Machines per Op: 1
Qty Reject: 0.0	Queue: 0.0	
Qty Rework: 0.0	Wait: 0.0	Status:
Start Date: 02/27/97	Setup Crew: 0.00	Tool Code:
Due Date: 02/28/97	Run Crew: 1.00	Supplier:
	Overlap Units: 1	Yield: 100.0%
	Subcontract LT: 0	Comments: no

Intro-eB-Use-200

Work Order Routing Maintenance

Menu Number 16.13.13

Operation Scheduling

The work order routing lists each of the operations required by a work order. Each of these is scheduled to take place at a particular work center/machine and scheduled to take a designated amount of time.

Operations are scheduled backward from the due date of the work order using the quantity ordered.

Scheduling begins with the last operation and works backward, assigning each operation a scheduled start and due date. This process considers multiple machines, overlaps, and work center/machine calendars.

Start and due dates can be adjusted manually.

Updated by Shop Floor Control

As the work order proceeds through the manufacturing process, each operation is updated to reflect the current quantity in WIP, the operation status, and the actual set-up and run times.

Standard set-up and run times can be changed for each operation, but this should only be done when the standard is actually being changed for the order.

Actual set-up and run times can also be modified in Work Order Routing Maintenance 16.13.13.

When using Shop Floor Control (17), do not use Work Order Routing Maintenance to modify actual times. It would not adjust WIP values, resulting in unusual cost variances.

16.13.1 –Work Order Bill Maintenance

Work Order Bill Maintenance	
Work Order: 400018	ID: 401609
Item Number: 44-100	CONTROL UNIT, HOME I
Status: RELEASED	
Component Item: 44-3000	'SMART' POWER CONVE
Operation:	
Qty Required: 10.0	Qty Per Unit: 1.0
Qty Allocated: 10.0	Unit Cost: 100.000
Qty Picked: 0.0	
Detail Allocations: yes	
Qty Issued: 0.0	
Site: 10000	
Location: 12000	
Key Item: no	
Issue Date: 02/27/97	
Deliver To:	

Intro-eB-Use-210

Work Order Bill Maintenance

Menu Number 16.13.1

The work order bill lists each of the components required by a work order. The quantity required is calculated based on the standard bill of material referenced on the work order. In the work order bill, the quantities of components allocated, picked, and issued are displayed and allocations can be modified.

Phantoms

Some of these components may be phantom items—items that are called for in the bill but not normally stocked. In the discrete world, an example may be an automotive wire harness; it has a drawing but is assembled as part of another item. You would not want to stock it.

In the process world, many intermediate products could be classified as phantoms; they are mixtures that are piped directly into the next stage of the process.

Use-up Logic

Phantom items may be called for in the standard bill, but when MFG/PRO eB explodes through the phantom, it lists its components in the work order bill (and picklist). Use-up logic checks first to see if there is any inventory for the phantom. If there is, it plans to use that first.

Floor Stock

Some items may be designated as floor stock (Issue Policy = No). You can print these on the picklist, but they are not issued to the work order. They are directly expensed.

Work Order Allocations

	General Allocations	Detail Allocations
Work Order Status (A)llocated	Automatic	Not Applicable
Work Order Bill Maintenance	Manual by Option	Manual by Option
Work Order Status (R)eleased	Converted to Detail	Automatic
Work Order Release/Print	Converted to Detail	Automatic

Intro-eB-Use-220

Work Order Allocations

Allocated Status

The work order bill not only lists each of the components, it also tracks the quantity that has been allocated, picked, and issued for each. When the work order status is changed to Allocated, the system allocates the components needed for this work order. Like sales orders, work order allocations are based on inventory availability.

General Allocations

Normally, general allocations are sufficient until the work order is released and the picklist is printed. General allocations make sure that the necessary components are available when you release the work order.

Picklists

Detail allocations enable you to use a particular lot/serial number or select components with specific characteristics.

Work order picklists always print details of items to be picked, locations, lot/serial, and lot reference numbers.

If you have not detail allocated, the system decides which items to pick based on the picking logic selection you have defined in the Inventory Control File 3.24. This can pick by location, lot/serial number, or expiration date.

Critical Item

Some item parameters determine how inventory is allocated to work orders. Allocate Single Lot specifies that only one lot can be used on a single order. (You would never mix dye lots of fabric.) If the order cannot be completely satisfied from a single lot, the item is not allocated. Other items may be designated as Critical. A work order cannot be released if a critical component is not available.

Expired inventory is never allocated, and cannot be issued. Inventory is considered expired if it is due to expire within the next few days as specified by the Issue Days parameter in the Inventory Control File 3.24.

Processing Activities



Intro-eB-Use-225

Processing Activities

In the following activity you:

- Update the Work Order Control File
- Manually add and release a work order

Update the Work Order Control File

- 1 Select Work Order Control File 16.24 and make sure that the settings are as follows:

Auto W/O numbers: Yes

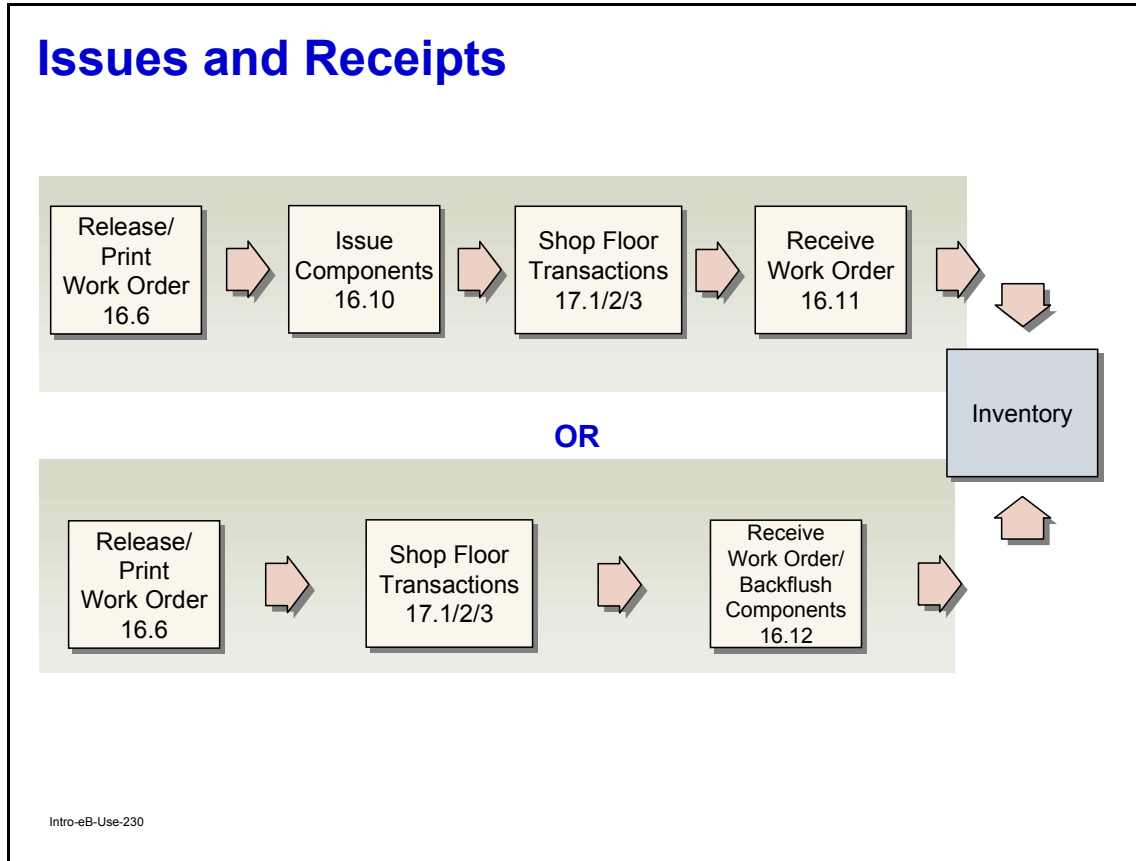
Next W/O nbr: default

Work Order Comments: No
 Routing Comments: No
 Move First Operation: Yes
 Post Variances at SFC: Yes

- 2 Update and exit.

Manually Add and Release a Work Order

- 1 Select Work Order Maintenance 16.1 to add a new work order record.
- 2 Let the next work order number and ID number default from the control file.
- 3 Create the work order for 100 units of your end item at your manufacturing site.
- 4 Let the other field values default. Update.
- 5 Review the order just entered in Work Order Browse/Inquiry 16.2. What is the status of the order?
- 6 Use Work Order Release/Print 16.6 to release the work order. This function will also print the work order picklist and routing (also known as the shop paper).
- 7 Use Allocated Inventory Inquiry 3.18 to find out how many of each component item has been allocated and picked for the work order.
- 8 Find the new status of the order using Work Order Browse/Inquiry 16.2. What is it?



Issues and Receipts

Once a work order is released, its progress is tracked using shop floor functions to record labor and work order functions to record material usage and completions.

Issue or Backflush

Normally, components are issued to a work order using Work Order Component Issue 16.10, and completed items are received using Work Order Receipt 16.11.

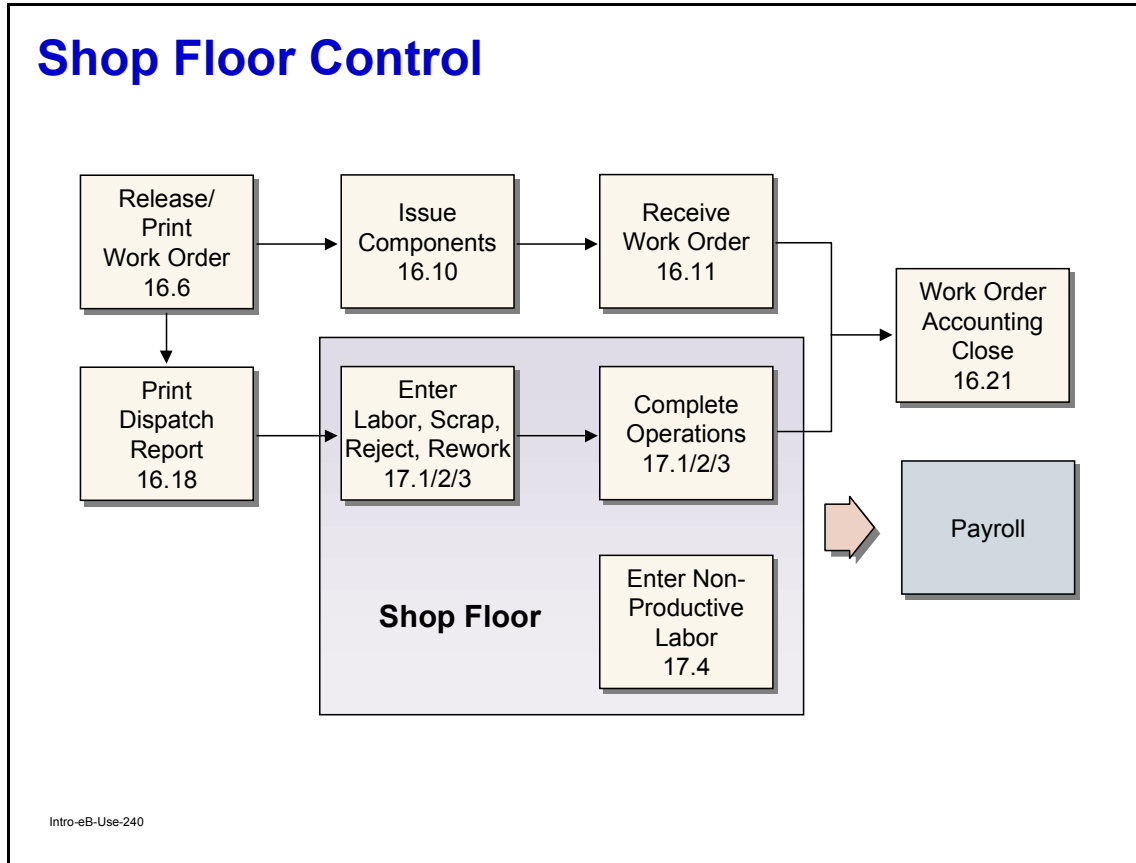
Another option is to backflush the components based on the quantity received in Work Order Receipt Backflush 16.12. Both the issue and backflush let substitutes be issued and issue quantities be changed.

You can also issue additional items that were not in the original work order bill. These are considered unplanned issues.

Shortage Report

If all of the components are not issued, a shortage report can be generated. As with any other MFG/PRO eB order, multiple issues and receipts can be processed against any order.

Sometimes when there are shortages, a portion of the work order quantity is moved ahead while the rest waits for the missing items. This is done by Work Order Split 16.9. Once split, each work order is tracked separately through the manufacturing process.



Shop Floor Control

Labor and Material

Labor and material movements are tracked in the Shop Floor Control module. It requires that you set up at least one employee. If you are using the Payroll module, all of your hourly employees are set up there. Shop floor reporting creates time card entries for generating paychecks for hourly or piece rate employees.

Operation Status

Labor feedback is done by work order, employee, or work center/machine. In all cases you must identify a released work order.

As labor is recorded, operation status is updated to either Setup, Running, or Complete. When work moves on to the next operation, its status changes to Queue.

Labor Reporting

If labor is reported only at a few key operations, called milestones, the Operation Complete Transaction 17.5 can be used to complete the current operation and the ones that have come before it.

If no labor has been reported against these previous operations, actual labor is set to the labor that should have been used to make the quantity reported complete, referred to as earned labor.

Nonproductive Time

In order to account for all work hours, nonproductive time can also be recorded. This is time not spent working on a specific manufacturing order—clean-up time, downtime, meetings, breaks, or time spent waiting for work.

Variances

Variance		Calculated By
Labor Rate and Usage Variance	→	Shop Floor or Repetitive Feedback (or at Work Order Receipt)
Burden Rate and Usage Variance	→	
Material Rate Variance	→	Component Issue or Backflush
Subcontract Rate Variance	→	Subcontract Purchase Order Receipt
Applied Overhead	→	Work Order or Repetitive Receipt
Material Usage Variance	→	
Subcontract Usage Variance		Work Order Accounting Close
Floor Stock		
Method Variance		

Intro-eB-Use-250

Variances

One important aspect of the entire manufacturing process is the management of cost. In a standard cost system, each item has a standard cost calculated based on the standard bill and routing. But each time the item is made, the cost may be somewhat different. This is tracked as variances.

In MFG/PRO eB, variances are calculated and posted automatically throughout the manufacturing process. The illustration above lists the variances and when they are calculated.

Rate Variances

These reflect a difference between the standard cost and the price actually paid. The employee who did the work is paid more or less than the standard work center rate, the subcontractor charged

more or less, or the material used had a different GL cost than the item listed on the work order bill. This last one may mean that a substitute item was used, or that materials were issued from another site with a different cost. It could also mean that the GL cost has changed since the work order bill was created.

Usage Variances

These reflect a difference between the standard quantity and the quantity actually used—more or fewer hours or more or less material.

Both are calculated based on the quantity of inputs that should have been used to get the quantity reported as received—referred to as earned hours or earned materials.

Method Variance

When a work order is completed, the Work Order Accounting Close 16.21 is run to clear out any balance remaining in work in process.

After all other sources of costs and variances have been accounted for, any remaining amount in work in process is posted as a method variance.

Processing Activities



Intro-eB-Use-255

Processing Activities

In this activity you:

- Issue components to a work order
- Report labor to a work order
- Receive and close a work order

Issue Components to a Work Order

- 1 Use Work Order Component Issue 16.10 to issue components from your inventory to your work order. Set the Issue Alloc. and Issue Picked flags to Yes to make your transactions more automatic.

By overriding the data in the transaction frame, you can change the quantity issues or the location from which the items are issued.

- 2 Update and exit.
- 3 Select Work Order Bill Maintenance 16.13.1 and enter your released work order number.
- 4 While on the component item field, scroll with your next/previous keys to view the component detail for this order.
- 5 Use Allocated Inventory Inquiry 3.18 to review how many of each component is now in inventory.

Report Labor to a Work Order

Work Order Labor transactions are recorded in the Shop Floor Control Module.

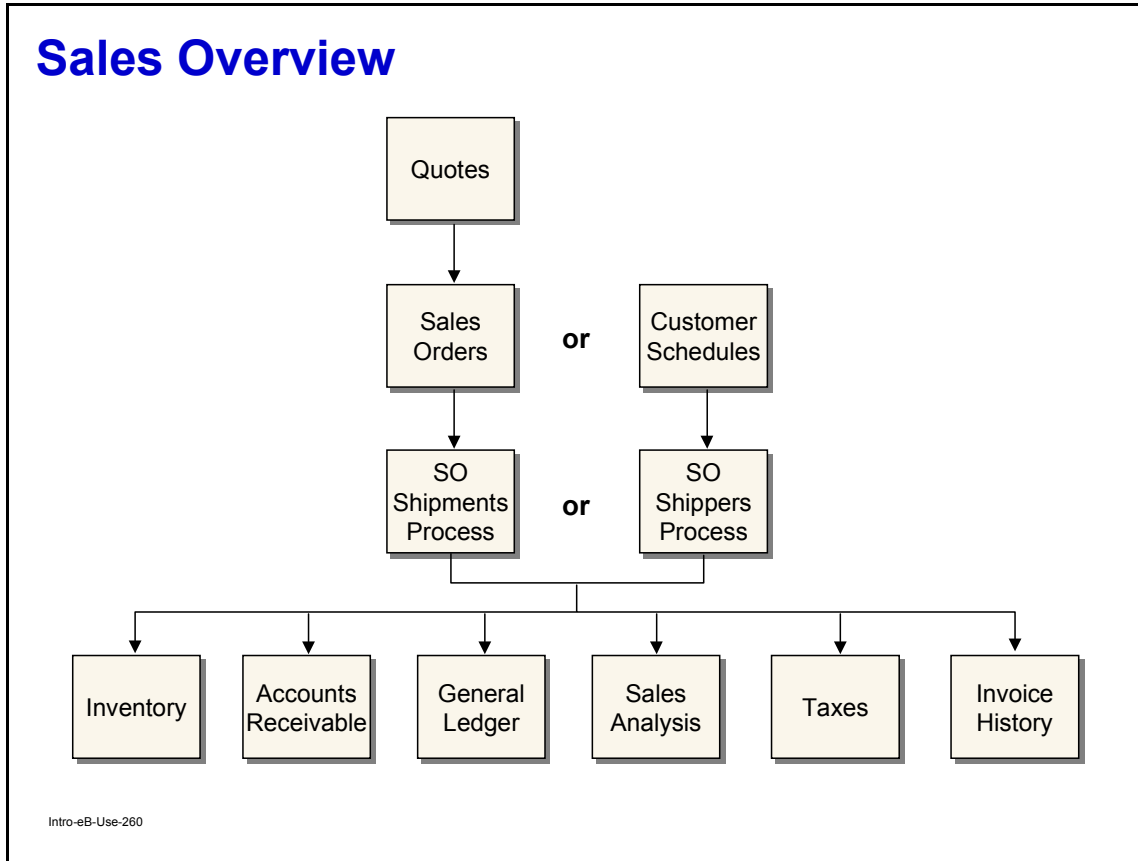
- 1 Manually calculate how much labor for set-up and run time you need to complete all 100 units of your work order at each operation. (These numbers are on the routing that was printed for the work order.)
- 2 Assume the shop has now built the units, and use Labor Feedback by Work Order 17.1 to report labor and units completed at each operation on your routing, based on your calculation above.

Note Use the employee you created in the exercise “Add Yourself and a Colleague” (page 44).

- 3 At each operation, report the units complete and the elapsed set-up and run times.
- 4 In Operation Transaction Detail Inquiry 17.9, look at the transactions created when you reported labor.
- 5 Select Work Order Routing Maintenance 16.13.13 to review your work order routing. Check how many units have been completed at each operation and how much labor was used for each operation.

Receive and Close a Work Order

- 1** Use Work Order Receipt 16.11 to receive the end item units from the work order into inventory. Enter 100 units as the quantity to complete and set Close = Yes.
- 2** Update and exit.
- 3** Transfer the inventory of the finished item from your manufacturing site to your distribution site using Transfer – Single Item 3.4.1.
- 4** Review the amount of inventory you have on hand using Inventory Detail by Item Browse/Inquiry 3.2.



Sales Overview

The starting point of the sales process is the customer order, but how it is processed depends on the type of order and its source. Sales orders may come into this process in different ways.

High Volume

Customer schedules are used in high-volume, repetitive sales operations. Each customer order may specify hundreds of items with multiple delivery dates. Customer schedules are designed to accept customer orders via Electronic Data Interchange (EDI). Requirements are expressed as quantity per item per due date, with multiple due dates and quantities for any item.

Low Volume/High Price

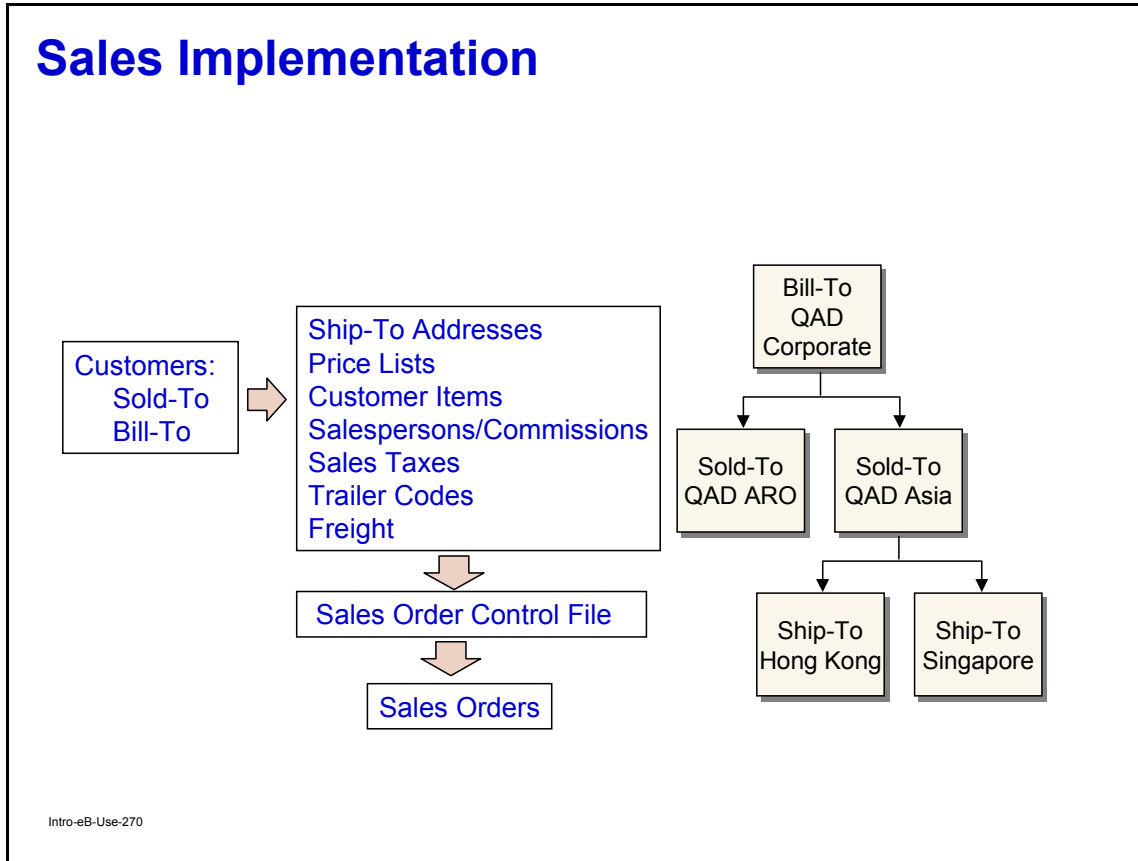
Companies that manufacture low-volume, high-priced items, such as machinery, may go through a sales quote process before a sale is made. You submit a bid (quote) and when this bid is accepted, it becomes a sales order. In other companies, the quote process is bypassed, and the sales order is entered directly.

Configured Products

MFG/PRO eB enables you to select from two different shipment processes for either customer schedules or sales orders.

Sales Order Shipments 7.9.15 enables you to print a packing list and ship a single order, later processing an invoice and posting sales to GL. The shipper process enables you to build a shipment to a customer and ship multiple orders or schedules in one shipment. Items can be put into containers and tracked.

ASNs (advance shipping notices) and invoices can be sent via EDI to your customers.



Sales Implementation

Before starting to use sales order functions, it is necessary to establish some basic information:

- Customers
- Credit terms
- Salespersons and commission rates
- Add-on sales charges
- Tax rates

Each customer can be assigned to a specific salesperson and set up with standard credit terms and taxes. There are three types of customers:

- 1** Sold-To (required)
- 2** Bill-To
- 3** Ship-To

Customer Addresses

- Bill-To and Sold-To addresses are entered in Customer Maintenance 2.1.1
- Ship-To addresses are entered in Customer Ship-To Maintenance 2.1.13
- Credit data is collected and reported against the Bill-To address assigned on each sales order

New Ship-To addresses can also be entered as you enter a sales order without having to exit Sales Order Maintenance 7.1.1.

Sales Order Pricing

- ♦ Classify customers and products into groups
- ♦ Volume price breaks for multiple items
- ♦ Setting up price lists
- ♦ Best price with all qualifying price lists considered

Intro-eB-Use-280

Sales Order Pricing

Through the use of analysis codes, price lists define the information necessary to price a sales order line correctly according to the customer and the item you are shipping. A price list applies to the customer or item code you assign to it as follows:

- A single item number
- A single customer number
- A group of customers belonging to an analysis code
- A group of items belonging to an analysis code
- All customers

The Amount Type field in Price List Maintenance 1.10.1.1 defines the purpose of a price list. There are several discount types; they can be combined.

A price list can also define minimum quantities, effective dates, and other information to extend to your customers.

Key discount types to be entered in the Amount Type field include:

List Price

- Used as the item list price and to set allowable minimum and maximum prices

Discount %

- Discounts are percentages taken from the item list price

Discount Amount

- Discounts are amounts subtracted from the item list price

Net Price

- Discounts result in a fixed price

When an order is entered, MFG/PRO eB determines which price lists apply, examines those lists, and determines which of them yields the best price for the order.

A combination type is assigned to each price list that describes how a price list can combine with other price lists for multiple discounts and best pricing calculations.

The Net Price value can be overwritten during order entry if the user has access to the field and the value does not fall outside the minimum and maximum price boundaries.

7.1.24 – Sales Order Control File – Frame 1 of 3

Sales Order Control File

User Menu Edit Queue Options Help

1. Qty Available to Allocate = Qty Available - Qty Allocated
 2. Qty Available to Allocate = Qty Available - Qty Allocated + Qty On Order
 3. Qty Available to Allocate = Qty Available - Qty Required
 4. Qty Available to Allocate = Qty Available - Qty Required + Qty On Order
 Which calculation should be used for Qty Available to Allocate: **4**

Allocate Sales Order Lines due in Days.: **10** (0 for no allocations)
 Limit Allocations to Avail to Allocate: **yes** Detail Allocations: **no**

Pick Only Allocated Lines: **yes** Sales Order Prefix: **SO**
 Are Sales Orders Printed: **yes** Next Sales Order: **10014**
 Keep Booking History: **yes** Invoice Prefix: **IV**
 Keep Invoice History: **yes** Next Invoice: **10001**
 Shipping Lead Time: **0** Integrate with AR: **yes**
 Company Address: **TRAIN** Integrate with SA: **yes**
 Sales Order Header Comments: **no** Integrate with APM: **no**
 Sales Order Line Comments: **no** Confirmed Orders: **yes**
 Print Only Lines to Invoice: **no** Fiscal Start Month: **1**
 Ln Format S/M: **multi** F.O.B.: **Shipping Point**

Frame 2 of 3

Use Enterprise Material Transfer: **no**
 EMT Type: **abcd**
 EMT Sequence: **abcd**

A-Item/Site
 B-Item
 C-Customer
 D-Sales Order Control File

Auto EMT Processing: **no**
 Calculate Due Date: **no**
 Direct Allocation: **no**
 Direct Shipment Location:
 Auto Accept Supplier Changes: **yes**
 Use Customer Currency On PO: **yes**

Intro-eB-Use-290

Sales Order Control File

Menu Number 7.1.24

Using Allocations?

The Sales Order Control File 7.1.24 determines how products are allocated (that is, reserved) for an order.

If you are not using allocations, set Allocate Sales Order Line due in Days to 0 and Limit Allocations to Avail to Allocate to No. The shipping department will then decide shipment priority.

Quantity Available Calculation

In most cases, you will allocate using calculation 1. This calculates the quantity available for a new order (including released work orders) by subtracting the quantity already allocated to near-future orders. Define the near future in the Allocate Sales Order Lines due in Days field.

Calculations 2 to 4 are not time-sensitive and allocate all quantities demanded, even for orders due six months from now. Calculations 2 to 4 examine the total demand in the system, including demand from MRP.

Detail Allocations

Detail Allocations = Yes specifies whether allocations are made from specific lot/serial numbers or locations (can be overridden) during sales order entry.

Detail Allocations = No lets the system specify lot/serial numbers or locations when the sales, distribution, or work order picklists are printed.

If you use allocations, you will usually set Pick Only Allocated Lines to Yes, which means picklists (that is, packing instructions) are printed only for allocated items.

7.1.24 – Sales Order Control File – Frame 3 of 3

Calculate Freight by Site:	yes		
Comm on Margin not Sales:	yes		
Hold Orders Over Credit Limit:	no		
SO Interest Accrued Acct:	4500		
SO Interest Applied Account:	1280		
Price Table Required:	no	Auto Batch Confirmation:	no
Disc Table Required:	no	Confirmation Batch ID:	
Vary Pricing Date by SO Line:	yes	Confirmation Printer:	
Minimum Shipment Amount:	0	Pend Inv Update ISB:	no
SO Edit ISB Defaults:	no	Auto Batch Shipment:	no
SO Returns Update ISB:	no	Shipment Batch ID:	
Forecast Consumption		Shipment Batch Printer:	
Consume Fwd:	0		
Consume Back:	0		
Check Customer Item Nbr First:	no	Nontaxable Trailer Code[1]:	10
Taxable Trailer Code[1]:	10	Nontaxable Trailer Code[2]:	11
Taxable Trailer Code[2]:	11	Nontaxable Trailer Code[3]:	20
Taxable Trailer Code[3]:	21		

No help available for this field field-help-tool

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy Ctrl-V=Paste

Intro-eB-Use-291

Default Commission

You can set the control file so the system will add a specified number of calendar days to the order date to calculate the default date on sales orders.

To calculate commissions based on the sales margin, enter Yes in the Common Margin not Sales field. Enter No for calculations based solely on sales amount.

Use Line Item or Order Due Date for Pricing

Price by SO Line Due Date tells the system which date (line item due date or header order date) to use when selecting line item prices from price lists.

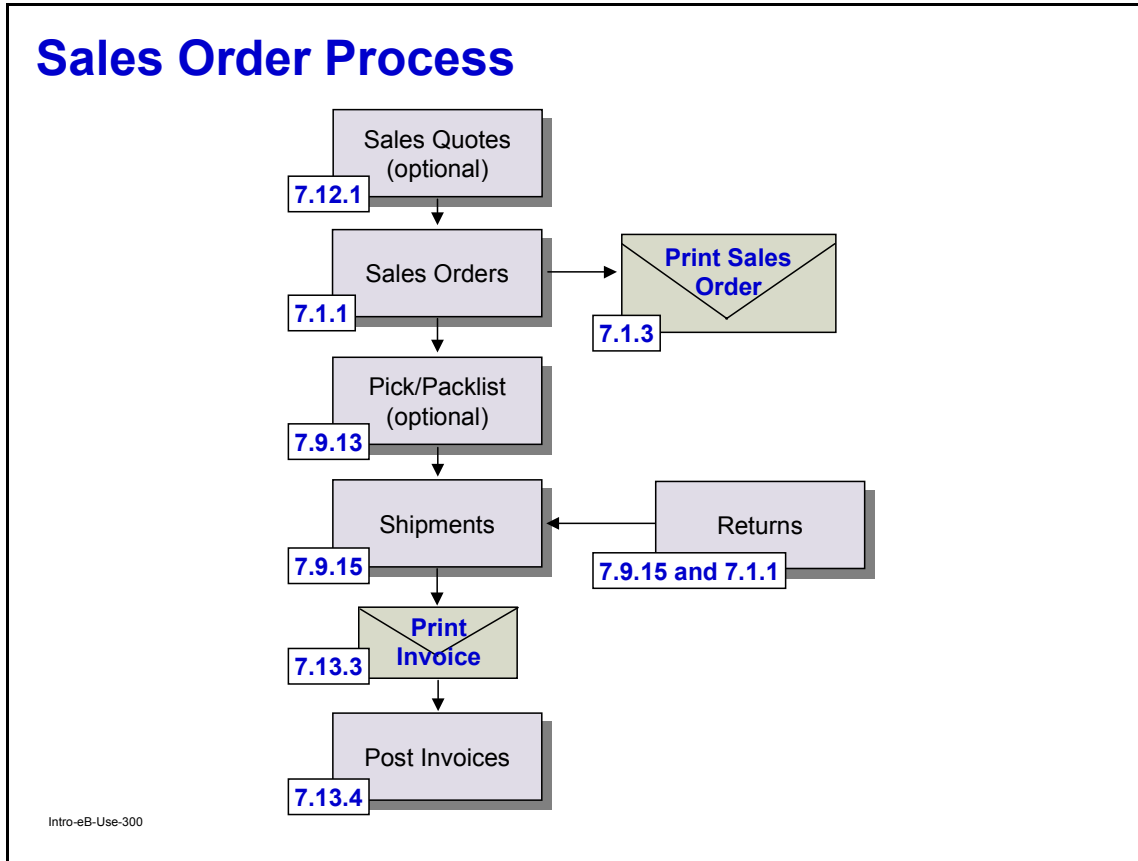
If Yes, when you are in single-line mode, a pop-up window appears for overriding the line item due date for individual line items.

If No, the order due date from the header is used. The pop-up window does not appear when you are in multi-line mode.

Minimum Shipment Batch Confirmations and Shipments

Set a minimum order value with the Minimum Shipment Amount field. If an order is below the specified minimum, a warning displays.

Other options enable you to confirm new sales order lines in batch, process shipments in batch, and define the Next Batch ID value and the batch printer.



Sales Order Process

A sales order can either be added directly in Sales Order Maintenance 7.1.1 or be released from a previously entered sales quote. A hard copy document of the order can be printed and sent to the customer. Revision numbers and print flags can be set to prevent more than one copy of the order being sent to the customer.

After a sales order has been entered and is ready to be shipped, a picklist can be printed. When the picklist is generated, any allocated quantities on the order are incremented as picked. The picklist document can be placed inside the shipping box as a packing list. Inventory is not incremented until a shipping transaction is performed.

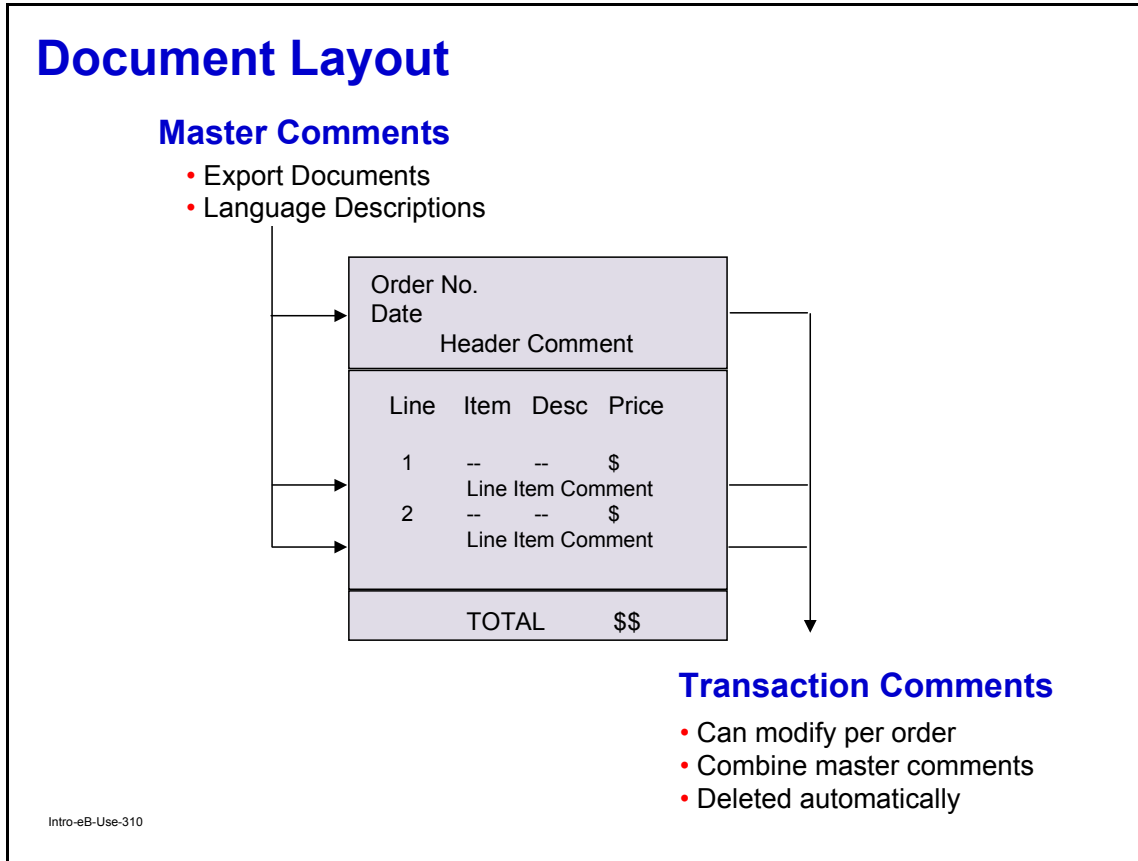
The shipment transaction creates a pending invoice that does not increment sales until the invoice is printed and is posted to the General Ledger.

Allocations and printing a picklist are optional tasks and should be evaluated for their usefulness during each implementation. Credit checking should be done at order entry or just after.

Instead of using the picklist and shipments functions, it is possible to use the Container/Shipper functions with a standard order.

This type of shipper enables you to ship more than one order at a time and send information—what they can expect in the shipment and its shipping information—to your customer prior to the actual shipment.

With shippers, you can use the Auto-Invoice feature, which automatically sets up an invoice to be transmitted via EDI and updates the customer balance when the shipper is issued.



Document Layout

Sales quotes and sales orders are organized in the same way. Each has a header, one or more line items, and a trailer. Order data is entered and printed in this sequence.

Header

The header includes information that applies to the entire order—the order number and date, customer name and address, the Ship-To name and address, credit terms, freight list, and shipping remarks.

Comments may follow, describing in more detail the terms or instructions associated with this order.

Line Items

The line items list all items on the order—the item number, unit of measure, order quantity, price, and due date.

Items may be inventory items or non-inventory items (services or miscellaneous items).

Comments may follow each line item, describing in more detail the item, its specifications, or packaging instructions.

Trailer

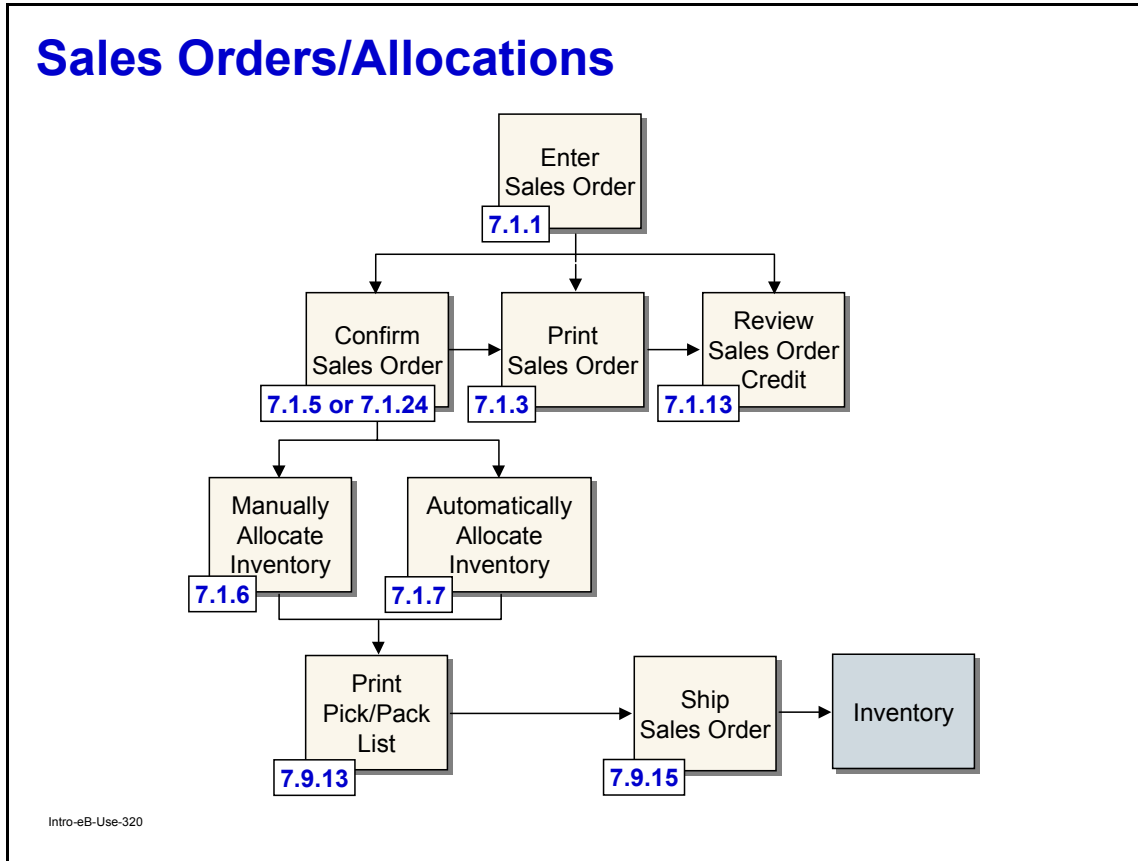
The trailer presents the total for the entire order and any taxes and discounts that apply. Additional charges may be added to the trailer. Freight is calculated automatically on a bulk or unit basis. These charges are not subject to commission or discount, and may or may not be taxable.

Comments

Comments can be entered manually on each quote and order or copied from pre-existing master comments and modified as needed. Master comments are useful for storing standard information, such as:

- Item specifications
- Quality requirements
- Item descriptions in other languages
- Export documentation
- Packaging instructions

Each master comment is identified by a reference code, type, language, and page number (up to 99 pages of text).



Adding a Sales Order

A sales order can be entered manually or it can be created by releasing a sales quote. The same information is entered on a sales order as a sales quote. However, a sales order must specify a shipping site and a due date. Both are required for planning.

Unconfirmed Orders

Usually, MRP sees a sales order as soon as it is entered. But you can take an order that you do not want MRP to see until it has been approved (or a deposit received) by flagging it Confirmed = No.

An unconfirmed order is like a sales quote; it is not considered by MRP, it does not update the forecast, and it does not update booking history. Unconfirmed orders cannot be shipped until they are confirmed.

Credit Checking

When you enter a quote or order, the Bill-To customer's accounts receivable balance is checked against its established credit limit. If the customer is over their limit, you get a warning. You can still take the order, but you can flag it as unconfirmed.

The credit limit is checked again after the entire order is entered, ensuring that this quote or order has not put the customer over the limit. If it does, you get a warning and can place the quote or order on credit hold.

When a customer is on credit hold, any new orders are automatically placed on hold. Picklists cannot be printed for orders that are on hold.

Automatic Credit Hold and Approval functions are available to remove (and place) credit holds based on changes in a customer's receivable status.

Sales Order Allocations

	General Allocations	Detail Allocations
Sales Order Maintenance	Automatic by Option	Manual by Option
Sales Order Auto Allocations	Automatic by Option	Not Applicable
Sales Order Manual Allocations	Automatic by Option	Manual by Option
Sales Order Packing List Print	Converted to Detail	Automatic

Intro-eB-Use-330

Allocations

Once a sales order is entered and confirmed, you prepare the order for shipping. This process involves reserving (or allocating) inventory to the order and printing a picklist.

As you take sales orders, the system accesses the inventory information in the system and shows you the current availability of each item.

Once you promise a customer delivery based on this availability, you can use allocations to reserve the inventory so that it will not be promised to another customer.

There are two types of allocations maintained in the system—general and detailed.

General Allocations

- Reserve inventory at the item-site level

Normally these are created automatically when the sales order is entered

When you buy an airline ticket, the airline allocates a seat for you. This is a general allocation—you have a seat but you do not know which one.

Detail Allocations

- Reserve inventory from specific locations, lot/serial and lot reference numbers

In our airline example, this happens when you get a boarding pass—now you know what seat you are in. It is detail allocated to you and no one else should be assigned to the same seat.

Allocations can be entered during order entry or after, automatically or manually.

Although allocations are optional, their use gives the sales department control over what ships. Procedurally, picklists are printed only for sales orders with inventory allocated to them, and shipments are processed only if you have a picklist. The sales department manages all sales order allocations.

Automatic or Manual

Allocations can be done at several stages, automatically or manually. At order entry time, usually only orders due to ship within a certain number of days have inventory allocated to them. (This is an option set up in the Sales Order Control File 7.1.24.) Normally this is a general allocation, but detailed allocations can also be made manually.

Detail for Specific Characteristics

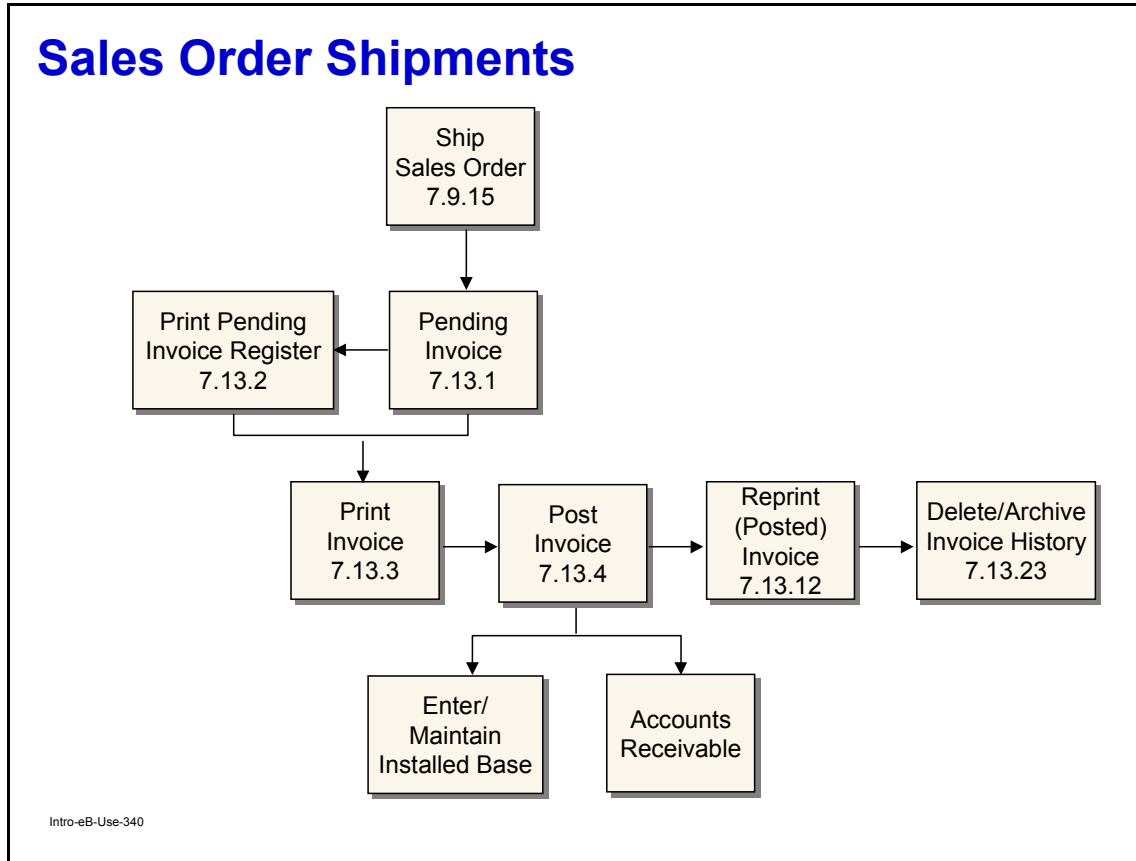
If an order is not allocated at order entry time, it is allocated automatically or manually at some later date, usually closer to its ship date.

Automatic allocations can be run each day prior to printing picklists. This allocates available inventory to open orders by due date.

If there is a shortage, manual allocations can be used to override the selection—perhaps giving each order a partial quantity or shipping all the stock to your best customers.

Sales order picklists always print details: what items are to be picked, from what locations, lot/serial, and lot reference numbers.

If you have not detail allocated, the system decides which items to pick based on the picking logic selection you have defined in the Inventory Control File, by location, lot/serial number, or expiration date.



Sales Order Shipments

After allocations are determined and a picklist is printed, the sales order is shipped.

This physically decreases the quantity on hand for each of the items that were shipped, and generates a GL transaction to decrease (credit) inventory and increase (debit) cost of sales.

(Note that printing a picklist does not affect inventory balances; it just flags the items as picked and detail allocates them.)

Shipping a sales order automatically flags it as ready for invoicing. Normally in MFG/PRO eB, an invoice document is generated for each shipment. You ship the items, print the invoice, and post it to Accounts Receivable.

However, you can combine multiple shipments and sales orders on one invoice. Print and post are separate steps. If an error is found when you print an invoice, fix it in Pending Invoice Maintenance 7.13.1 and reprint it. Once the printed invoice is correct, it is posted.

The post function generates a Dr/Cr Memo in the Accounts Receivable module and updates the customer's open account balance. Posting an invoice also updates GL account balances for:

- Sales and AR
- Salesperson quota and commission history
- Sales tax journals
- Sales analysis history.

The Sales Analysis module keeps sales history by customer, product line, item, salesperson, and site and is useful for summarized reporting by calendar month. Also, Sales Analysis data is needed to use Forecast Simulation 22.7.

Invoice History

Once posted, the invoice can be maintained in invoice history. This is useful for reviewing problems and configured product information, or reprinting lost invoices.

Processing Activities



Intro-eB-Use-345

Processing Activities

In the following activity you:

- Modify the Sales Order Control File
- Add a sales order record
- Print a packing list, and ship the sales order

Modify the Sales Order Control File

- 1 Review the Sales Order Control File 7.1.24, and set the following fields:

Detail Allocations: No

Company Address: (Distribution Site Address Code)

Sales Order Header Comments: No

Sales Order Line Comments: No

Line Format: Single

Sales Order Prefix: SO

Invoice Prefix: IV

Integrate with AR: Yes

Integrate SA: Yes

Confirmed Orders: Yes

Hold Orders Over Credit Limit: No

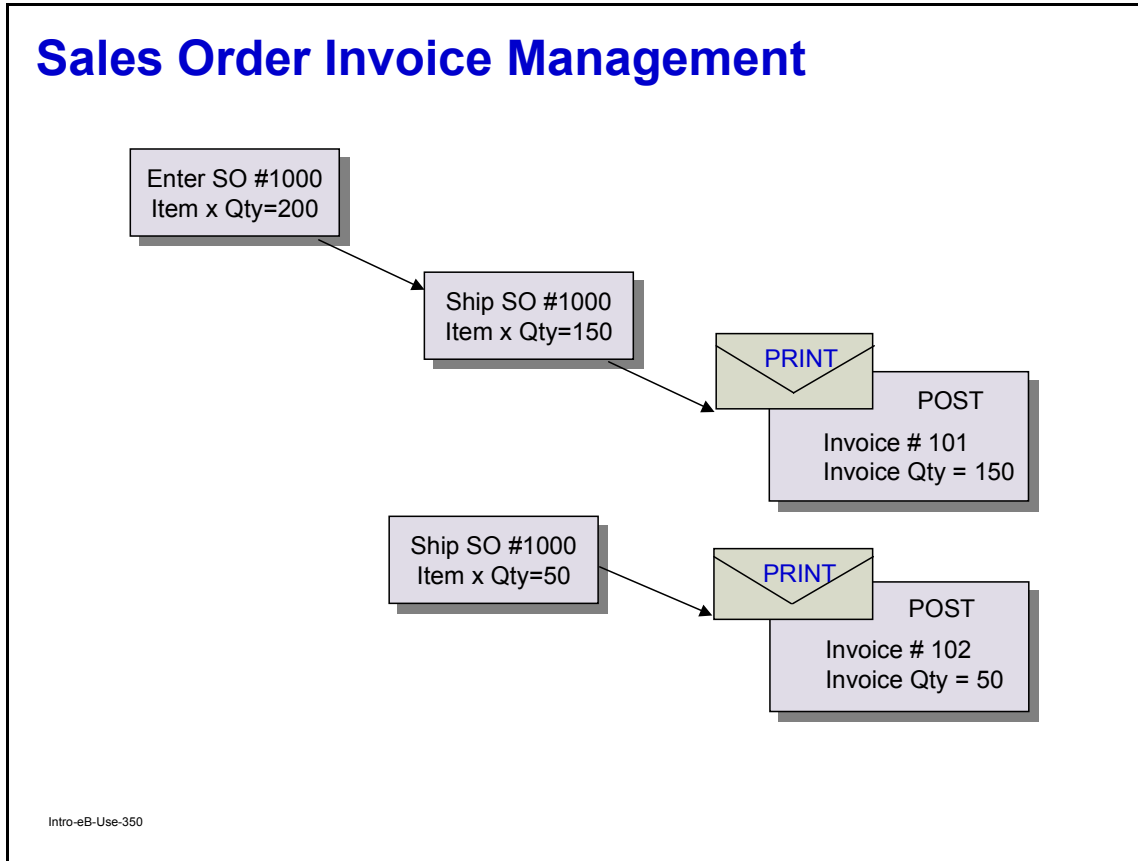
Add a Sales Order Record

- 1 Use Sales Order Maintenance 7.1.1 to add a sales order for your end item. Select any customer that was added earlier.
- 2 Reference the distribution site on the header. Let all other information default on the header from the control file and the customer address record.
- 3 Add a sales order line for the end item for 75 units. Make sure that the entire quantity is allocated on the order. Update and exit to the trailer.
- 4 Review the trailer detail and exit.

Print a Packing List and Ship the Sales Order

- 1 Use Sales Order Packing List 7.9.13 to print a packing list for your sales order.
- 2 Respond Yes to Update Quantity Picked? When you do this, the allocation status of this order is changed to Picked.

- 3** Select Sales Order Shipments 7.9.15 to record the shipment of the sales order. Ship Picked = Yes automatically updates the quantity to ship in the shipment display. You can then modify the quantity that is actually being shipped and the location from where the items were taken. Update and exit.
- 4** Review your inventory using Inventory Detail by Item Browse/Inquiry 3.2. You should see that the inventory has decreased by the amount of the shipment.
- 5** Review the inventory transaction in Transactions Detail Inquiry 3.21.1, and see which accounts were credited and which accounts were debited when you did the sales order shipment.



Sales Order Invoice Management

The shipping/invoicing cycle is relatively simple. When items are shipped on a sales order, the quantity to invoice is increased by the quantity shipped and the order is flagged as ready for invoicing. The next step is to print and post the invoice.

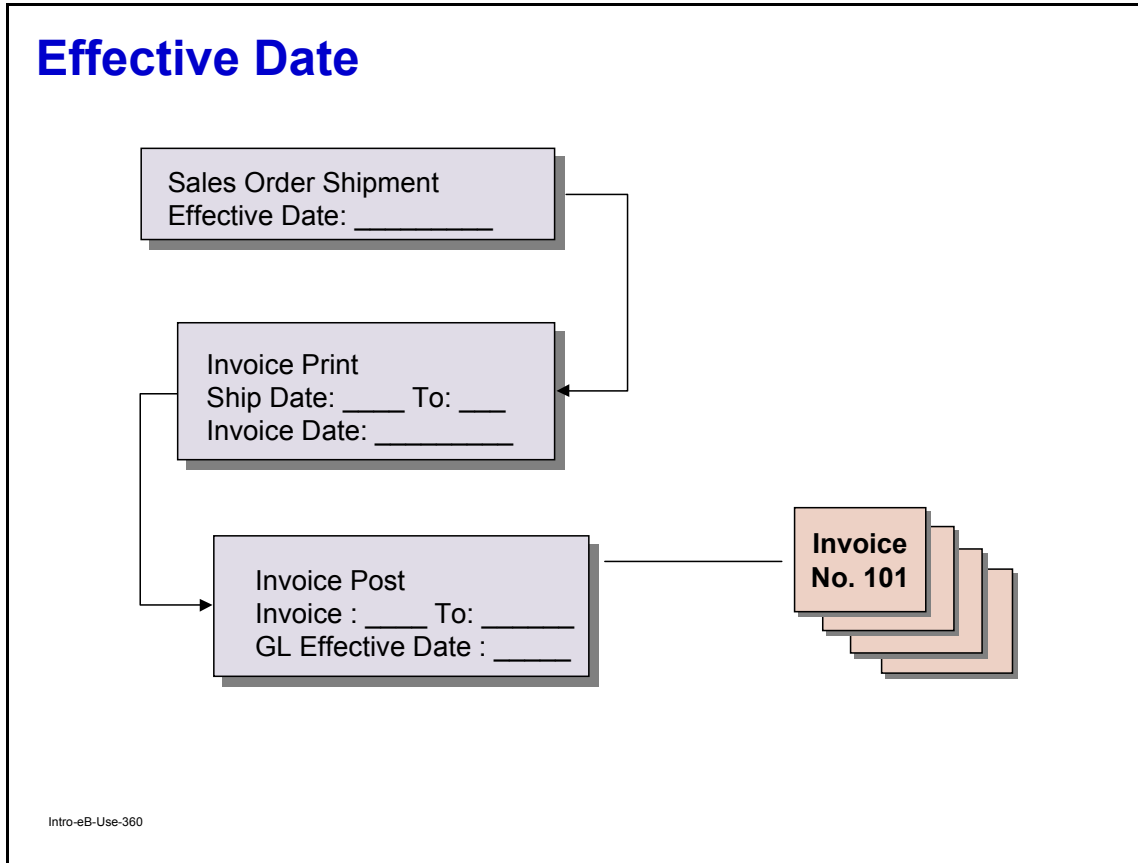
Consolidated invoices can be generated—that is, one invoice for all sales orders shipped to a particular customer.

It is possible to hold off invoicing until an order has been totally shipped. After processing each shipment, set the Ready To Invoice flag to No. Each additional shipment adds to the open quantity to invoice. Once the entire order has been shipped, you manually set the Ready To Invoice flag to Yes and print the invoice.

The implication here is that multiple invoices can be associated with each sales order. The invoice number is not equal to the order number.

Usually they are just assigned sequentially by the system. When the invoice is posted to AR, the AR Dr/Cr memo is identified by the invoice number and it maintains the original sales order number as well. The customer PO number is also passed to AR.

All three can be used to look up information in the AR module.



Effective Date

The other important consideration, particularly with sales functions, is what accounting period is to be affected. Throughout the system this is indicated by the transaction effective date. Effective dates can be entered on all inventory and accounting transactions.

This is the date when the GL transaction is to take effect, updating the GL balance for the specified accounts.

Note The effective date has no effect on the inventory balance update. Inventory balances are updated immediately.

Period End Shipments

For example, when you ship a sales order, you can specify an effective date. It defaults to the system date but can be changed manually to an earlier or later date, provided that date falls within an open GL calendar period. This is useful at period-end.

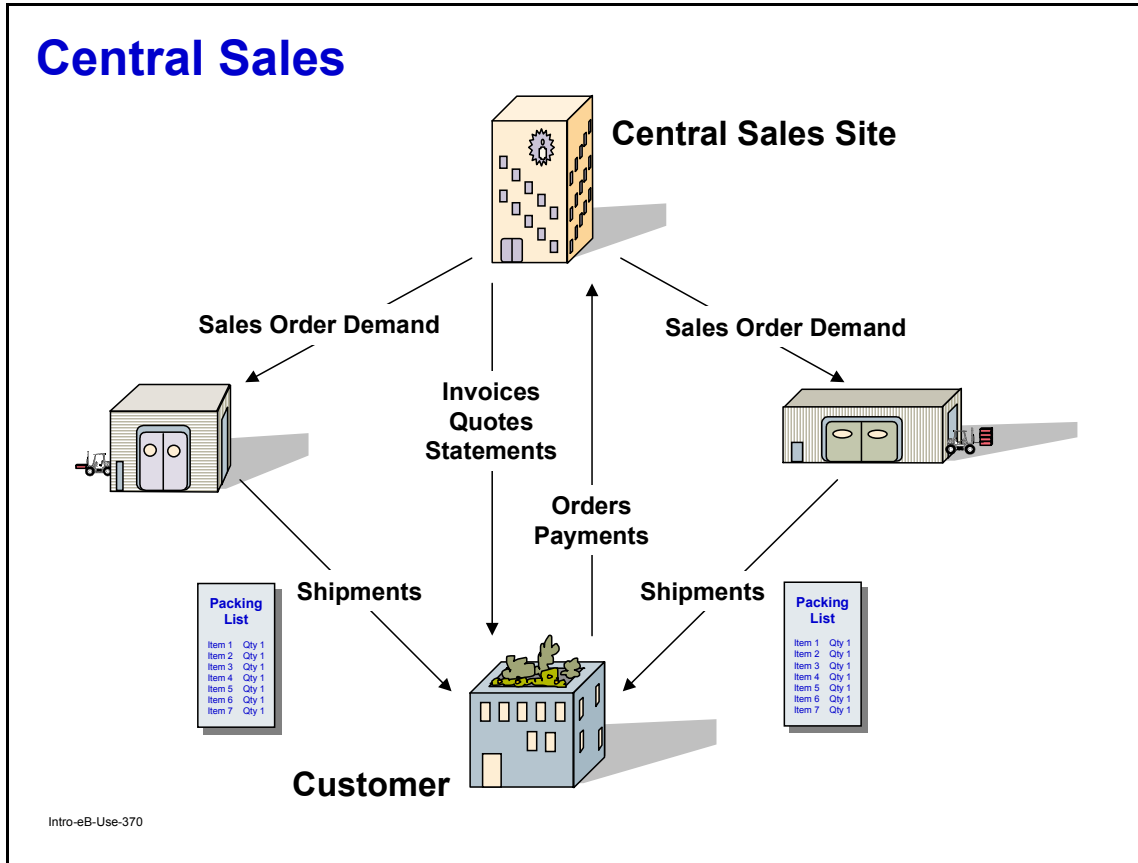
If the period ended on Friday, but you did not get a chance to enter all of Friday's shipments, you could enter the rest of the shipments Saturday, back-dating their effective date to Friday.

Invoice Date

When you do this, it is necessary to use that date for the rest of the shipping/invoicing process. Invoices are normally printed for a range of shipment effective dates, and an invoice date is specified. In our example, you would likely also set this date to Friday.

When the invoices are posted, a GL effective date is assigned. Once again, this defaults to the system date but can be changed manually. In our example, this date should also be changed to Friday's date.

This is important to ensure that all of your audit trails match. If the dates do not match, shipping and invoicing histories will not match your AR and GL audit reports.



Central Sales

Centralized sales order processing allows sales orders to be entered at one place designated as the central sales site. All accounts receivable processing is done at that site as well. Sales and AR programs are disabled at all other sites.

Central sales is an example of a distributed function—one that operates by network. Distributed functions access and update information in multiple databases.

In the central sales database, a sales order is entered. It may specify products to be shipped from one or more sites. The system then communicates shipping requirements to the designated shipping sites.

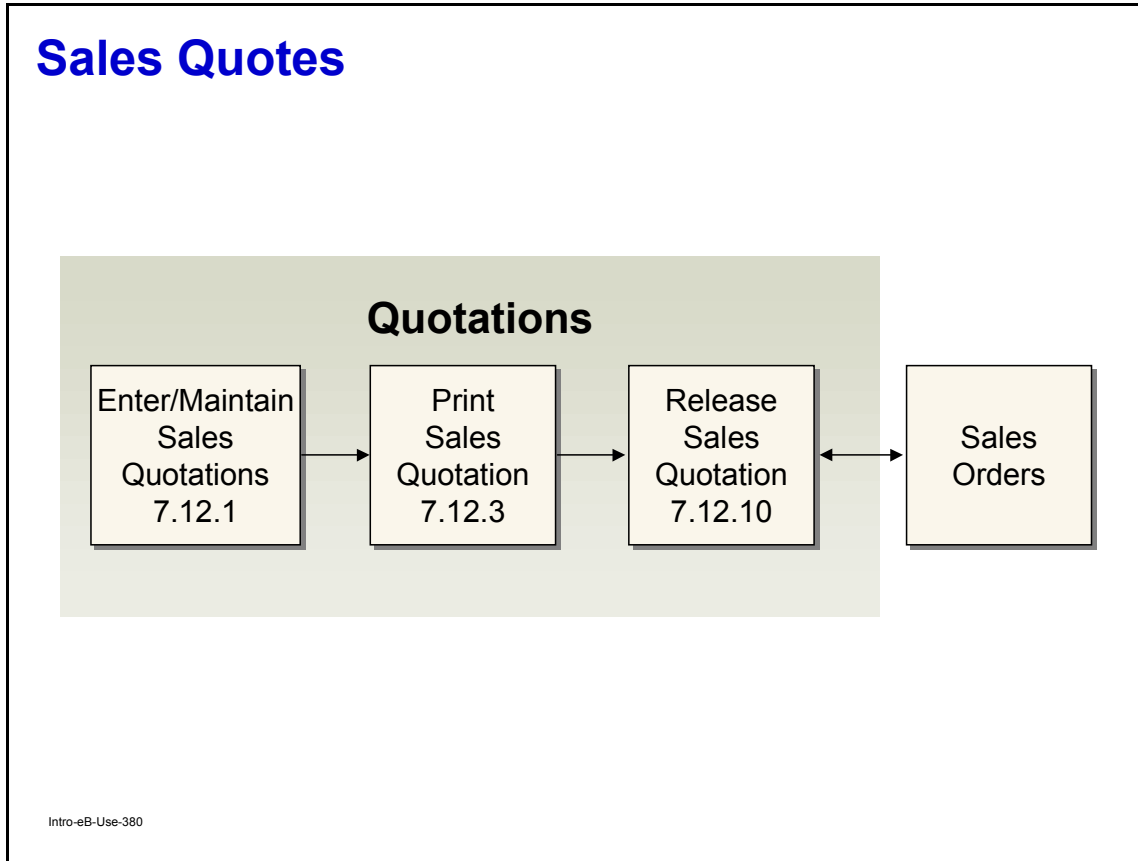
They may be in the same database or in one connected on the network. Each site is assigned to a database, and each database is defined in the Database Connection Maintenance file 36.6.1.

When you specify a shipping site on a sales order, the system places the sales order demand there. Once there, MRP sees the demand and local inventory is allocated.

Each shipping site prints a picklist and ships the products to the customer. The shipment is physically recorded in the central sales order database. This flags the order for invoicing and decreases inventory in the local shipping site's database.

The central sales database generates the invoice and manages all accounts receivable activities. The customer remits all payments to this central site.

If a database is not up or connected, you cannot enter confirmed orders or shipments for sites in that database. Sales order entry can continue, and orders can be confirmed later when the connection comes up.



Sales Quotes

No MRP—No Due Date

Quotes operate very differently than customer schedules; even though a quote could be used to plan future deliveries, it is not considered by MRP.

Quotes are merely an offer to provide a customer with a certain product, or group of products, at a certain price and according to some terms. Delivery date may or may not be specified.

Release

Once the customer accepts the quote, the quote becomes an order. This can be done automatically by releasing the quote to a sales order. You specify the quantity to release and the due date, and the quote information is passed to the resulting sales order.

Release Cycle

Multiple releases can be processed against a quote. Some quotes may be for a large quantity of a product to be delivered over a period of time.

The quote just promises a price based on this quantity commitment, but the customer could take this quantity in multiple shipments.

Often these shipments are regular, such as weekly or monthly. When this is the case, the quote can be set up to be released on that same frequency, indicated by a cycle code. Then each week, all of the weekly cycle codes can be released at one time.

Note Since most companies are happy to sell more than they quoted, the total quantity released can exceed the original quote quantity.

Lost Sales

Unfortunately, quotes do not always result in a sale. Those that do not can be assigned a reason lost code—price, delivery, quality. Lost sales can be reviewed by reason code.

Processing Activities



Intro-eB-Use-385

Processing Activities

In the following activity you:

- Review pending invoices and print an invoice for the shipment
- Post the invoice to Accounts Receivable

Review Pending Invoices and Print an Invoice for the Shipment

- 1** Use Pending Invoice Register 7.13.2 to review the pending invoices outstanding. This report will show you the invoices that have not yet been printed and posted. You can also change the flags to show you invoices that have printed but not yet posted.
- 2** Print an invoice for your sales order using Invoice Print 7.13.3. This is a hard copy document that is normally sent to your customer.

Post the Invoice to Accounts Receivable

- 1** Post the invoice using Invoice Post 7.13.4, updating the customer account balance, generating unposted GL transactions debiting sales, and updating sales and invoice history.
- 2** Use Customer Account Browse/Inquiry 27.13 to verify the customer's account balance.

This activity completes the entire basic process of managing your business with orders.

A simple business could run in this fashion without using planning systems.



Course Overview

- ✓ Introduction to MFG/PRO eB
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ◆ Set Up and Use MFG/PRO eB
 - Planning Systems
 - Advanced Processing
 - Accounting Systems

Intro-eB-Use-390

What's next?

To understand the impact of the various MFG/PRO eB processing systems, it is first necessary to understand the planning systems that they feed. The next chapter covers MFG/PRO eB planning systems.

CHAPTER 6

MFG/PRO eB Planning Systems





Planning Systems in MFG/PRO eB

In this section you learn how to:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ **Set Up and Use MFG/PRO eB**
 - ✓ **Planning Systems**
 - Advanced Processing
 - Accounting Systems

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Planning Systems

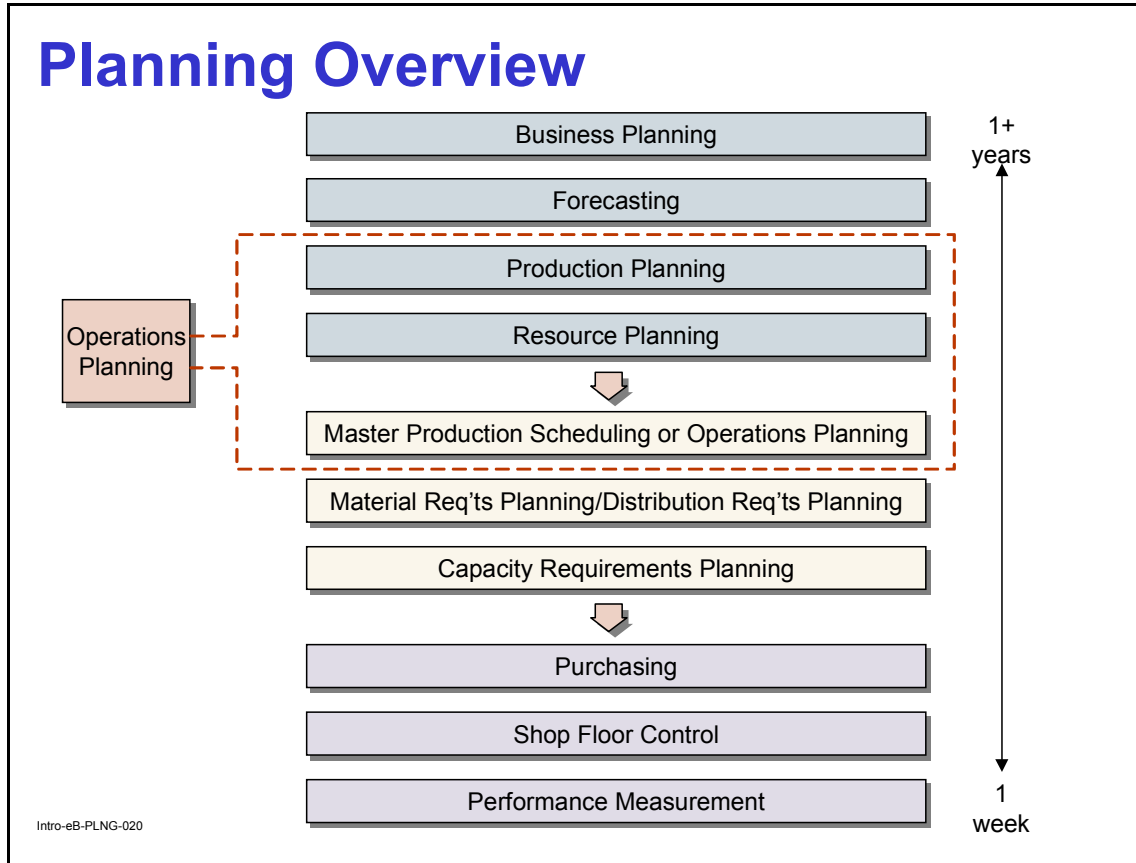
At the core of MFG/PRO eB are the planning systems, which provide high-level to detailed, operations-level plans.

In this chapter, we look first at the planning system as a whole, and then at each of the system components, including:

- Operations planning and enterprise resource planning (ERP)
- Product line planning
- Resource planning
- Forecasting
- Master schedule

- Rough-cut capacity planning (RCCP)
- Material requirements planning (MRP)
- Capacity requirements planning (CRP)
- Distribution requirements planning (DRP)

Note A basic understanding of planning and inventory control systems is assumed. This section concentrates on these functions as performed in MFG/PRO eB.



Planning Overview

Within a corporation, planning is done at many levels by many people. MFG/PRO eB provides an integrated set of planning tools that are useful at most of these levels. The primary components of the planning system are:

Production Planning

A central production planning tool can help facilitate the balance of supply and demand between sites in the supply chain. ERP is an information system for planning company-wide resources needed to take, make, ship, and account for customer orders.

Enterprise Resource Planning (ERP)

In companies that use ERP, operations planning is the key link between long-term business planning and medium- to short-term planning and execution activities.

ERP calculates target inventory levels that support company objectives for profitability, inventory and lead time reductions, customer service, and so on. ERP also calculates the corresponding production demands. These demands eventually pass into production, purchasing, and material requirements planning (MRP).

Product Line Planning

At the production level, product line planning balances sales forecasts, production forecasts, and income forecasts for an entire product line, while meeting the profit goals established in the strategic plan.

Product line planning is where plans created by different people are brought together.

Resource Planning

Resource planning is used to determine whether resources meet the plans.

End-item Planning

Once established, the product line plan is broken down into individual item forecasts. Actual and forecast demands are reviewed by the master scheduler. The master scheduler sets production levels in response to these demands.

Rough-cut Capacity Planning

Rough-cut capacity planning (RCCP) determines whether you have enough critical resources to meet the master schedule.

Component Planning

Material Requirements Planning (MRP) and Distribution Requirements Planning (DRP) calculate the quantity of raw materials and components needed to support the master schedule.

DRP generates planned orders for items to be transferred from another site. MRP generates planned orders for purchased and manufactured items.

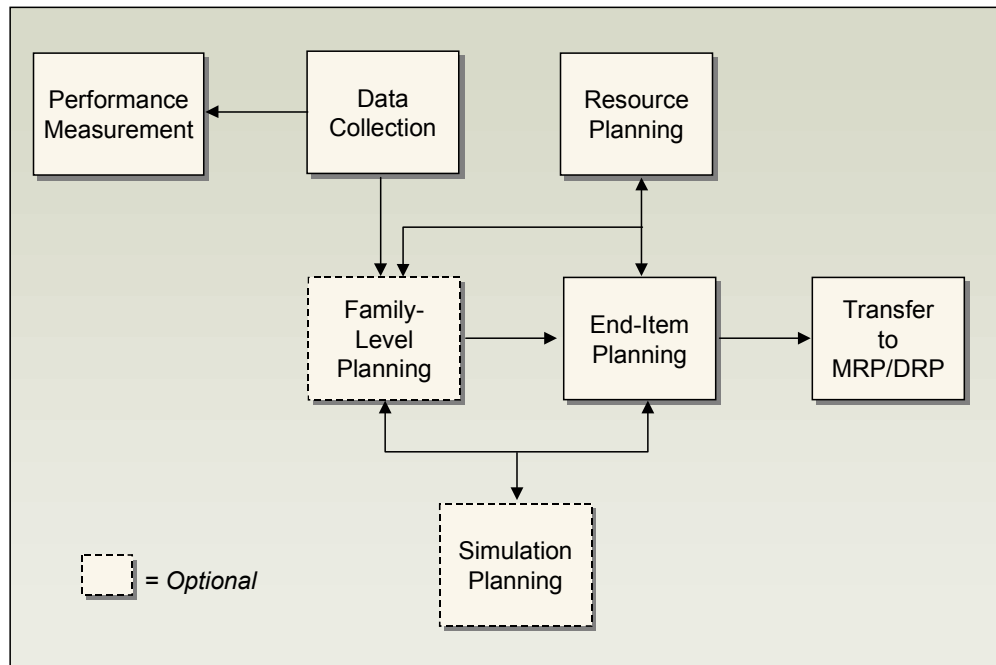
Capacity Requirements Planning (CRP)

CRP determines fairly precisely how this plan loads resources at your site.

Note The MFG/PRO eB Operations Plan module closely parallels the classic American Production and Inventory Control Society (APICS) model for sales and operations planning. However, it is superior in that it generates firm-planned work orders that can replace master schedule orders.

To prevent duplications, do not use the Forecast/Master Plan module for item-sites already included in operations planning.

Operations Planning Workflow



Intro-eB-PLNG-030

Operations Planning

To generate any plan or performance report, you must first collect item sales, inventory, and production data from company sites and databases. Operations planning activities do not affect the source transactions, only the collected data.

Family-level Planning

Family-level planning is optional but useful for limiting the number of items by brand name, target market, production process, and so on. To develop the family plan:

- 1 First generate site sales forecasts for each family item.
- 2 Then consolidate these forecasts and calculate the family plan.

You verify the production quantities against known capacity constraints and modify them if necessary. To experiment with planning scenarios, you can also create simulation plans.

Then, you explode the plan to calculate the corresponding dependent end-item demand. This step passes the family plan production requirements into the end-item planning cycle.

Operations Plan

Operations planning continues at the end-item level; the processing steps roughly parallel those at the family level.

To develop the end-item operations plan, first load and consolidate sales forecast and inventory data for all company sites. Then use this data to calculate the operations plan for each end item.

You verify the production quantities against known capacity constraints and modify them if necessary. You can also create simulation plans. If you plan at the family level, you must also roll the changes back into the family plan.

Production Demands

Production demands from the operations plan affect subsequent manufacturing, planning, and purchasing activities.

Once you are satisfied with the operations plan, you run an explosion process to generate firm planned orders. These orders function in much the same way as master schedule orders generated by the Forecast/Master Plan module.

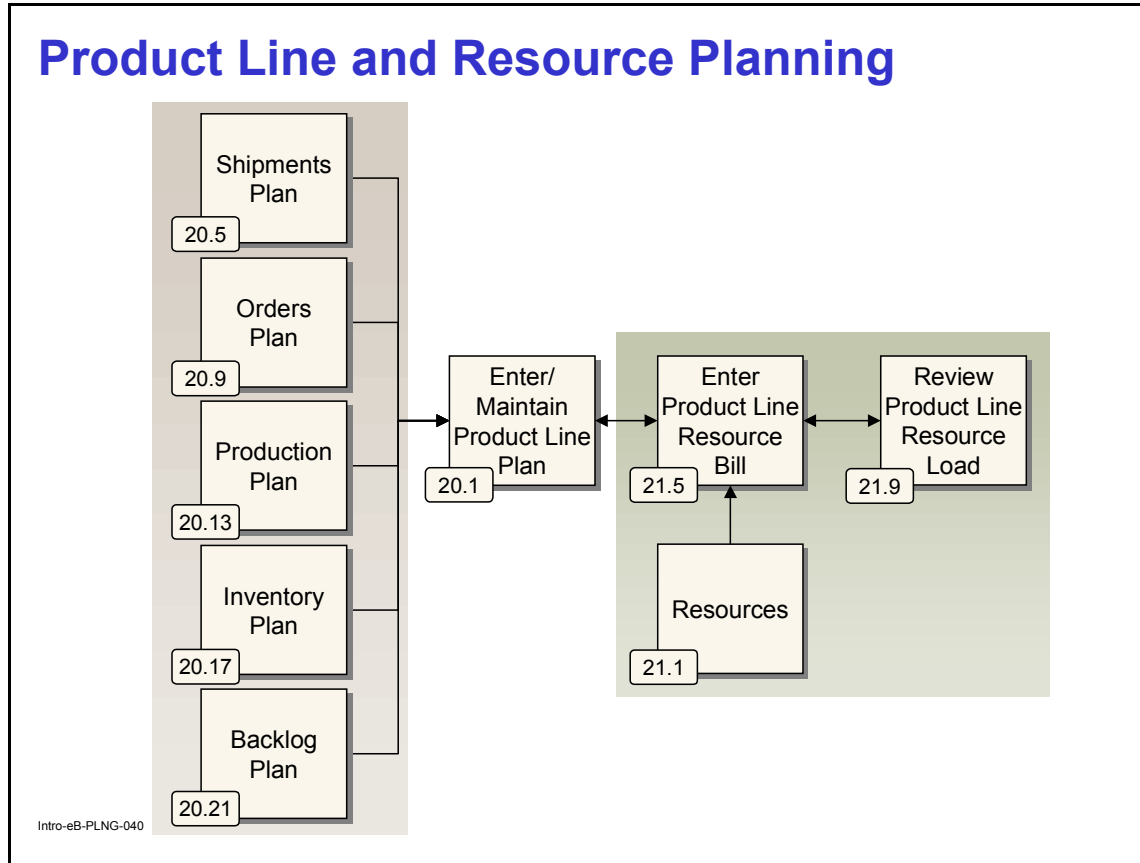
In fact, if you plan to use Operations Planning for master scheduling, do not use the Forecast/Master Plan module for the same item-site. You can approve the orders as firm-planned work orders, repetitive schedules, or purchase requisitions.

To ensure that MRP and sales forecast records remain synchronized, you also run a balancing utility. Finally, you run MRP/DRP to generate planned orders for component requirements.

Performance

At the end of the planning cycle, you measure actual vs planned sales, inventory, and production performance. To do this, you first load end-item data using the same data collection programs you used to load plan data.

If you plan at the family level, you also roll the actual end-item performance back up to the family level. Then, you print and review performance reports.



Product Line and Resource Planning

Conflicting Goals

Product line plans are usually done at a factory or site level by people responsible for achieving the goals set by top management for the next year.

They coordinate all activities at a site, reconciling the requirements of different groups. Sales, production, and income projections all come from different sources—and often conflict.

Enter Each Plan

Different plans coming from different sources can be entered in different places. Shipments and costs, for instance, can be entered in Shipments Plan Maintenance 20.5. Because no plan is much good unless it is later checked against reality, you can enter actuals in each plan and MFG/PRO eB calculates variances.

Balance Expectations

The goal of product line planning is to balance various sets of expectations. Individual plans can be aggregated in Product Line Plan Maintenance 20.1, where their interrelationships can be observed and adjusted.

The resulting product line plan provides guidance to those responsible for producing individual items that make up the product line.

Re-evaluate

The product line plan should not be static. As actual results are recorded (usually monthly and quarterly) and compared to planned, the overall plan is reevaluated. Where there are substantial discrepancies between planned and actual, numbers are modified and the overall plan is rechecked.

Key Resources

The planned product line production can be checked against the availability of constraining or key resources using resource planning. Key resources might include cash, overall plant capacity, or even the number of seats in the plant cafeteria. If the planned production is not achievable, then something in the product line plan must be modified.

Product Line Planning Calculations

Site:	10000	Product Line:	1000	HOME COOLER PRODUC	Year:	1996	
	Value in Thousands		USD				
	Ship Fcst	Ord Fcst	Backlog	Cost Fcst	Prod Fcst	Inv Fcst	GM %
			180.0			10.0	
January:	250.0	190.0	120.0	200.0	200.0	10.0	20.0
February:	250.0	200.0	70.0	200.0	200.0	10.0	20.0
March:	250.0	220.0	40.0	200.0	200.0	10.0	20.0
April:	250.0	230.0	20.0	200.0	200.0	10.0	20.0
May:	260.0	240.0	0.0	205.0	230.0	35.0	21.2
June:	260.0	260.0	0.0	205.0	230.0	60.0	21.2
July:	260.0	260.0	0.0	205.0	230.0	85.0	21.2
August:	270.0	270.0	0.0	210.0	230.0	105.0	22.2
September:	280.0	280.0	0.0	212.0	200.0	93.0	24.3
October:	290.0	290.0	0.0	215.0	200.0	78.0	25.9
November:	300.0	300.0	0.0	220.0	200.0	58.0	26.7
December:	300.0	300.0	0.0	220.0	200.0	38.0	26.7
Total:	3,220.0	3,040.0		2,492.0	2,520.0		22.6

Backlog Balance = Beginning Backlog – Ship Forecast + Order Forecast

Inventory Forecast Balance = Beginning Inventory Forecast – Cost Forecast + Production Forecast

Gross Margin Percent = (Cost Forecast ÷ Ship Forecast) – 1

Intro-EB-PLNG-050

Product Line Planning Calculations

Margin, Inventory, Backlog

Product Line Plan Maintenance 20.1 is where the various plans are brought into line with each other. To make sure that each plan is stated in the same terms, all plans are expressed in thousands of dollars (or base currency).

Each plan has been entered manually, since their numbers can come from a variety of sources, for example, financial reports or budgets. Certain key figures are then calculated from the plans.

Gross Margin

Gross margin, which is often dictated by a strategic plan, is calculated from the shipment forecast (the number of dollars actually shipped) and the cost forecast (the costs actually incurred).

The formula is $GM = (Shipments - Cost) / Shipments$.

Backlog

The backlog, which is an indicator of one's ability to meet orders, is calculated from the shipment forecast (often provided by production) and the order forecast (provided by sales).

The formula is $Backlog = Previous\ Backlog + Orders - Shipments$.

Inventory Turns

Inventory, another indicator of the plan's success, is calculated from the production forecast and the cost (which is treated as the Cost of Goods Sold). More specifically, $Inventory = Previous\ Inventory + Production\ Forecast - Cost\ Forecast$. To calculate inventory turns, take average inventory and divide it by the total cost. What would the inventory turns be for the screen above?

Production Loads Capacity

The key figure in determining whether the organization has enough resources to meet the schedule is the production forecast. This figure shows what the organization plans to make, which cannot be achieved if there is not enough capacity.

Resource Planning

21.1– Resource Maintenance

Reference	Start	End Date	Cap/Day
Normal			60.0

21.5 – PL Resource Bill Maintenance

Intro-eB-PLNG-060

Resource Planning

Plans are useless without the necessary resources. Resource Planning functions verify that product line plans are realistic. Product line planning is also important in other capacity planning functions such as resource capacity, load, quantity per, and offset.

Resource Capacity

You only need to check the availability of key resources—cash, critical machines, floor space, skilled labor, and so on. First, determine how much of this resource you have on any particular day. The resource capacity can be entered in Resource Maintenance 21.1.

PL Resource Bill

Next, determine how much load each \$1,000 unit of the production plan places on each resource. In PL Resource Bill Maintenance 21.5, say how much (Quantity Per) of the key resource it takes to make \$1,000 worth of a given product line.

Start/stop dates can be used to add requirements at particular periods. PL Resources will only show up as load if LT is set to 1.

LT Offset

Resource requirements can come before or after production. Consider cash—it may take a \$400 investment to generate \$1,000 worth of production. Lead Time (LT) Offset indicates whether requirements come before or after production.

Load and Capacity

Resource load is calculated by multiplying the production forecast from the product line plan by the resource requirements. The capacity, projected load, and under-load or overload are shown in the PL Resource Load Summary Inquiry 21.9.

The over/under is calculated as $\text{Load (Production Forecast} \times \text{Qty Per)} - \text{Capacity (Workdays} \times \text{Resource/Day)}$.

Planning Activities



Intro-eB-PLNG-065

Planning Activities (optional)

In the following activities you see if you have enough of a resource at your plant to meet your production plan. The production plan is based on the aggregate product line, not the parent item alone. In your business simulation so far, you have only one parent item in your product line, so you can calculate the product line plan based on the cost and run time of the parent item for this activity.

In this activity you:

- Calculate the labor hours you have available per day
- Calculate the labor hours required to make \$1,000 worth of product
- Calculate a reasonable production plan based on the labor hours available per day

Calculate Labor Hours Available Per Day

- 1** Check Work Center Maintenance 14.5 to find out the number of machines you have in your work center.
- 2** Check the number of hours you work per day (average if necessary) in Calendar Maintenance 36.2.5.
- 3** Multiply the number of machines you have by the number of hours you work per day to calculate the capacity per day for your labor resource.
- 4** Use Resource Maintenance 21.1 to enter the amount of labor resource you have:

Resource: Labor

UM: HR

Reference: Normal

Cap/Day: (Calculation from step 3)

- 5** Update and Exit.

Calculate Labor Hours Required for \$1,000 Worth of Product

- 1** Look at Item-Site Cost Inquiry 1.4.10 to find the total GL cost to make your parent item.
- 2** Divide \$1,000 by the total cost of your item. This is the number of units you can make with \$1,000.
- 3** Check how much time you need to make one unit of your item in Item-Site Planning Inquiry 1.4.8. (Check the Run Time field.)
- 4** The number of units you can make with \$1000 (Step 2) multiplied by the number of hours you need to make one unit (Step 3) equals the labor hours required to make \$1,000 worth of product.

- 5** Enter the amount of the Labor resource your product line uses per \$1,000 worth of product in PL Resource Bill Maintenance 21.5:

Product Line: (The product line of your parent item)

Site: Your Manufacturing Site

Resource: Labor

Quantity Per: (Your calculation from step 4)

Lead Time: 1

- 6** Update and exit.

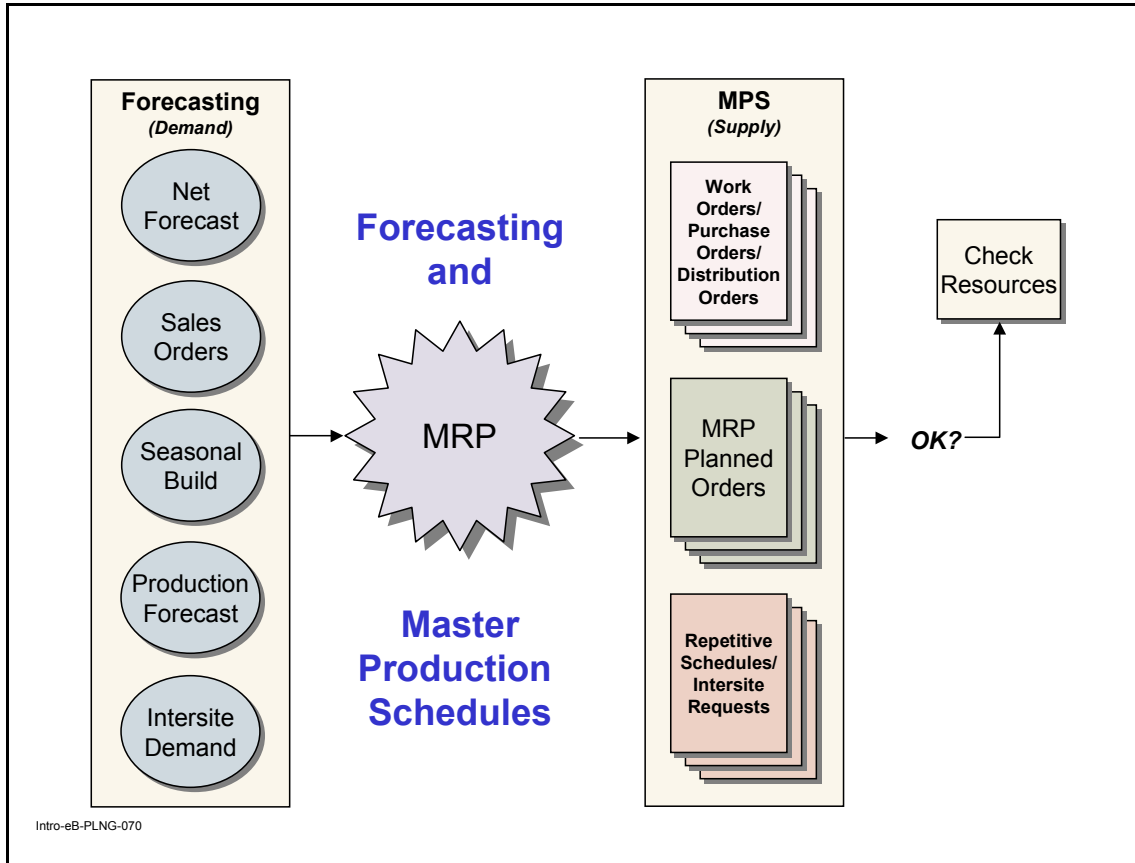
Calculate Production Plan Based on Labor Hours Available Per Day

- 1** One way to do this is to multiply the number of machines by the number of shop hours in a day by the number of days in the month.
 - a** Assuming you have a five-day work week, use 20 days per month.
 - b** Divide this by the run time of your parent item.
 - c** Round the number to the nearest 1,000.
- 2** Multiply the number of units by the cost of the item. This is the cost in dollars.
- 3** Use Production Plan Maintenance 20.13 to update your production forecast (prod fctst) for the next year starting with this month. Remember to state this in thousands of U.S. Dollars.
- 4** Update and exit.
- 5** Use PL Resource Load Summary Inquiry 21.9 to check if your capacity and load are balanced for your labor resource. If plans are not reasonably balanced, you can adjust your plan by doing one of the following:
 - a** Adjust capacity

Increase or decrease amount of labor available in Resource Maintenance 21.1
 - b** Adjust load

Change amount of labor needed in PL Resource Bill Maintenance 21.5

Change production forecast in Production Plan Maintenance 20.13



End-Item Planning

End-item planning starts with the master schedulers, who estimate the demand for a product and determine how many to produce. Usually their planning horizon is at least the cumulative lead time.

Input

- Forecast item quantity by week
 - The primary input to the master scheduling process are actual and forecast demands
Forecast demands are derived from the product line plans but are much more detailed.
 - Forecasts are expressed in terms of quantities for a specific item and site by week

Unlike product line plans, which express forecasts in terms of thousands of dollars of production for a complete line of items by month.

Seasonality

Products subject to seasonal demand can have forecasts that fluctuate widely from week to week. Seasonal build schedules are used to smooth these requirements by increasing production in advance of anticipated spikes in demand.

Output

The output of the master scheduling process is a detailed plan of the number of end items and the schedule for their production.

The check on this plan is the availability of critical resources. If you want to make 50 items next week, but your fabricator only makes 25 in a week, you cannot fulfill the plan. Detailed resource planning is done at this stage by looking at the actual schedule and its demands on resources as specified in Item Resource Bill Maintenance 21.17. In many cases, only bottleneck resources are reviewed.

22.2 – Forecast Worksheet Maintenance

Forecast Worksheet Maintenance

User Menu Edit Queue Options Help

Item Number: 10-10000 Site: 10000 Year: 2001
OASIS(TM) COOLING SYSTEM HOME/INDUST MOD

Week	Forecast	Sales	Abnormal	Prod Fcst	Net Fcst
1 01/01/01	120	50	0	0	70
2 01/08/01	120	125	0	0	0
3 01/15/01	120	95	0	0	20
4 01/22/01	120	15	0	0	105
5 01/29/01	120	0	0	0	120
6 02/05/01	140	0	0	0	140
7 02/12/01	140	0	0	0	140
8 02/19/01	140	0	0	0	140
9 02/26/01	140	0	0	0	140
10 03/05/01	150	0	0	0	150
11 03/12/01	150	0	0	0	150
12 03/19/01	150	0	0	0	150
13 03/26/01	150	0	0	0	150
Totals	1,760	285	0	0	1,475

F1=Help F2=Go ESC=End F5=Delete Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-PLNG-080

Forecast Worksheet Maintenance

Menu Number 22.2

Forecast by Week

The forecast is an estimate of future demand for an item at a particular site, stated in terms of quantity per week. This is the starting point for developing an executable plan. In MFG/PRO eB, this is a shipment forecast or the quantity of an item to be shipped (not ordered) that week.

Forecasts are normally entered for items subject to independent demand, from sales orders or spares. Dependent demand for components and raw materials is calculated from this.

Forecast Simulation

The shipping forecast that is entered in Forecast Maintenance 22.1 can be created manually or can be created using the Forecast Simulation module.

The Forecast Simulation module enables you to calculate the forecast from your historical sales data and project your future shipments based on rules that you manipulate. Forecast simulation recognizes the underlying patterns of demand:

- Trends
- Seasonal patterns
- Cyclical patterns
- Horizontal patterns

The forecast calculated in the simulation can be manipulated and converted into the forecast that drives MRP.

Total Sales and Abnormal

The system keeps a running total of the actual quantity to be shipped each week, determined by the due date on the sales order line item or customer schedule. Actual order quantities can appear in the column Sales or Abnormal. Both are sales orders, but the second represents orders not anticipated by the forecast developers. These can be major new accounts or windfall orders (for example, orders for roofing materials after a hurricane). These abnormal sales have no effect on the sales anticipated by the forecast.

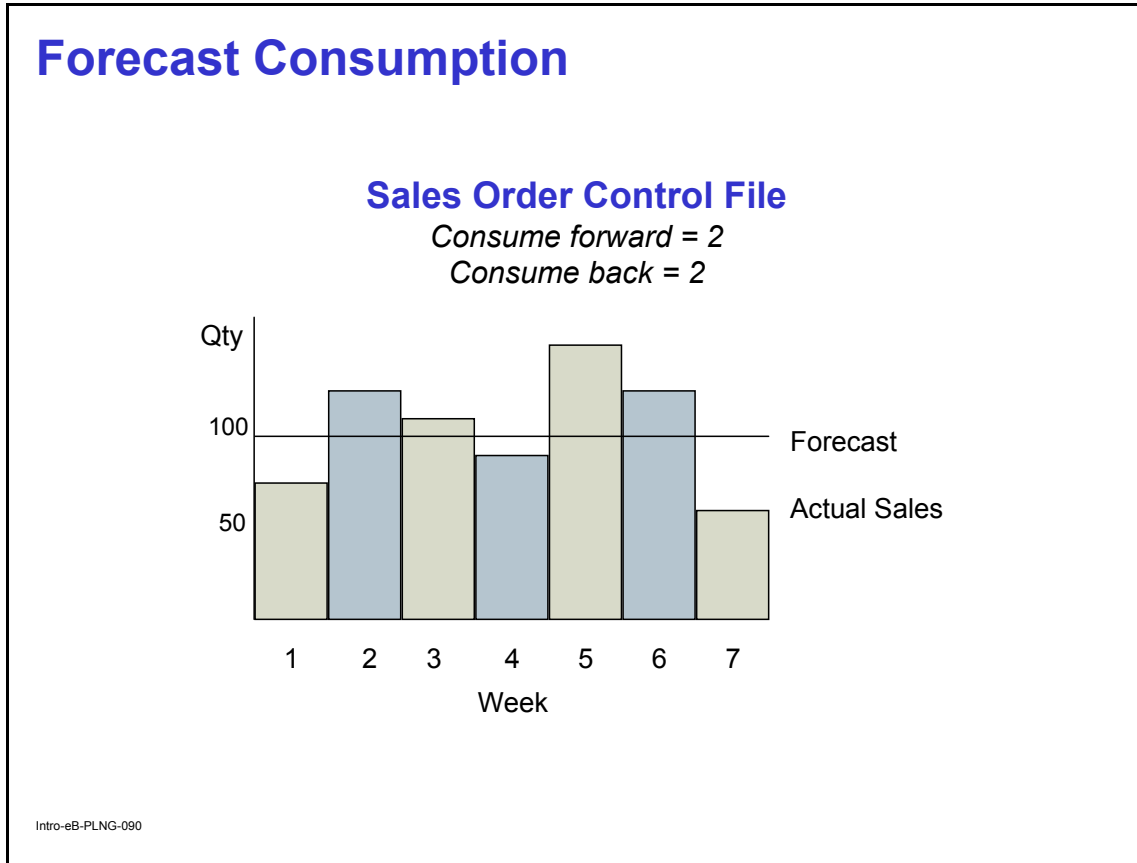
Plan Orders and Net Forecast

The system also tracks net forecast. This is the amount of the forecast not sold in any given week. MRP always plans to make enough product to match actual orders (regular sales and abnormal), but it also plans production to satisfy any remaining forecast because orders for this amount may still be expected.

Production Forecast

The other column you will notice is Production Forecast. This is calculated by the system based on the forecast of sales of another product (sales of disk drives based on the forecast of sales of computers, for example). These are also planned for by MRP.

Production forecast calculations are discussed later with multi-level master scheduling.



Forecast Consumption

Netting Process

Incoming sales orders and scheduled customer deliveries are netted against the forecast. The net forecast quantity is calculated as the original forecast less quantity sold (except abnormal sales). Planning sees total demand as actual sales (normal and abnormal), net forecast, and production forecast.

Lumpy Demand

- What if you forecast shipments of 100 units/week but get orders for 70 in week one, 125 in week two, and 105 in week three?
- Should you build a total of 300 units or 330?
- Do you expect to get orders for 30 more units in week one?

Accurate Over Longer Term

Forecasts are more accurate in the long term than in the short term. Actual sales seldom correspond to a forecast entered for a single one-week period. Sales can be predicted with more accuracy over a month or quarter. This can be managed by expanding the forecast window using backward and forward consumption.

Backward/Forward Consumption

If you do not use backward or forward consumption, when sales exceed forecast in a given week, you overproduce in that week to meet the demand.

In the above example, you make 125 units in week 2. But, if you specify backward or forward consumption, the system first consumes the forecast in the current week.

Then, to meet excess demand in that week, it consumes any unconsumed forecast from the prior and following periods.

In our example, the excess sales of 25 units would simply consume the unused forecast from week one.

Excess sales are recognized and planned for when the forecasts in the forecast window are consumed. This window is defined in the Sales Order Control File 7.1.24. Consume Back and Consume Forward can each be set to any number of weeks.

Seasonal Build

22.9 – Seasonal Build Maintenance

Site: 10000 San Diego Main Plant

Item Number: 10-10000 OASIS(TM) COOLING SY: HOME/INDUST MODEL

Date: 01/12/01

Reference: Spring

Seasonal Inventory: 100.0 UM: EA

22.10 – Seasonal Build Browse

Seasonal Build Browse (1-)

Item Number: 10-10000

Item Number	Site	Date	Reference	Seasonal Inventory	UM	Description
10-10000	10000	04/01/96	summer	25.0	EA	ER OASIS(?)
10-10000	10000	05/01/96	summer	50.0	EA	ER OASIS(?)
10-10000	10000	06/03/96	Summer	100.0	EA	ER OASIS(?)
10-10000	10000	07/01/96	summer	150.0	EA	ER OASIS(?)
10-10000	10000	08/01/96	summer	200.0	EA	ER OASIS(?)
10-10000	10000	09/01/96	summer	0.0	EA	ER OASIS(?)

Intro-eB-PLNG-100

Seasonal Build

Fluctuating Demand

Products subject to seasonal demand can have forecasts that fluctuate widely from week to week. Unfortunately, production capacity is usually fixed. You probably do not want to hire workers one week and lay them off the next; but, if the master scheduler developed the plan directly from the forecast, that could be what you would have to do.

Alternatively, the master scheduler can level out production, taking capacity into consideration by producing ahead of the forecast requirements. This is done by entering master schedule orders, that is, firm-planned manufacturing orders that specify detailed production quantities and due dates.

But, as you will see, MRP recommends that you cancel or de-expedite production that is not yet needed. If master schedulers enter many orders to produce products ahead of time, they will end up with a matching group of de-expedite messages from MRP.

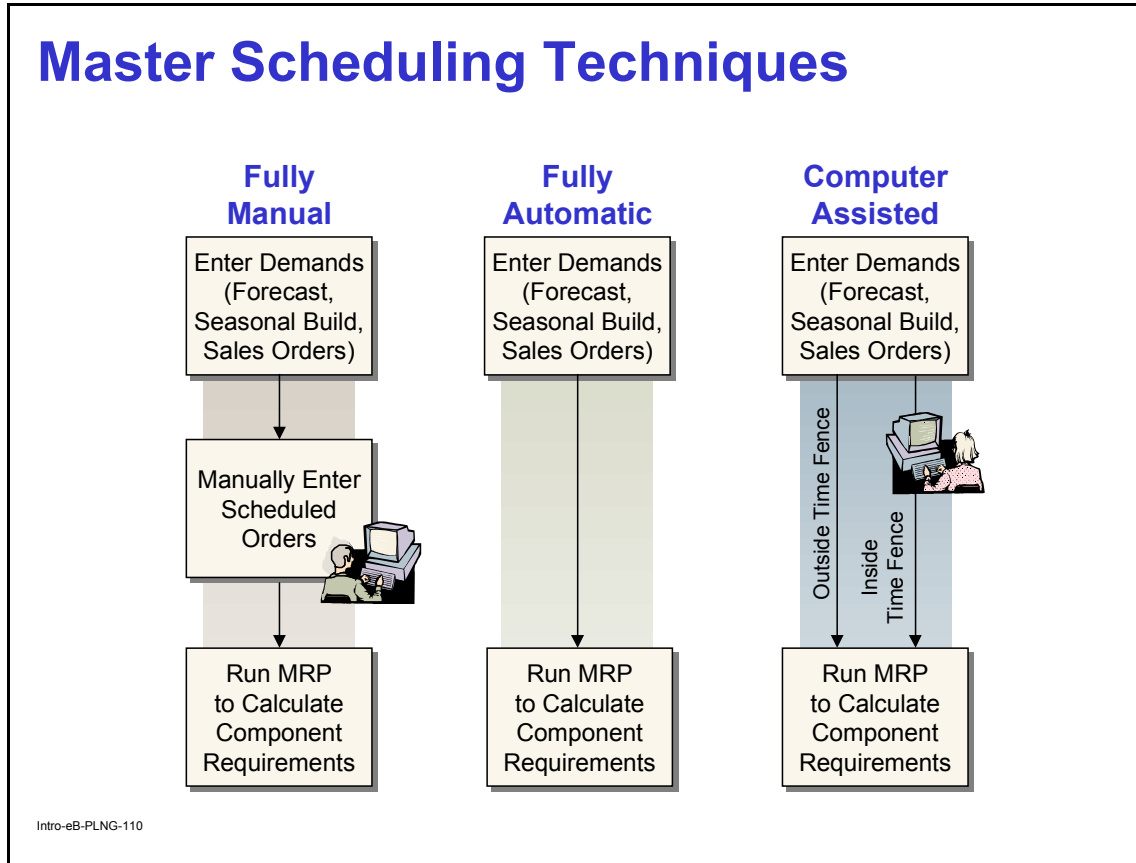
Demand for MRP

What we need is some way to tell MRP there really is a demand out there. That is done using seasonal build schedules. These enable you to build up inventory in anticipation of a future spike in demand.

Seasonal Build

Seasonal build schedules specify the quantity you want to have in inventory as of a given date. Some refer to this as time-phased safety stock. As this quantity increases, MRP plans it as a demand (much like planning for safety stock). But, when this quantity decreases, MRP plans it as a supply.

Usually, decreasing inventory buildup corresponds with increasing forecasted shipments—the built-up inventory starts to get shipped out. In MFG/PRO eB, this means that the seasonal build quantity appears in Available to Promise (ATP).



Master Scheduling

The Master Schedule is the key plan that drives the factory floor and identifies component requirements. It is a detailed statement of production—item, quantity, and due date.

The Master Schedule is a group of manufacturing orders. These can be entered manually as firm-planned orders or as a repetitive schedule, or generated by entering a forecast and running MRP to generate planned orders.

Different techniques can be used to develop the Master Schedule:

Fully Manual

The Master Scheduler reviews all sources of demand and enters all scheduled orders manually.

If Master Schedule items are set up as Plan Orders = No, MRP does not generate planned orders for Master Schedule items; it just displays create messages indicating that the Master Scheduler needs to create an order.

Fully Automatic

MRP reviews all sources of demand and generates planned orders for any items having demand.

The only thing the Master Scheduler does is approve or delete planned orders. Generally, anticipated demand is entered through the forecast.

Computer-assisted

This is a combination of the two methods above, combining the best of the two. It provides full manual control within a specified time horizon, but generates the plan automatically outside of that horizon.

The item time fence defines the horizon for each item.

22.18 – Master Schedule Summary Inquiry

Master Schedule Summary Inquiry								
User Menu Edit Queue Options Help								
Item Number: 10-10000 ORSIS(TM) COOLING SYSTEM MRP Req: yes Site: 10000 Mfg LT: 0 Plan Orders: yes Pur/Mfg: C QOH: 0.0 ER Pur LT: 0 Order Qty: 0 Min Ord: 0 Order Policy: POQ Safety Stk: 0 Yield%: 100.00% Max Ord: 0 Order Period: 7 Safety Time: 0 Time Fence: 0 Ord Mult: 0								
Past 01/08/01 01/15/01 01/22/01 01/29/01 02/05/01 02/12/01 01/07/01 01/14/01 01/21/01 01/28/01 02/04/01 02/11/01 02/18/01								
Prod Ecst	0	0	0	0	0	0	0	0
Forecast	0	70	0	20	105	120	140	
Sales Orders	0	50	125	95	15	0	0	
Gross Regs	0	0	0	0	0	0	0	
Master Sched	0	120	125	115	120	120	140	
Projected QOH	0	0	0	0	0	0	0	
Avail Promise	0	70	0	20	105	120	140	
Seasonal Build	0	0	0	0	0	0	0	

Available to Promise = Real Supply – Real Demand

Intro-eB-PLNG-120

Master Schedule Summary Inquiry

Menu Number 22.18

One of the primary displays used by the master scheduler and others is the Master Schedule Summary Inquiry. It provides a concise picture of all relevant information for an item at a given site.

On this display, the top frame shows item planning and inventory information, while the bottom frame shows supply and demand information summarized in whatever buckets you request—daily, weekly, or monthly—with any number of periods per bucket, and as little as one day per bucket.

Refer to Master Schedule Detail Inquiry 22.21 for supporting details.

ATP = Real Supply Minus Real Demand

Of all the information on this screen, ATP is the most important. It provides a powerful tool for order promising.

The system calculates it by taking the real supply—quantity on hand, purchase orders, work orders, and repetitive schedules—and subtracting the real demand—gross requirements and confirmed sales orders. (Seasonal build can be supply or demand.)

Planning Activities



Intro-eB-PLNG-125

Planning Activities

In the following activity you:

- Enter a forecast for the parent item
- Run MRP to calculate a master schedule for the parent item

Enter a Forecast for Parent Item

- 1** Use Forecast Worksheet Maintenance 22.2 to enter a forecast for your parent item at the manufacturing site for the next four weeks.
- 2** Review the Master Schedule Summary Inquiry 22.18 for your item at your manufacturing site. The display screen has two sections. In the top section, locate the following fields and record the following values:

Beginning on-hand balance: _____

MRP required flag: Yes/No

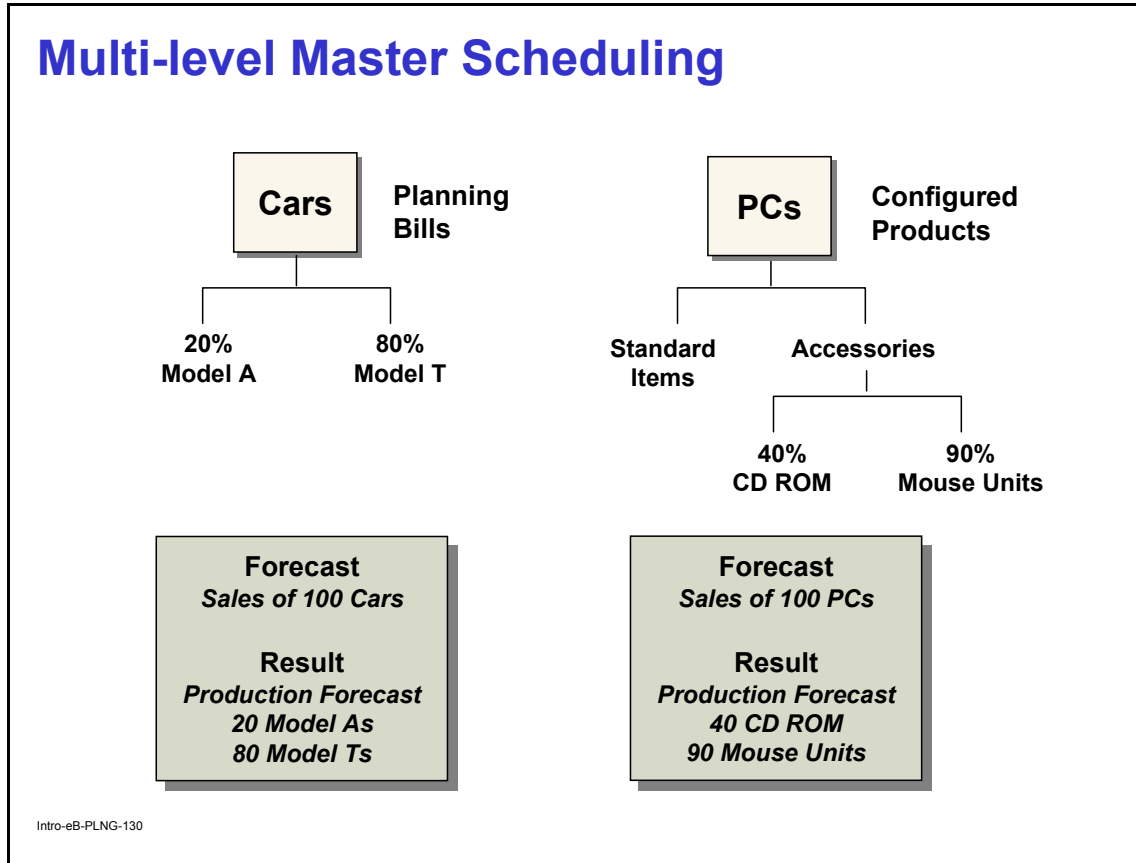
Plan orders flag: Yes/No

Order policy flag: _____

- 3** Review the second frame of the Master Schedule Summary Inquiry 22.18 and note that an out-of-balance condition exists between the demand and the master schedule.

Run MRP to Calculate a Master Schedule for Parent Item

- 1** Run Regenerate Materials Plan 23.2 for your manufacturing site.
- 2** Review the Master Schedule Summary Inquiry 22.18 for your item at your manufacturing site—the master schedule meets the forecast demand of your parent item.
- 3** Review the Master Schedule Detail Inquiry 22.21. What information does it provide that the Master Schedule Summary Inquiry 22.18 did not provide?



Multi-level Master Scheduling

Forecast at Higher Level

So far we have assumed that the scheduling process starts with an end-item forecast entered into Forecast Maintenance 22.1. But sometimes it is easier to forecast in aggregate, by brand or product group, rather than by item.

A company may forecast sales of 100 cars a week but be unsure of what models will be sold. They set up a planning item for Cars and forecast the planning item rather than each individual model.

Planning Bills (Structure Code P)

Each of the individual items in this product group is associated with the planning item by way of a planning bill. The planning bill is a product structure in which each of the components are set up with Structure Code P and a forecast percentage. When MRP runs, it generates a production forecast for planning bill components—in our case, Model T and Model A cars.

Forecast Consumption

Sales orders are entered at the lower level, but consume the upper-level forecast.

If I sell 40 Model As, the net forecast for Cars is 60. The next time MRP runs, it regenerates production forecasts—now 12 Model As and 48 Model Ts.

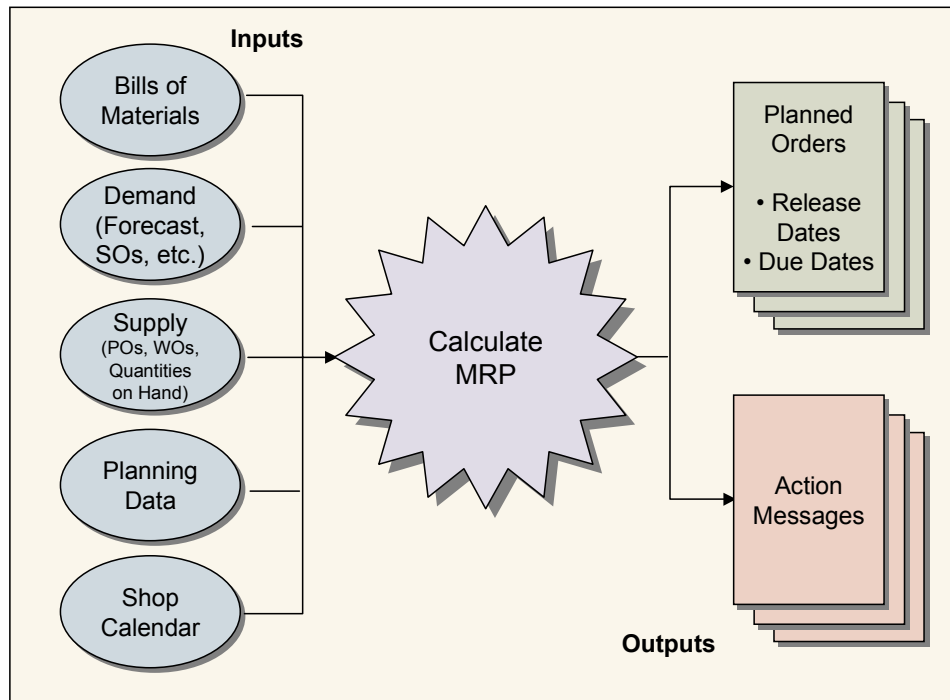
The production forecast always reflects the forecast percentages reflected in the planning bill, regardless of the actual sales mix.

Configured Products

Product options and accessories can be forecast in the same way, except that the product structure identifies these as Structure Code O, for option, and independent sales of these options will not consume the forecast for the upper-level item.

Because these items can be sold as part of a configuration or separately, they can have both a production forecast and an independent demand forecast.

Material Requirements Planning



Intro-eB-PLNG-140

Component Item Planning

Explode Component Demand

The Master Schedule is a detailed schedule of production, but production can be achieved only if the component materials are available.

MRP (and DRP) explode the Master Schedule to calculate the demand for components based on the bill of materials (BOM). These components may be purchased, manufactured, or acquired internally from another site.

We cover purchased and manufactured items first, and return to DRP items later.

MRP input includes:

MRP input includes:

Sources of Demand

- Forecast
- Production forecast
- Sales orders
- Gross requirements
- Seasonal build
- Safety stock

Sources of supply

- Nettable quantity on hand
- Purchase orders
- Work orders
- Repetitive schedules
- Quality orders

Item Planning Data**Product Structures and Formulas****Shop Calendar****Planned Orders Action Messages**

The primary output of MRP are planned orders and action messages.

Within the time fence, you just get action messages. Planned orders are generated outside of the item's time fence.

Usually, the planner reviews and approves MRP-planned orders as either work orders, repetitive schedules or requisitions.

Run Statistics

Print the MRP report for statistical information such as item quantities and run time.

Item and Item-Site Planning Data

1.4.7 – Item Planning Maintenance

Site Specific Planning Data

- ♦ Pur/Mfg Code
- ♦ Order Policy
- ♦ Lead Times
- ♦ Order Modifiers

Intro-eB-PLNG-150

1.4.17 – Item-Site Planning Maintenance

Item and Item-Site Planning Data

Item Planning Maintenance

Menu Number 1.4.7

Item-Site Planning Maintenance

Menu Number 1.4.17

Independent vs Dependent

Item-site planning information determines how each item is planned. Independent demand items are usually planned by a Master Scheduler, while dependent demand items are planned by MRP or according to a reorder point policy.

Order Policies

Order policy determines the number and size of each MRP-planned order. These can be:

- FOQ (Fixed Order Quantity)
 - Generates planned orders equal to the order quantity
- POQ (Period Order Quantity)
 - Generates planned orders to cover demands during the specified order period
 - Seven days is the default period for POQ
- LFL (Lot for Lot)
 - Generates a planned order to satisfy each demand
- OTO (One Time Only)
 - Used for prototype items that MRP orders once and only once
 - Prevents MRP from generating replenishment orders for items not in regular use
- Blank
 - Ignored by MRP
- Any other value is treated as Lot for Lot (LFL)

Order Modifiers

For all but FOQ, order quantity can be adjusted to reflect yield, order minimum, and order multiple. A message displays to flag orders generated for more than order maximum.

Lead Time

Lead times determine when the orders are due:

- Mfg LT for manufactured items
- Purchasing LT plus Inspection LT for purchased items

Safety lead time can be added to both. DRP items get their lead time from the DRP source network.

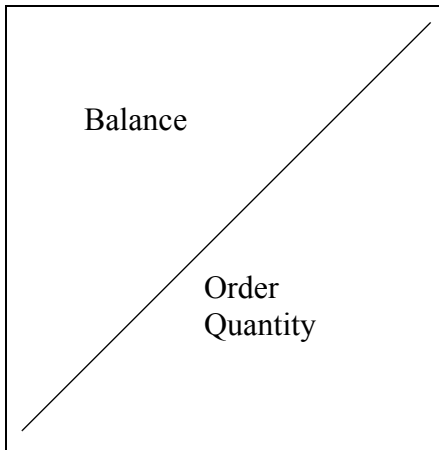
Planning Activities



Intro-eB-PLNG-155

Planning Activities

Instructions: Use the accompanying table to determine in which periods orders are required and for what quantities. Assume there is no on-hand inventory. Use the two sections of each box to keep track of the balance and order quantity values you need. For example:



Order Policy and Modifier Activity

Period	1	2	3	4	5	6	7	8	9	10
Demand	25	30	20	35	25	30	25	35	30	25
LFL										
FOQ = 35										
POQ 2 periods										
POQ - 2 periods Min. Qty. = 60										
POQ - 2 periods Multi. Qty. = 25										

Intro-eB-PLNG-160

Order Policy and Modifier

Check your answers with the chart on page 299.

MRP Options (1 of 3)

23.3 – Selective Materials Plan

1. Forecast
2. Run Selective MRP (MPS Items Only)
3. Review Messages
4. Enter MPS Orders
5. Run Selective MRP (Non-MPS Items)

Selective Materials Plan

User Menu Edit Queue Options Help

Item Number: To:
 Site: 10000 To: 1000Q

Master Scheduled Items: ☐ no Buyer/Planner:
 Non Master Scheduled Items: ☐ yes Prod Line: 1000
 MRP Items: ☐ yes Group:
 DRP Items: ☐ no Item Type:
 Required Items Only: ☐ yes Supplier:
 Resolve Low Level Codes: ☐ no Pur/Mfg:

Synchronized Calculation: ☐ yes
 Synchronization Code:

Output:
Batch ID:

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy Ctrl-V=Paste

Intro-eB-PLNG-180

MRP Options

Selective Materials Plan

Menu Number 23.3

Use Selective Materials Plan only when you want to plan the items and site you select. You can choose to plan Master Schedule items, MRP items, DRP items, and so forth.

The Master Scheduler uses this when developing the Master Schedule. Small groups of items can be replanned by selecting the buyer/planner, product line, group, type, and supplier.

Selective planning just plans the items selected. It does not implode to recalculate item demand. Nor does it explode resulting orders to recalculate component demand.

MRP Options (2 of 3)

23.1 – Net Change Materials Plan

Net Change Materials Plan

User Menu Edit Queue Options Help

Site: 10000 To: 10000

Synchronized Calculation: yes

Synchronization Code:

Output: Window

Batch ID:

Intro-eB-PLNG-181

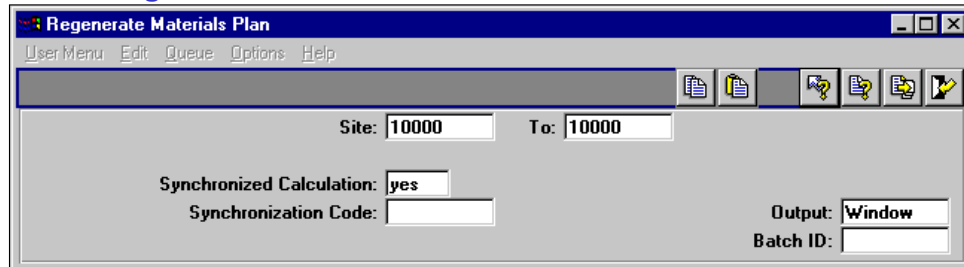
Net Change Materials Plan

Menu Number 23.1

Net change replans items that have had changes made against them since the last MRP run. Typically, net change MRP is run every day. The MRP Required flag in Item-Site Planning Inquiry 1.4.8 will be Yes if an item needs to be replanned.

MRP Options (3 of 3)

23.2 – Regenerative Materials Plan



Regenerate Materials Plan

User Menu Edit Queue Options Help

Site: 10000 To: 10000

Synchronized Calculation: yes

Synchronization Code:

Output: Window

Batch ID:

Intro-eB-PLNG-182

Regenerative Materials Plan

Menu Number 23.2

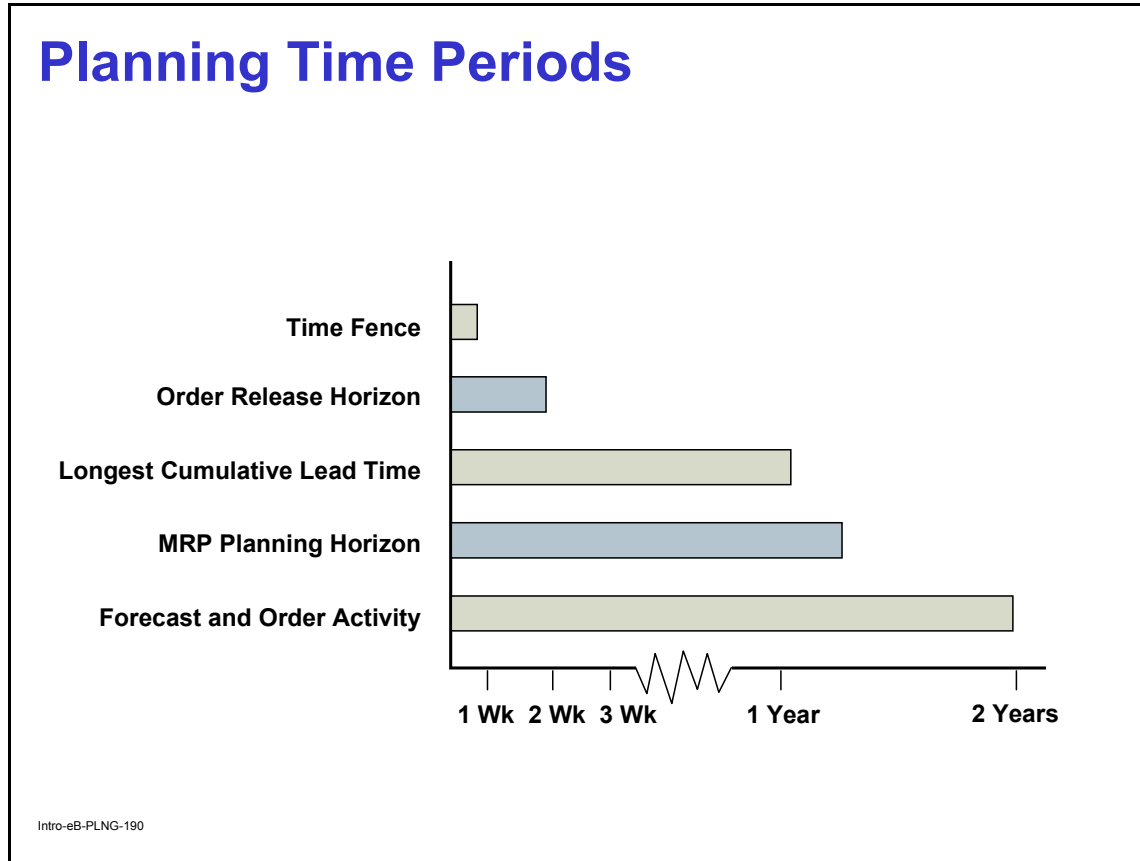
Regenerative replans all items in the database for the specified site. The first time you run MRP, it should be regenerative. The output of net change and regenerative are the same, and the method chosen is typically based on system performance rather than the calculations themselves.

Planning by Site

In MFG/PRO eB, MRP planning is always done by site; the plan for one site is completely independent from plans for other sites. The link between plans comes from DRP.

MRP and DRP can be run in one step by specifying DRP Items when you run Selective Materials Plan. If more than one site is managed in a single database, a combined MRP/DRP can be run for all sites in that database.

MFG/PRO eB maintains low-level codes for all items within a database and plans in sequence of those low-level codes.



Planning Horizon

Plan Cum LT

Before you run MRP, you set the MRP planning horizon. This specifies a period of time, in calendar days, over which MRP is to plan. MRP only processes material requirements within this horizon. The longer this horizon, the longer it takes MRP to plan.

However, the planning horizon should be at least as long as the longest cumulative lead time, plus any associated preparation times. Usually, the Master Schedule also covers a time frame that is at least this long.

Critical Path

Cumulative lead time represents the longest number of calendar days to obtain an item, assuming that neither it nor any of its components (if any) are in stock. For a manufactured item, this includes the time it takes to acquire raw materials, inspect them, make any subassemblies or components, and assemble and inspect the finished product.

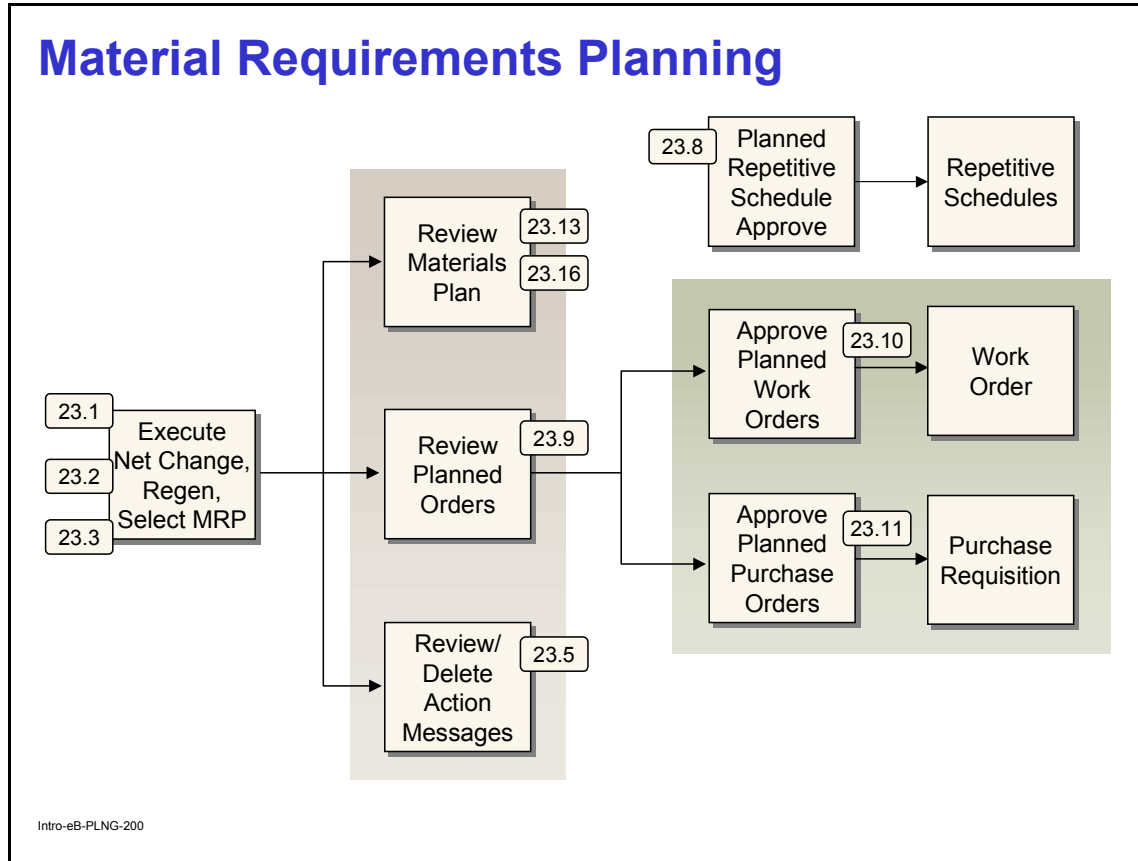
These times are entered in Item Planning Maintenance 1.4.7 for each item in the fields Mfg LT, Pur LT, and Ins LT. Items acquired via DRP also have a Mfg LT value entered—this should include transit and order time.

This time is not used for planning DRP items; it is used only in cumulative lead time calculations.

Future Visibility

To provide visibility for what orders are due to be released, MRP generates Release Due action messages. Typically, you would like to see these in advance, not just on the day the order is due for release.

You can set the release horizon for any number of days. MRP generates Release Due messages only for orders due to be released within this number of days from today's date.



Planned Orders

Status: Firm Planned

MRP creates planned purchase and work orders when the Plan Orders flag in the item master is set to Yes. These planned orders can be approved by the planner, generating either purchase requisitions or firm-planned work orders.

Purchase Orders

You can enter purchase requisitions manually in Purchase Requisition Maintenance 5.1.4 or create them by approving an MRP-planned purchase order in Planned Purchase Order Approval 23.11. Requisitions are then treated as firm-planned orders by MRP.

This means that if purchasing is not able to buy the item to satisfy the requisition, then it should be deleted.

When a purchase order is subsequently entered to satisfy the requisition, the requisition is automatically deleted from the system.

Work Orders

Firm-planned work orders can be created by entering them manually in Work Order Maintenance 16.1 by changing the status in Multiple WO Status Change 16.8 of an existing planned work order, or by approving an MRP-planned work order in Planned Work Order Approval 23.10.

Building Purchased Items

It is possible to approve a planned work order for a purchased item or approve a planned purchase order for a manufactured item. The Pur/Mfg field just indicates what the normal procedure would be and not what it must be.

By approving a firm-planned work order or purchase requisition, you are telling the system:

- The next time MRP is run, do not change the quantity or the due date on the order

Instead, an action message is produced recommending action you should take

Normally, you do not want to approve planned orders beyond the order release horizon, or the number of action messages becomes too unwieldy to be useful.

Repetitive Schedules

MRP to Repetitive Approval Phase 2 provides enhanced control over production line schedule sequencing by introducing primary and secondary run sequences.

Users can specify primary and secondary run sequences for any item manufactured on a production line. When MRP planned orders for these items are approved using Planned Repetitive Sched Approve 23.8, they can be sorted and sequenced using run sequences. This lets users schedule items on a production line in the most efficient sequence possible.

Action Messages

23.5 – Action Message Review/Update

Date	Action Message Detail	Order Number	Quantity
09/26/96	Release due for Planned Order Due date: 09/27/96	09060002	70.0

Intro-eB-PLNG-210

Action Message Review Update

Menu Number 23.5

MRP Changes Planned Orders

When MRP runs, it automatically changes any of its own planned orders to reflect any changes in the plan. If a planned order is needed earlier, MRP reschedules it.

However, MRP cannot automatically change your firm-planned or released manufacturing orders. It also cannot make any changes within the specified time fence. All it can do is make recommendations to you as to what you should do in order to balance supply and demand.

Action Messages for Other Changes

Action messages are MRP's recommendations.

Usually, the first thing the planner does after running MRP is to look at the action messages. Action messages can be reviewed on-line and deleted as the required action is taken. They can also be printed along with the detailed plan.

Print by Action Code

Obviously, some of these messages are much more important than others—de-expediting or canceling an unnecessary order is not as important as expediting a needed one; the latter could shut down your production line.

The Action Message Report 23.7 lets you print action messages by action code so you can handle the most important first.

Period	1	2	3	4	5	6	7	8	9	10
Demand	25	30	20	35	25	30	25	35	30	25
LFL	25	30	20	35	25	30	25	35	30	25
FOQ = 35	35	35	35	35	---	35	35	35	35	---
POQ 2 periods	55	---	55	---	55	---	60	---	55	---
POQ - 2 periods Min. Qty. = 60	60	---	60	---	60	---	60	---	60	---
POQ - 2 periods Multi. Qty. = 25	75	---	---	75	---	50	---	75	---	25

Intro-eB-PLNG-170

Answer to chart on page 288

Planning Activities



Intro-eB-PLNG-215

Planning Activities

In this activity you:

- Review planning data and run Net Change MRP
- Run a report to batch and print the report in batch
- Review action messages and approve planned orders

Review Planning Data and Run Net Change MRP

- 1 Review Item-Site Planning Inquiry 1.4.8 and add the following data in Item-Site Planning Maintenance 1.4.17, if necessary:

	<u>Parent Item</u>	<u>Component Items</u>
Plan Orders:	Yes	Yes
Order Policy:	POQ	POQ
Order Period:	7	7
Pur/Mfg:	M(manufactured)	P(purchased)
Pur LT:	Blank	5 days

Run a Report

This four-step activity illustrates how reports and scheduled programs are prioritized and run by system administrators.

- 1 In Batch ID Maintenance 36.14.1, set up a batch ID called “later.”
- 2 Go to Net Change Materials Plan 23.1.
 - a Reference “later” in the Batch ID field and run MRP.
 - b Run Action Message Report 23.7 to batch.
- 3 Use Batch Request Detail Maintenance 36.14.3 to modify the priority on one of the reports. To locate the batch request, enter the letter L in the Batch ID field and press the down arrow until you locate the record.
- 4 Use the Batch Request Processor 36.14.13 to print the reports in batch.

Review Action Messages and Approve Planned Orders

- 1 Review the MRP Summary Inquiry 23.13 and MRP Detail Inquiry 23.16 for parent and component items at your manufacturing site.
- 2 Review Action Message Report for each of your items.
- 3 Based on Action Message Report, approve any MRP-planned work orders using Planned Work Order Approval 23.10. Selection criteria are:

Site: Manufacturing Site to Manufacturing Site

Release Date: Blank to date one week in future

Default Approve: No

Include Purchased Items: No

- 4** Select the orders that need to be approved, change the approved flag to Yes.
 - a** Update, and exit.
- 5** Go to Work Order Browse/Inquiry 16.2 to see if the status of the planned orders changed from P (Planned) to F (Firm Planned) when you did the approval.
- 6** Based on Action Message Report, approve any MRP-planned purchase orders with Planned Purchase Order Approval 23.11. (Purchase requisitions, not purchase orders, are created when you approve the order.) Selection criteria are:

Site: Manufacturing Site to Manufacturing Site

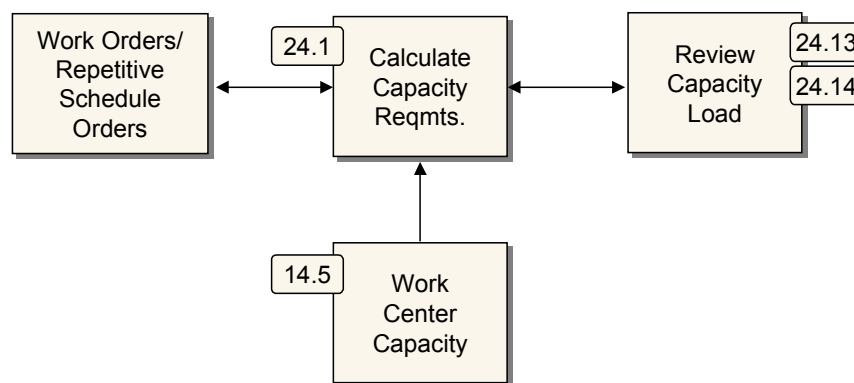
Release Date: Blank to date two weeks in future

Default Approve: No

Include Manufactured Items: No

- 7** Select the orders that need to be approved, change the approved flag to Yes.
 - a** Update, and exit.
- 8** Check Purchase Requisition Browse/Inquiry 5.1.5 to make sure that planned orders have been changed to purchase requisitions.

Capacity Requirements Planning



Intro-eB-PLNG-220

Capacity Requirements Planning (CRP)

Shop Floor Control Functions

The master schedule and MRP both place demands on your manufacturing facility.

Unlike the rough-cut resource plans generated for the product line plan and the master schedule, capacity plans are detailed—showing the number of hours of work scheduled at each work center and machine in your facility.

Capacity planning can be used to test the feasibility of the plan, but as a shop floor control function rather than a planning tool. It does not dictate changes to the plan, but instead can result in slight adjustments to the schedule or temporary increases in capacity (overtime, for example).

Capacity planning is usually recalculated after an MRP run. It looks at all sources of load—from all work orders and repetitive schedules, including MRP-planned orders.

MRP does not consider capacity and will plan an infinite amount based on the order rules set up in the item planning data.

Rather than looking at a simulated resource bill, CRP looks at the production routing for the item. This lists in detail each operation step in the manufacture of a given item, where that step takes place, and how long it takes.

Backward Schedules

CRP uses a technique called backward scheduling. It takes the due date of the order and schedules each of the operations from the last one backward to the first one.

Each operation is assigned a stop and a start date. (The start date of the last operation becomes the stop date of the previous operation.)

All run times are calculated using the actual order quantity.

Note If backward scheduling results in a start date before today, we then forward schedule the item to compress lead times.

The overlap units on each routing operation and the machines per operation will affect the calculated start and stop dates based on the order quantity.

Your lead time will be excessive if your overlap units are zero or machines per operation is set to less than the number of machines at the work center. These fields should be set to these numbers only if they reflect actual processing at your company.

Work Center Load

24.13 – Work Center Load Summary Inquiry

Description: ASSEMBLY	Run Crew: 1.000						
Department: 10	Mach/Wk Ctr: 1.000						
Queue Time: 1.0	Wait Time: 0.0						
	Mach/Op: 1						
Past	01/12/01	01/19/01	01/26/01	02/02/01	02/09/01	02/16/01	
	01/11/01	01/18/01	01/25/01	02/01/01	02/08/01	02/15/01	02/22/01

Workdays	20	5	5	5	5	5	5
Work Ctr Cap	1,280	320	320	320	320	320	320
Work Ctr Load	70	0	125	120	140	140	140
Cap Less Load	1,210	320	195	200	180	180	180
Cumulative	1,210	1,530	1,725	1,925	2,105	2,285	2,465
-							

Intro-EB-PLNG-230

Work Center Load Summary Inquiry

Menu Number 24.13

Projected Load

Each of the operations now has a scheduled start date and a set-up and run time for each order. Each of these operations is also scheduled on a particular work center and machine.

This information is used by CRP to determine the projected workload at any work center and machine. This can be presented in aggregate by department as well.

Capacity

Each work center has a capacity limited by the number of machines or people in the work center and the number of days and hours the plant is open for production.

This is identified in the Calendar Maintenance 36.2.5 and Holiday Maintenance 36.2.1.

Infinite Capacity

CRP inquiries, such as the one shown above, compare projected load with capacity.

Note that the system uses infinite capacity planning techniques, not finite ones. This means that operations are scheduled at work centers regardless of available capacity. It is up to the production planner to review the scheduled load and reschedule operations to balance this load or increase capacity.

The summarized and graphic format show overload and under-load conditions, along with the cumulative position. An on-going cumulative overload indicates a planning problem; you cannot meet the plan without significantly increasing capacity.

This is done by adjusting the machines (people) at a work center or adding hours to the calendar (add a shift). Short-term overloads can usually be managed by rescheduling or working overtime.

Rescheduling orders is done by changing the due date of a firm-planned order to a time when capacity is available. MRP should be rerun to make sure this change does not cause material shortages.



Planning Activities

In the following activity you:

- Calculate the capacity requirements plan and view the load summary and detail
- Adjust capacity or load as necessary to balance the plan

Calculate CRP and View the Load Summary and Detail

- 1 Run Recalculate Capacity Plan 24.1 to calculate the capacity plan.
- 2 Check the Work Center Load Summary Inquiry 24.13 to see if the load exceeds capacity.

Balance the Plan

- 1** Adjust any or a combination of the following to change the load or the capacity:
 - a** Modify the number of machines available in the work center using Work Center Maintenance 14.5.
 - b** Modify the number of calendar days/hours in the shop calendar using Calendar Maintenance 36.2.5
 - c** Modify the load by adjusting the forecast using Forecast Maintenance 22.1 and rerunning MRP using Net Change Materials Plan 23.1
- 2** Adjust any of the following or a combination of the following to change the lead time for manufacturing the orders:
 - a** Modify the overlap units in the routing using Routing Maintenance 14.13.1
 - b** Modify the Machines/Op value in the routing using Routing Maintenance 14.13.1
 - c** Rerun Routing Cost Roll-Up 14.13.13 and Product Structure Cost Roll-Up 13.12.13
- 3** Run Recalculate Capacity Plan 24.1, after making any necessary adjustments.

Instructions: In the following activity we go through the basic processing functions and look at how they affect planning. During this activity you add purchase orders (POs) using purchase requisitions, and receive them, release MRP-approved work orders, issue components, report labor, receive and close work orders, and add, ship, and invoice a sales order.

Add and Receive Purchase Orders Using Requisitions

- 1 Use Purchase Order Maintenance 5.7 to add a purchase order with each of your component items on a purchase order line.
 - a On the line, in the Req (requisition) field, use your look-up browse to select a requisition.
 - b On the line detail, change the PO due date to be the same as the PO need date.
 - c Update and exit.
- 2 Run Net Change Materials Plan 23.1.
- 3 Check MRP Summary Inquiry 23.13 and MRP Detail Inquiry 23.16 for each of your component items. You should see that the planned order has changed to a scheduled receipt.
- 4 Receive your purchase order using Purchase Order Receipts 5.13.1.
- 5 Check MRP Summary Inquiry 23.13 and MRP Detail Inquiry 23.16 for each of your component items. You should see that the scheduled receipt (purchase order) has changed to inventory on hand.

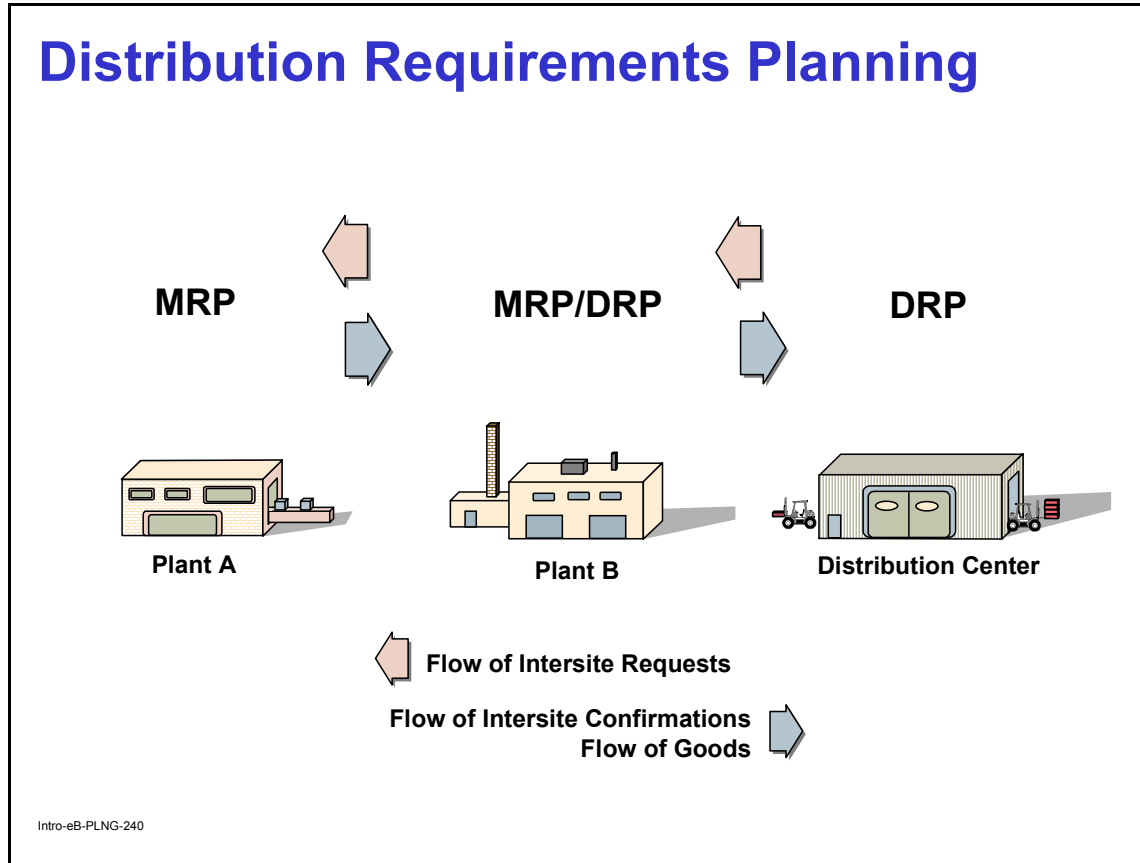
Issue Components, Report labor, Receive and Close

- 1 Use Work Order Browse/Inquiry 16.2 to find the MRP firm-planned orders (status F for Firm Planned).
How does this order number differ from the order number created when you manually entered the work order?
- 2 Use Work Order Release/Print 16.6 to release your firm-planned orders.
- 3 Check MRP Summary Inquiry 23.13 and MRP Detail Inquiry 23.16 for your parent item.
You should see that the planned order has changed to a scheduled receipt.
- 4 Use Work Order Dispatch Report 16.18 to review your released work orders.
- 5 Issue components to your work order using Work Order Component Issue 16.10.

- 6** Use one of the shop floor labor transactions to report labor against your work order:
 - a** Labor Feedback by Work Order 17.1
 - b** Labor Feedback by Employee 17.2
 - c** Labor Feedback by Work Center 17.3
- 7** Check Input/Output Inquiry 17.11 between reporting labor at each operation to see how the load in the work center changes as you report work complete.
- 8** Use Work Order Receipt 16.11 to receive parent item into inventory and close the work order.
- 9** Check MRP Summary Inquiry 23.13 and MRP Detail Inquiry 23.16 for your parent item.
You should see that the scheduled receipt (work order) changed to inventory quantity on hand.
- 10** Transfer the on-hand inventory of your parent item at the manufacturing site to the distribution site using Transfer-Single Item 3.4.1.

Add, Ship, and Invoice a Sales Order

- 1** Review your open sales orders using Sales Order Browse/Inquiry 7.1.2.
- 2** If you do not have an open sales order for your parent item, add a new sales order at your distribution site, using Sales Order Maintenance 7.1.1, that will consume most of your inventory.
- 3** Ship the sales order using Sales Order Shipments 7.9.15.
- 4** Print and post the invoice using Invoice Print 7.13.3 and Invoice Post 7.13.4.



Distribution Requirements Planning (DRP)

Site A Supplies Site B

So far we have looked at how component requirements can be planned for purchased and manufactured items.

What about items acquired from another site? Unless that site is in another country, you may not need to go through all the trouble of generating a purchase order.

What if you have two factories right next door to one another—one makes cans and the other fills them with juice? Then you would use DRP.

Supplying/receiving Sites

DRP is meant for companies with multiple sites having interdependencies of supply and demand. Typically, these sites are on different databases and different computers, but they can be managed all in one database.

The main thing is that one site (the supplying site) provides materials to another (the receiving site).

Source Network

Supplying and receiving sites are linked together via the source network that identifies which site is the receiving site and which sites are the source sites.

There can be multiple source networks, each one identified by a network code and assigned to a different planner. Within a single source network there can be multiple site-to-site relationships.

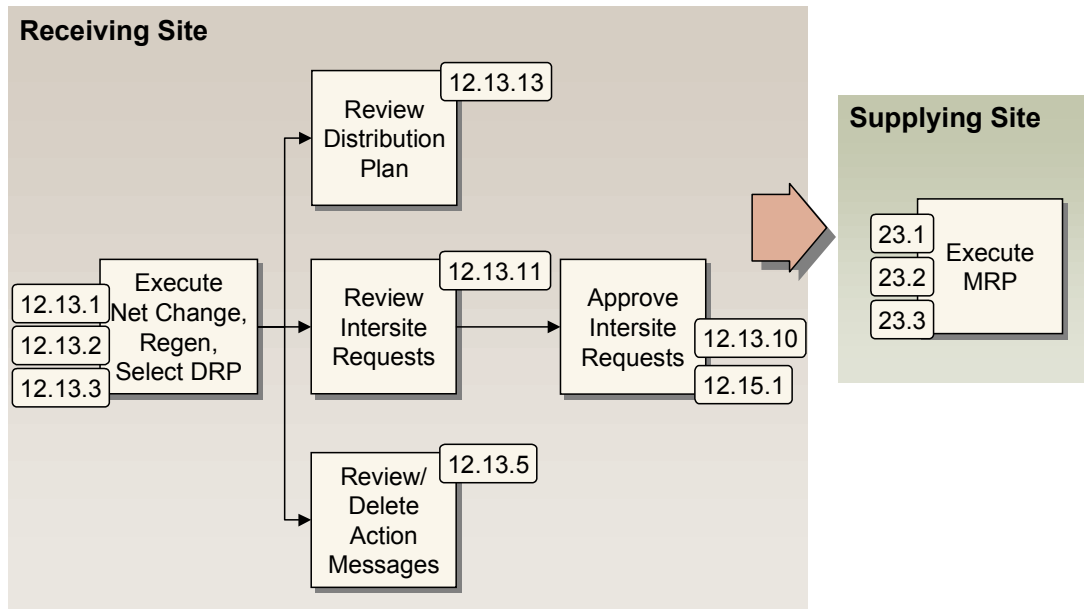
In the example above, there are two relationships: the DC to Plant B, and Plant B to Plant A. Each DRP item is flagged as a D item and is assigned to a specific source network in Item-Site Planning Maintenance 1.4.17.

Planning Sequence

When you run DRP, sequence is important. Because the DC generates demands on Plant B, it is necessary to generate those demands by running DRP at the DC before you run MRP or DRP at Plant B. Similarly, planning needs to be run at Plant B before planning is run at Plant A.

For this reason, one planner is often responsible for the planning process.

DRP Receiving and Supplying Sites



Intro-eB-PLNG-250

DRP at the Receiving Site

DRP calculations are done at the receiving site.

Notice that DRP functions are almost identical to the standard MRP functions. In fact, the calculations for DRP and MRP use the same algorithms when time-phasing supply and demand, netting requirements, planning supply, and reporting exceptions.

Because source networks are to DRP as product structures are to MRP, the explosion logic is also the same, except that DRP explodes source networks for distribution items and creates intersite requests.

MRP explodes product structures for manufactured items and creates planned orders.

Plan by Site

Like forecasts, master schedules, and material plans, distribution plans are maintained by site. Because MRP plans by site and DRP plans by site, it is vital that these plans be coordinated across the distribution network.

Inter-site Requests

When DRP runs at the receiving site, it generates inter-site requests, that is planned orders for materials to be supplied from other sites.

This enables the same logic as MRP, using item-site planning parameters such as order policy and lot size.

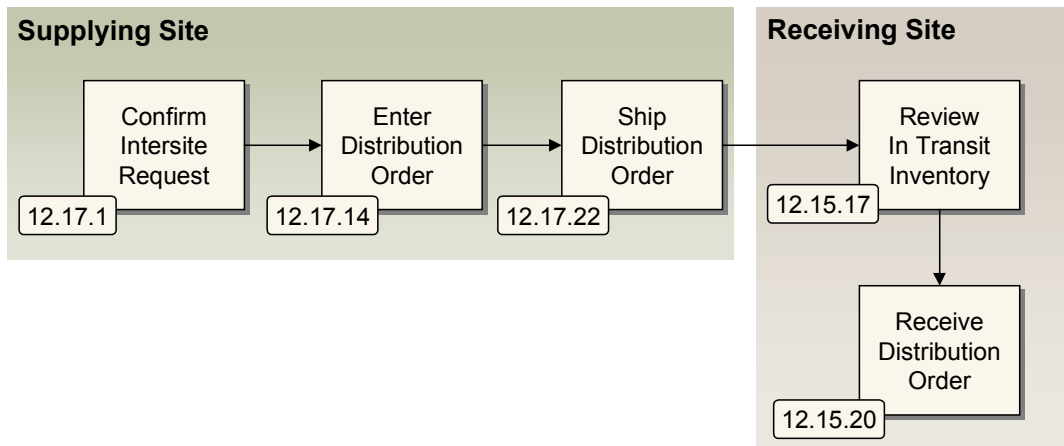
As with MRP, if the Plan Orders flag is set to No for a distribution item, then only an action message displays, and the planner must enter any intersite requests manually.

- Each inter-site request specifies the:
 - Supplying site
 - Quantity ordered
 - Due date
 - Ship date
 - Transport code

Auto or Batch Transfer

If all databases are connected when DRP is run, then inter-site requests are transferred immediately to the other sites. If not, they are held and can be exported or transferred at a later time. The export generates an ASCII file that must be sent to the other site and imported. The transfer does an on-line data transfer.

DRP Supplying and Receiving Sites



Intro-eB-PLNG-260

DRP at the Supplying Site

Inter-site Demands to MRP

Inter-site requests, once transferred or imported at the supplying site, become inter-site demands on that site. These feed directly into MRP at that site as a source of demand. The source site can acknowledge the request and adjust it manually if needed.

If the request cannot be satisfied as specified, the confirmation function can be used to change the quantity, due date, ship date, or transportation code. These changes are communicated back to the receiving site automatically and are reflected in the next DRP calculation.

Combine on Distribution Order

The confirmation step is optional. Instead, the supplying site can enter a distribution order directly. Distribution orders are used to combine inter-site requests in much the same way purchase orders are used to combine purchase requisitions. Each distribution order line item can reference an inter-site request, effectively confirming that request.

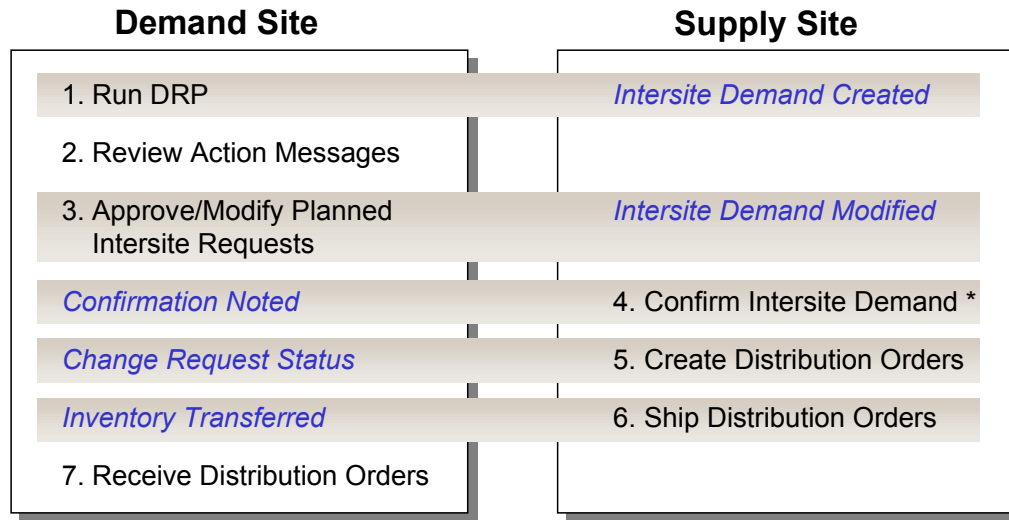
Any changes in quantity, due date, or ship date are communicated back to the receiving site for replanning.

Picklist and Ship Distribution Order

The main use of the distribution order is to simplify picking and shipping of materials from one site to another. At the supplying site, the distribution order can be used to generate a picklist and shipping documents. The distribution order is referenced when the items are shipped from the supplying site and again when the items are received at the receiving site.

Note The assumption is that networks are reliable. If a database is down or not connected, confirmations and changes cannot be processed until the database comes up. Because DRP can run disconnected, the validation function is used to ensure the supply site has the most up-to-date requests.

DRP Life Cycle



*optional step

Intro-eB-PLNG-270

DRP Life Cycle

Central sales orders requires that the system coordinate data between the inventory and sales sites; so does DRP. When the DRP calculation is run at the demand site, it generates intersite requests for the demand site and, at the same time, intersite demand in the supply site.

The actual calculation is similar to the MRP calculation. DRP generates orders and action messages, just as MRP does. The orders are the previously mentioned intersite requests.

But DRP, unlike MRP, does not require that the orders be approved. You can review action messages, approve requests, or modify requests. If you do modify a request, its status is changed to Firm, as if you have approved it. If you do nothing, the intersite demand appears at the other site.

At the supply site, the demand may be confirmed, but confirmation is not necessary. The two main demand site actions are to aggregate the demand records into distribution orders and to ship the order. The distribution order may be thought of as the paperwork for the shipment.

The distribution order is picked and shipped like sales orders are picked and shipped. Ordinarily, transfer of the value of goods occurs at shipment, but this can be changed. The receipt of the distributed order is handled like purchase order receipts are handled.

Transportation Management

- ◆ Identify modes of transport (vehicle IDs)
- ◆ Maintain:
 - Lead times for transit between sites
 - Load/unload time
 - Capacity of transport mode
 - Freight rates
 - Open/closed dock dates at source/receiving sites

Intro-EB-PLNG-280

Transportation Management

Transport ID

Each link in the source network can specify a normal mode of transportation, identified as the value in the Transport Code field. It is the default on intersite requests between sites.

For shipments between sites via a given transport mode, you can record the normal lead time (load, transit, unload), fixed shipping schedule, and any exceptions to that schedule (holidays). DRP calculations use this information to determine lead time and calculate due dates.

At the supplying site, each distribution order specifies a transport ID (vehicle).

Total capacity of that vehicle can be compared with projected load. In fact, distribution orders can be created by selecting intersite requests just up to a target weight or cube—setting them up to load each vehicle just to its capacity.

Project Transport Load

Transportation load inquiries and reports enable review of projected load vs capacity. Like Resource Planning and CRP reports, these show overload and under-load situations as well as the cumulative overload or under-load.

Consistently exceeding capacity is a problem. If you have a fleet of only five trucks and consistently need seven, how much money are you spending on outside haulage?

In-Transit Inventory

When inventory is issued/received using distribution orders, it is actually transferred to and from an in-transit site and location. The in-transit site defaults to the receiving site, assuming that title is transferred to the receiving site as soon as the material is shipped (FOB Destination), but it can be changed manually to be the supplying site.

The location should be set up for in-transit inventory with the same name as the transport ID, so you can track the material and how it was sent.

In-transit inventory can be reviewed by the receiving and supplying site. In-transit locations should always have a status that is not nettable so that DRP/MRP does not count the location as inventory as well as the distribution order as supply.

Planning Activities



Intro-eB-PLNG-285

Planning Activities

In the following activity you:

- Do the necessary setup of network codes, items, transportation codes, and locations prior to running DRP
- Run DRP, and review the outputs

Set Up Prior to Running DRP

- 1 Use Network Code Maintenance 12.1.1 to define a network code for your shipments from your manufacturing site to your distribution site.
- 2 Set up a transportation mode using Transportation Mode Maintenance 12.5.1.

Define the amount of lead time it takes to load and unload this mode of transport.

- 3** Define the transit lead time required to get to your distribution site from your source site in Transportation Network Maintenance 12.5.5 using the transportation mode set up in the previous step.
- 4** In Source Network Maintenance 12.1.13 set up the hierarchy of the supply chain by defining the receiving site (the distribution site) and the source site (the manufacturing site) for the network code you set up in step 1.

Be sure to reference the transport mode you set up in step 2.

- 5** Modify the planning data for your item at your distribution site using Item – Site Planning Maintenance 1.4.17. The item at this site is not manufactured but distributed, so the Pur/Mfg needs to be changed to D. Add the network code in the network code field so DRP can place intersite demand on the source site.
- 6** Set up an in-transit inventory status in Inventory Status Code Maintenance 1.1.1 that is Not Nettable and Not Available.

- 7** Set up an in-transit location in Location Maintenance 1.1.18 where the location code is the same as the transport code.

Use the in-transit inventory status for this location. This location needs to be in the site that will own the material when they are in transit. This is known as the goods-in-transit (GIT) location.

The default goods-in-transit site is the receiving site. The inventory in a goods-in-transit location should not be nettable, because the distribution order is considered a scheduled receipt as well as inventory.

- 8** Use Forecast Maintenance 22.1 to delete the forecast you set up at the manufacturing site. Add forecast at the distribution site for the next three months. Increase the quantities significantly, keeping in mind your capacity.

Run DRP and Review the Output

- 1** Run Regenerative Distribution Plan 12.13.2 to calculate the distribution requirements plan for the parent item (demand site).
- 2** Use DRP Detail Inquiry 12.13.16 to review the planned intersite requests created to meet the forecast demand for your parent item at your distribution site.
- 3** Use DRP Detail Inquiry 12.13.16 to review the intersite demand created at your manufacturing site to meet the demand from your distribution site.

- 4** Check the action messages using DRP Action Message Review/Update 12.13.5.
- 5** Approve the planned intersite requests (distribution site) for the first week using Planned Intersite Request Approval 12.13.10.
- 6** Use Net Change Materials Plan 23.1 to run MRP at your manufacturing site to plan orders to meet the demand.
- 7** Review the MRP Summary and Detail Inquiries 23.13 and 23.16 and compare them to the DRP Summary and Detail Inquiries 12.13.13 and 12.13.16.



Course Overview

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ Set Up and Use MFG/PRO eB
 - ✓ Planning Systems
 - ♦ Advanced Processing
 - ♦ Accounting Systems

Intro-eB-PLNG-290

What's next?

MFG/PRO eB offers processing options and functions in addition to the basic functionality. The next chapter covers some of the advanced processing functionality in MFG/PRO eB.

CHAPTER 7

MFG/PRO eB Advanced Processing





Advanced Processing in MFG/PRO eB

In this section you learn how to:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ **Set Up and Use MFG/PRO eB**
 - ✓ Planning Systems
 - ✓ **Advanced Processing**
 - Accounting Systems

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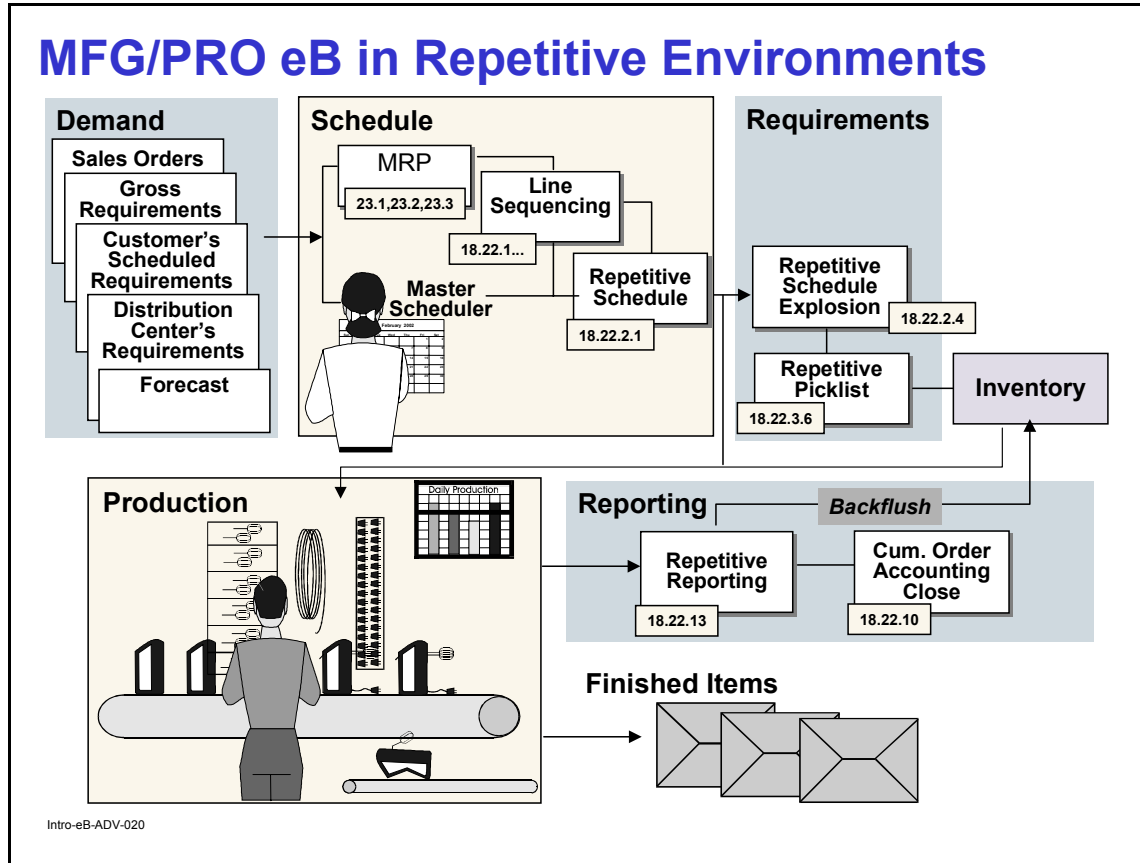
Advanced Processing

In this chapter we look at some of the processing options and functions available in addition to the basic functionality.

We also describe how MFG/PRO eB accommodates a variety of manufacturing and distribution environments and provides flexibility.

Specifically, this chapter discusses:

- Repetitive
- Supplier Schedules
- Customer Schedules



Repetitive

Another way to manage production is by using the repetitive functions. These are typically used in high-volume environments where an entire product is built on the same production line. Generally, in this type of environment, there are:

- Stable bills
- Few substitutions
- Relatively short lead times

Scheduled Production

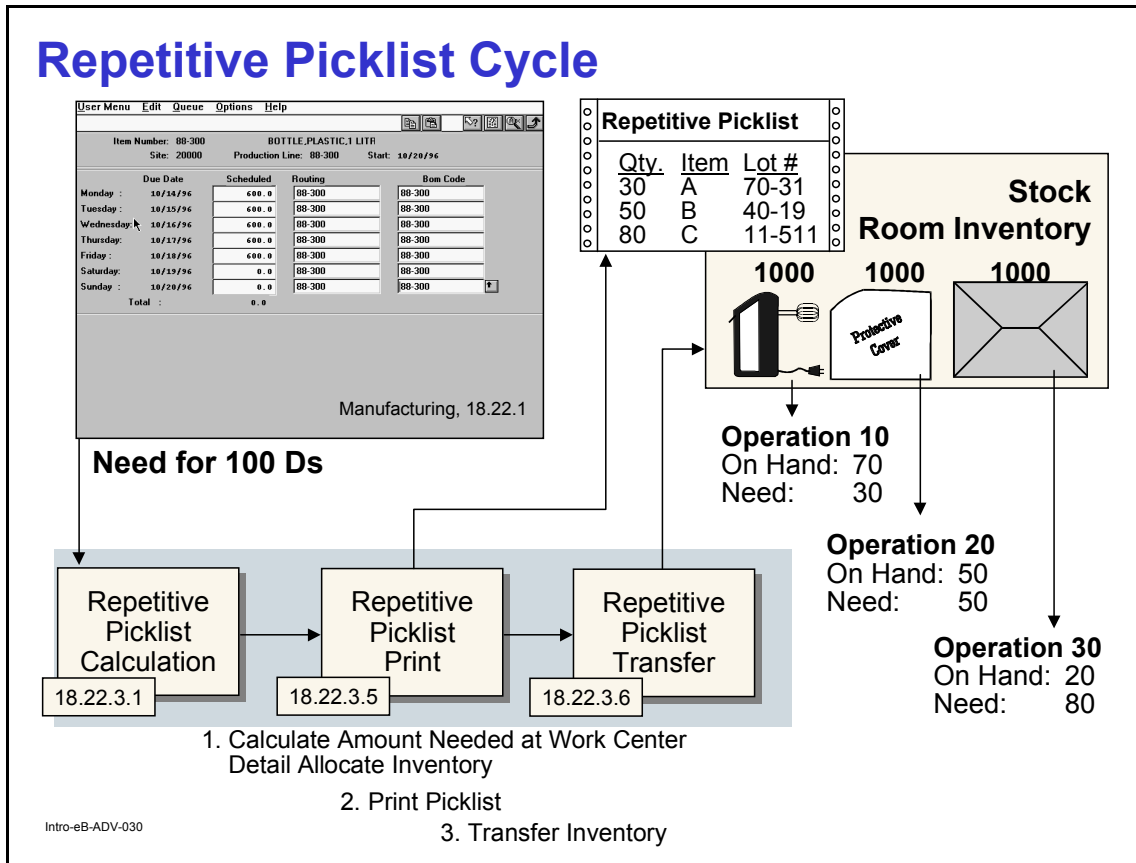
In repetitive you are not dealing with individual work orders—production is driven by a production schedule. First a schedule is entered, then it is exploded to determine material and capacity requirements, and then all production is reported against this schedule.

Completions per Day

The daily production schedule is expressed as the quantity of production expected to be completed that day. This can be generated from a production line sequence, or you can enter it manually for each item to be produced.

Because component requirements are not exploded when a schedule is entered, these production schedules can be entered very quickly. All or part of the schedule is exploded later, in batch.

Note Some companies use repetitive Schedule Maintenance 18.22.2.1 to enter their Master Schedules, but then use work orders to manage production. This can be done—you just release the repetitive scheduled orders in the Work Orders module. From there on, they are treated as regular work orders.



Repetitive Picklist Cycle

With repetitive, inventory issues are handled by backflushing. This decrements inventory automatically based on the quantity received at any operation (usually a milestone operation).

With product structures and formulas, each component and ingredient can specify an operation. This designates the point of use for that item and at what point in the process that component item is to be backflushed. Components are backflushed when their specific operation or the next milestone operation is reported.

Modify Backflush

The standard backflush automatically issues components from the inventory location defined in Item Inventory Data Maintenance 1.4.5 and the site from the repetitive schedule.

A modify backflush option lets you adjust the backflush prior to processing it, so you can enter lot/serial numbers, issue substitute items, or change quantities.

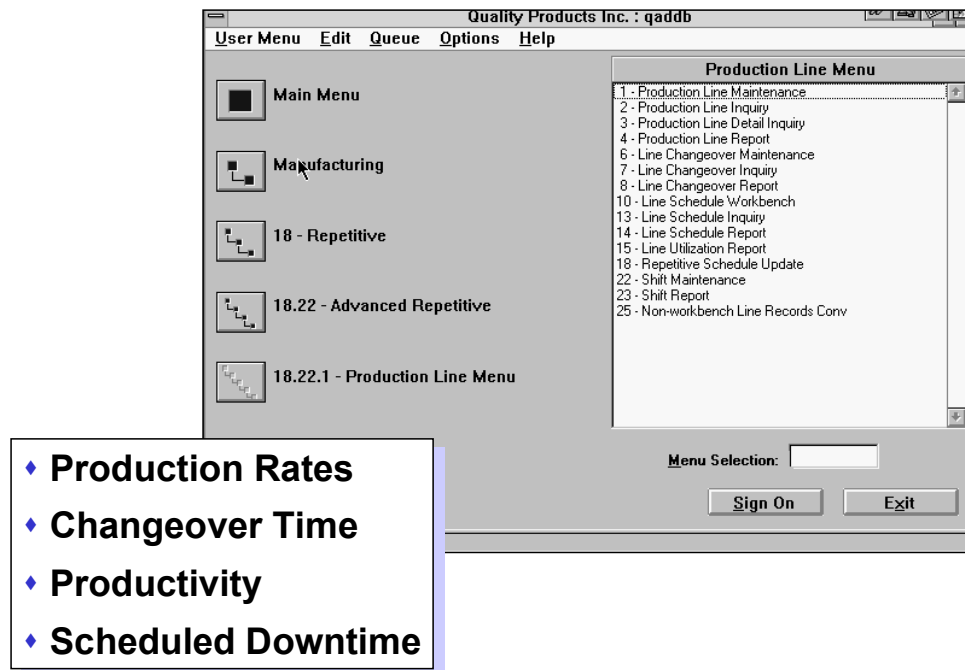
Repetitive Picklist Transfer

Some companies stock the production line with component inventory. MFG/PRO eB helps you do this by producing a repetitive picklist. The picklist calculates how much inventory you need to move to the production line in order to support scheduled production for a specified number of days. A picklist is printed and the items are transferred to the line location.

Location Code = Work Center

If you set up a location code that matches the work center code, the backflush transaction automatically backflushes components from the work center location rather than from inventory. (Line locations can go negative.)

Repetitive – Line Sequencing



Intro-eB-ADV-040

Repetitive–Line Sequencing

Finite Forward Load

Another feature of the Repetitive module is Line Sequencing.

These functions are used to quickly develop repetitive schedules based on MRP plans using finite forward loading techniques. Load is constrained by:

- Standard hourly production rates
 - Specified by production line and item with different rates effective for different periods
- Shift schedules and productivity with a different number of:
 - Shifts

- Hours per shift
- Productivity percentage for each shift
- Line Changeover Times specified by item and direction
 - Changing from white paint to red takes less time than changing from red to white

Line Schedule Workbench

Once the constraints are established, use the Line Schedule Workbench 18.22.1.10 to sequence production on each of your production lines.

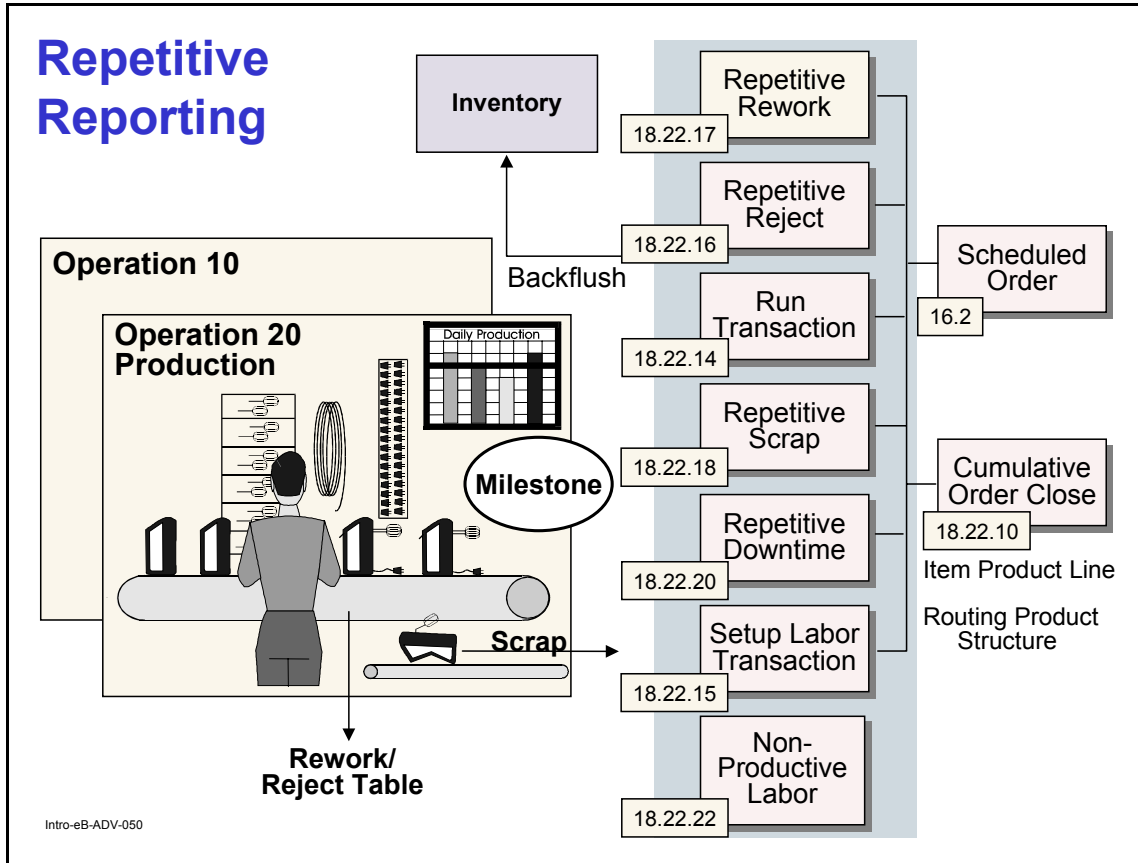
The scheduler reviews the planned orders and determines how much of each item to make and in what sequence. As you enter items into the sequence, the system automatically forward loads production on that line.

First, it uses the standard production rate to calculate the number of hours it takes to manufacture that quantity. Then it forward loads this number of hours, up to the maximum number of hours each day (considering the number of shifts and their productivity). When switching from one item to the next, changeover time is included.

Update Repetitive Schedule

Once you are satisfied with the line schedule, use it to update the repetitive production schedules for each item.

Actual production results are always recorded against the repetitive schedule, not the line schedule.



Repetitive Reporting

Backflush Transaction

Use repetitive Backflush Transaction 18.22.13 to report labor and to backflush component materials from inventory. At the final operation, the finished assembly is moved into inventory.

The quantity of rejects, scrap, and rework can also be reported using a backflush or specific transactions. Report run and set-up labor using the backflush transaction or a specific transaction designed to report this labor.

Work in Process (WIP) Status Inquiry

When a quantity is reported complete from one operation, the import queue is decremented and the output queue incremented. The import queue for the next operation is increased by the number of good parts moved.

The WIP Status Inquiry 18.22.12 is a key function that reports the WIP queue quantities for selected cumulative orders. Also reported are the cumulative activities affecting each of the queue quantities, such as:

- Cumulative quantity complete
- Scrapped
- Rejected
- Adjusted
- Reworked
- Moved

Cumulative Orders

When quantities complete and labor are reported, they are tracked against a cumulative order. The cumulative order enables you to track and post variances for a schedule on a periodic basis.

Cumulative orders can be closed and the WIP balances transferred to a new cumulative order to allow for changes in bills of materials (BOMs) and routings and for easy accounting period cutoffs.

Advanced Processing Activities



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Advanced Processing Activities

Repetitive activities use the Advanced Repetitive module located in the Repetitive submenu 18.22. Make sure you use this submenu and not the Repetitive menu 18.

In the following activity you:

- Set up for repetitive implementation
- Add a repetitive schedule and explode it
- Create a repetitive picklist and transfer material to the work center location
- Do repetitive transactions to report labor usage, material consumption, and completions

Setup for Repetitive Implementation

- 1 Use Work Order Maintenance 16.1 to close or delete any work orders that are firm planned or released for your parent item. (Planned work orders are OK.)
- 2 Run MRP using Net Change Materials Plan 23.1 to replan orders at your manufacturing site.
- 3 Modify the advanced Repetitive Control File 18.22.24. Make sure Enable New Repetitive field is Yes.
- 4 Use Production Line Maintenance 18.22.1.1 to add a production line where your item will be manufactured. Define the capacity per hour for your parent item and any other manufactured item you have in your product structure.
- 5 Add a second shift to your calendar using Shift Maintenance 18.22.1.22.
- 6 If you have any other manufactured items (subassemblies) in your product structure, set up the time that it takes to change the setup on the production line between manufacturing items using Line Changeover Maintenance 18.22.1.6.
- 7 If you have not already linked each of your items to an operation code, use Product Structure Maintenance 13.5 to do so now. Make sure each component has a value in the Op field equivalent to the operation code in the routing where that component is used. This will be used later when we backflush components from inventory.
- 8 Modify Item-Site Planning Maintenance 1.4.17 so the routing and BOM code to be used are referenced, even if they are the same as the item number.
- 9 Create a location code that is the same as your work center code using Location Maintenance 1.1.18. This work center location is where we will backflush material later, when we do Backflush Transaction 18.22.13.

Add and Explode a Repetitive Schedule

- 1 Review the MRP Detail Inquiry 23.16 for your parent item. Note the planned orders that have been scheduled. It may be beneficial to print this information.
- 2 Use Schedule Maintenance 18.22.2.1 to schedule these planned orders in repetitive. Divide weekly quantities into daily amounts. Add a repetitive schedule for a two-week time period.
- 3 Run the Schedule Explosion 18.22.2.4 to explode the BOM and routing for lower-level requirements. (Note: running MRP will also do this.)
- 4 Review the Operation Schedule Report 18.22.2.5 to check the schedule for your operations.

Create Repetitive Picklist/Transfer Material to Work Center Location

- 1 Check your component inventory levels using Inventory Detail by Item Browse/Inquiry 3.2.
- 2 If there are not enough component materials to report completions of the parent item in repetitive, add and receive the necessary purchase orders.
Hint: Net Change MRP 23.1, Planned Purchase Order Approval 23.11, Purchase Order Maintenance 5.7, PO Receipts 5.13.1
- 3 To calculate the amount of materials that are needed in the work center location to make one day's production, run the Repetitive Picklist Calculation 18.22.3.1. The picklist number will be incremented if you have successfully calculated a picklist.
- 4 Use Repetitive Picklist Inquiry 18.22.3.2 to review your picklist.
- 5 Use Repetitive Picklist Print 18.22.3.5 to print the picklist to a window.
- 6 Transfer your component inventory from your stocking location to your work center location using Repetitive Picklist Transfer 18.22.3.6.
- 7 Use Inventory Detail by Site Inquiry 3.3 to review the location of your inventory. It should now be in the work center location you set up in a previous task.

Report Labor Usage, Material Consumption, and Completions

- 1 Select Backflush Transaction 18.22.13 to report labor, quantities complete, and material usage by operation. For the first operation, complete the following fields:

Qty Processed: One day of production

Modify Backflush: Yes

Move Next Op: Yes

Act Run Time: Time to complete the first operation for the quantity processed

- 2 When you make the update from the first screen with Modify Backflush set to Yes, the Issue Data Input frame will appear.

This enables you to modify the amount of component materials that were issued for the quantity processed or change the location from where they are being backflushed. If a material shortage occurs, this frame will display and warn you.

Update and exit.

- 3** Use the WIP Status Inquiry 18.22.12 to review the status of the operations. Look at the input and output queues of the operations on the routing.
Make sure the BOM and Routing fields are filled in when you display the WIP status.
- 4** Reenter the Backflush Transaction 18.22.13 to report the completion of the remaining routing operations.
On the final operation, an additional frame will appear that enables you to enter the location where you put the completed assemblies.
- 5** Review the WIP Status Inquiry 18.22.12 to see how the final operations have changed.
- 6** Review the inventory for the parent item in Inventory Detail by Site Browse/Inquiry 3.3.
The inventory balance should have been increased by the amount of the last transaction.

Distribution Order Shipments and Receipts (optional)

In the following activity you:

- Set up a distribution order at your manufacturing site and ship it
- Check inventory in transit and receive the distribution order at your distribution site

Set Up and Ship a Distribution Order at Manufacturing (Supply) Site

As you do this task, keep in mind that the activities of the source site (in this case, the manufacturing site) are done in the Distribution Orders Menu 12.17.

- 1 Use Inter-site Demand Browse/Inquiry 12.17.2 to review the open inter-site demand on the manufacturing site.
- 2 Select Distribution Order Maintenance 12.17.14 to add an order that references the inter-site demand request.

For the Ship-From and Ship-To fields, use the site codes that were set up in company addresses.

Use the default header information to update the line item information.

- 3 In the Req (requisition number) field, use the look-up browse to select an inter-site demand request, update, and add another requisition number.

Update and exit.

- 4 Print distribution orders using Distribution Order Print 12.17.18. Print a picklist using Distribution Order Picklist Print 12.17.19 (optional).

- 5 Ship the distribution order using Distribution Order Shipments 12.17.22.

This transaction will actually reduce the inventory at your source site and move it to your goods-in-transit (GIT) site. Typically, the GIT site is in the receiving site.

Make sure you do not exit this screen too early.

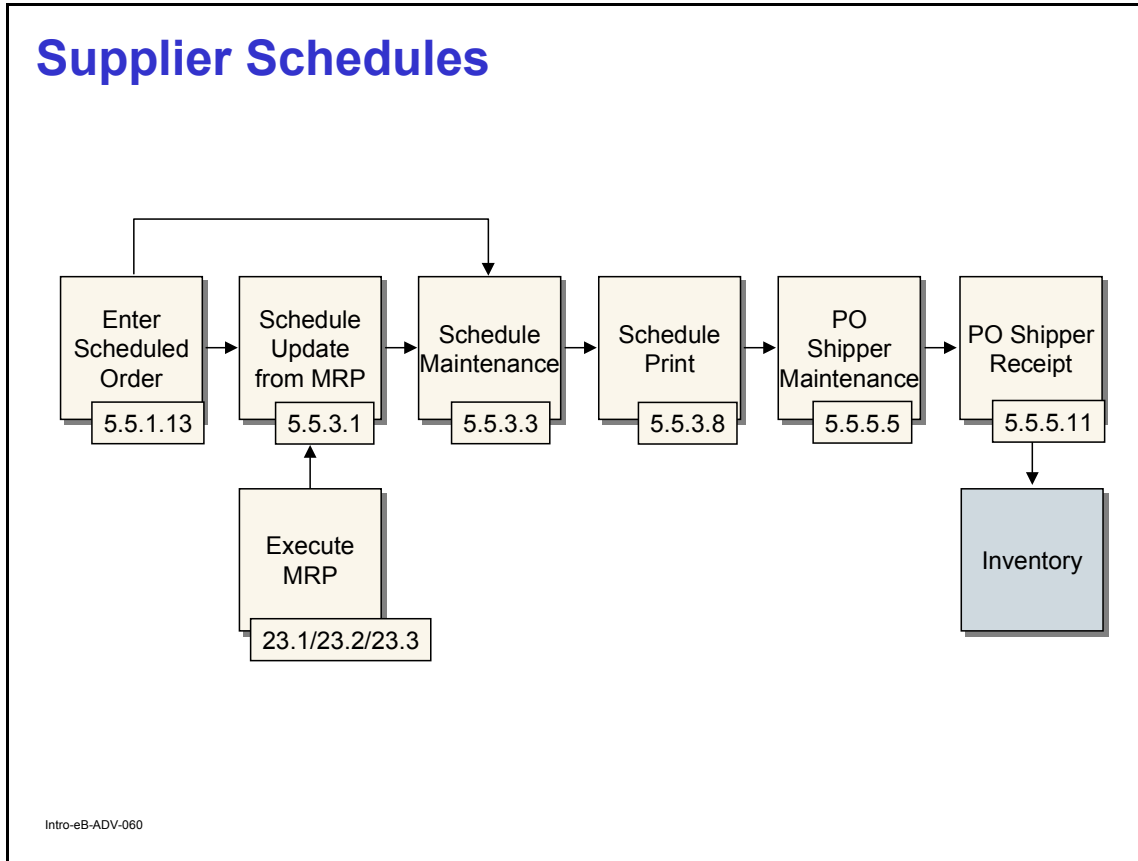
Check Inventory in Transit and Receive the Distribution Order

Instructions: As you do this activity, keep in mind that the Inter-sites Request Menu 12.15 is meant to be used by the receiving site for inter-site request processing.

- 1** Use Orders In Transit Browse/Inquiry 12.15.13 to verify that the distribution order was shipped from the manufacturing site to the distribution site.
- 2** Review your parent item inventory using Distributed Inventory Inquiry 12.15.5. Leave the site field blank.

Note that this is the only place in the system where you can view all your inventory at all sites in one frame.
- 3** Receive the distribution order using Distributed Order Receipt 12.15.20. Set the Use Shipment Information flag to Yes to automate the receipt of the order.
- 4** Repeat step 2 above.

Notice the inventory at the receiving site is now available and nettable.



Supplier Schedules

Generate from MRP

The supplier scheduling process starts with the development of a required receipt schedule. You can manually enter requirements or generate them from MRP, then modify as needed. When they come from MRP, schedule quantities and due dates are generated using the following information:

- MRP-planned orders
- MRP percent
- Transportation lead time
- Standard pack/order multiple
- Safety days

Authorizations

Supplier schedules usually also include authorization quantities: the amount of material you authorize the supplier to make or buy on your behalf, which you promise to buy.

Receiving

Schedules are printed and sent to suppliers. They in turn send you the products and an ASN (advance ship notice) that can be received via EDI (electronic data interchange). This is recorded at your end as a shipper, identifying containers and items received. The confirmation increases inventory and cumulative receipt quantities, and generates GL transactions.

Supplier Schedules – Planning Horizons

Time Fence



Schedule Buckets



Days

Weeks

Months

MRP Horizon



Weeks

1

2

3

4

5

6

7

Intro-eB-ADV-070

Planning Horizons

Receipt Schedule Not Seen by Supplier

As in Customer Schedules, the raw schedule from MRP undergoes a transformation process. You begin with MRP. This is never seen by the supplier; it is used by the system to generate the schedule. This schedule is sent to the supplier.

Schedule

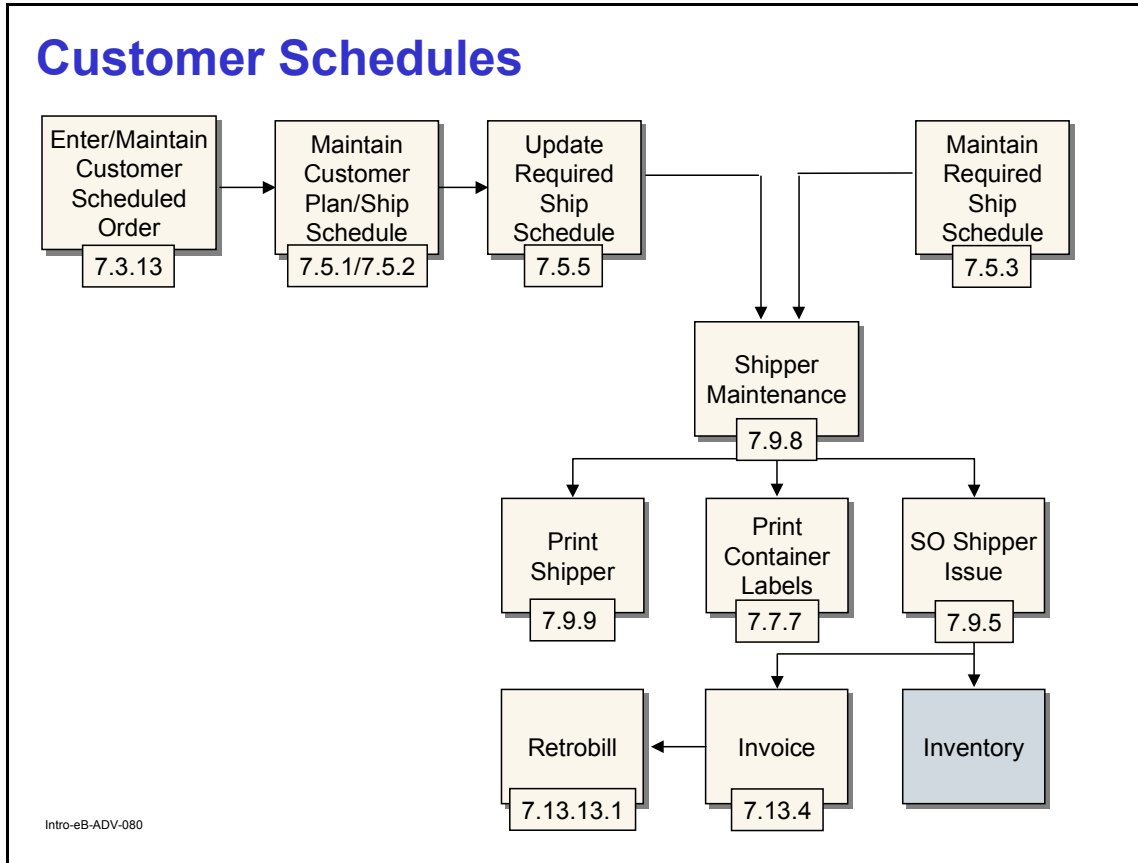
The schedule may be offset based on a receipt calendar, and the days you have agreed to receive shipments, based on the ship/delivery pattern. In the short-term, schedule requirements are expressed by day and week, followed by longer term requirements by month.

This provides long-term visibility to your supplier and enables that company to better plan for your requirements.

Multiple Releases

As with customer schedules, multiple releases of the schedule can be maintained on-line, although only one can be active at any time.

Each release is identified by a release ID. Successive releases can be compared, which is useful for identifying trends. Increasing requirements may lead you to renegotiate price.



Customer Schedules

Planning Schedules

In some environments, customers establish contracts with suppliers for delivery of products on a regular basis according to a schedule they send.

To help the supplier plan ahead, the customer often sends a planning schedule. This shows you what their anticipated requirements are over a period of time—often for the next six months or year. This feeds into your MRP.

Shipping Schedules

In the near term, customers send shipping schedules. These list exact quantities required at exact dates and times. Usually, these shipping schedules cover only the next few days or weeks. These are like sales orders; you print a packing list and ship the materials as soon as they become due.

Ship/delivery and Authorizations

Customer schedules may include special delivery instructions called ship/delivery patterns. For example, a customer may request delivery every Monday and Thursday at 8 a.m. They also may include authorization quantities—the amount of material the customer authorizes you to make or buy on their behalf and that they promise to buy.

Note Customer schedules can be sent via EDI or entered manually.

Shipping

Once you receive the customer's requirements, shipments are managed using a shipper, designating the items and containers in the shipment.

Shipping information can be communicated to the customer as an ASN (advanced ship notice).

Auto-invoicing

Shipper confirmation decreases inventory, increases cumulative quantity shipped, updates the general ledger, and generates (and optionally posts) an invoice.

If prices (costs) subsequently change, retrobilling is used to bill or credit the incremental difference.

Customer Schedule Calculation

Ship Date and Quantity Logic

	4/12	4/13	4/14	4/15	4/16	4/19	4/20	4/21	4/22	4/23
	M	T	W	Th	F	M	T	W	Th	F
1. Incoming Ship/Plan Schedule Qty: 750 Due: 4/22									750	
2. Ship/Delivery Pattern 1/2 MW						375		375		
3. Ship-To Calendar Closed 4/19 – 4/23			375/ 375							
4. Transport Lead Time 2 days	375/ 375									
5. Order Multiple 500	1000									

Intro-eB-ADV-090

Customer Schedule Calculation

Calculate Due Date

When a customer sends a new schedule, it does not feed directly into MRP. First it goes through a transformation process—Required Ship Schedule Update 7.5.5. The customer sends the quantity and the date it is due at their facility.

But you do not want MRP to look at their due date, you want it to look at your due date—the date the products must leave your shipping dock to get there on time. MRP must consider packaging quantity, ship/delivery pattern, workdays, and transport lead time.

In the example above, the steps are:

- 1** Quantity of 750 due on 4/22.
- 2** Adjust the delivery date based on the ship/delivery pattern:
 - a** The schedule is set up with 1/2 Monday and 1/2 Wednesday deliveries.
 - b** The delivery quantity is allocated into two deliveries of equal size that week.
- 3** Verify that the customer's receiving dock is open. In this case, the customer's schedule indicates that their receiving dock is not open on Monday and Wednesday. Reschedule the shipments to the previous week.
- 4** Adjust for transportation lead time. If the transportation lead time is two days, the deliveries must leave your shipping dock on Monday and Wednesday.
- 5** Check the order multiple.
 - a** They requested 750, but your standard pack quantity is 500.
 - b** Increase the order quantity to 1,000—a multiple of 500.

Advanced Processing Activities



Intro-eB-ADV-095

Advanced Processing Activities (optional)

In the following activity you:

- Set up a customer schedule and make a shipment
- Set up a supplier schedule and receive materials
- Add a repetitive schedule using Line Sequence Workbench

Set Up a Customer Schedule and Make a Shipment

- 1 Use Scheduled Order Maintenance 7.3.13 to add the basic order data for a customer-scheduled order (Ship-From is the distribution site; Ship-To is the customer address). Set Auto Invoice Post to Yes. Let the remaining header detail default from the customer master record.

Add line item detail for your parent item. Update the following:

Req Sched Days: 30

Req Sched Weeks: 4

Req Sched Months: 4

Plan SDP Code: 10 (any day Monday through Friday)

Ship SDP Code: 10 (any day Monday through Friday)

Netting Logic: 3

- 2 Manually add the required ship schedule in Required Ship Schedule Maintenance 7.5.3. Set the release number to 1 and the prior cum date to today's date.
- 3 In the schedule detail data frame, enter a daily schedule for the next five days.
- 4 Update and answer Yes to the question, Make the Schedule Active?
- 5 Use Sales Order Shipper Maintenance 7.9.8 to create a shipper. Leave the shipper number blank so the system can assign the next number. Ship a few lines of the schedule you created previously (do not ship more than you have in inventory).
When you reach the Contents (Containers) frame, use the Escape key. This will take you to the Contents (Items) frame.
This information can be printed as a document or sent via EDI to a customer as an ASN.
- 6 Use Pre-Shipper/Shipper Confirm 7.9.5 to ship the items on the shipper to the customer. Set Post Invoice and Use Shipper Nbr as Invoice Nbr to Yes.
You can print an invoice at this point or send it to the customer via EDI.
- 7 Check customer Account Inquiry 27.13 to see the invoice.

Set Up a Supplier Schedule and Receive Materials

- 1 Use Scheduled Order Maintenance 5.5.1.13 to set up the order data for the supplier schedule. On the header, let all information default from the supplier address.
- 2 Set up detail for each of your component items. Set up the following fields:
 - Schedule days: 7
 - Schedule weeks: 4
 - Schedule months: 4
 - Transport days: 2
 - Ship/Dlvy Pattern: 10 (any day Monday through Friday)
- 3 Use Scheduled Order MRP% Maintenance 5.5.1.17 to tell the system what percentage of the MRP-planned orders will be scheduled using this supplier order. We will assume 100% for all three items.
- 4 Run Net Change Materials Plan 23.1.
- 5 Update the supplier schedule based on the MRP-planned orders using Schedule Update from MRP 5.5.3.1. (Set the report detail summary/detail flag to Detail.)
- 6 Review the schedule using Schedule Inquiry 5.5.3.4.
- 7 Build the shipper using PO Shipper Maintenance 5.5.5.5. Set Shipper ID to 1. Indicate that some quantity of each item is to be received.
Update and exit.
- 8 Receive the materials into inventory using PO Shipper Receipt 5.5.5.11.
- 9 Review what was received into inventory using PO Receipt Cost Browse/Inquiry 5.13.3.

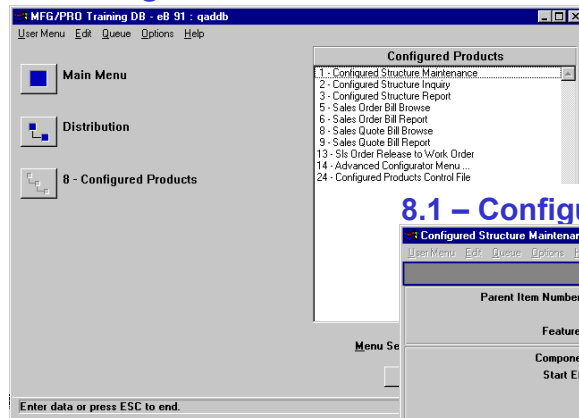
Add a Repetitive Schedule Using Line Sequence Workbench

- 1 At the manufacturing site, use Line Schedule Workbench 18.22.1.10 to review MRP-planned orders for the production line. Select several MRP-planned orders to put on your repetitive line schedule by toggling the order number with the enter key.
Update and exit.
- 2 Use Repetitive Schedule Update 18.22.1.18 to convert the calculated workbench schedule into the active working schedule.

- 3** Review the schedule using Item Schedule Inquiry 18.22.2.2.
- 4** Run Net Change Materials Plan 23.1 to explode the schedule.
- 5** Do Backflush Transaction 18.22.13 to receive your repetitive schedule.
Complete what you can with the material you have at your work center.

Configured Products

8 – Configured Products



8.1 – Configured Structure Maintenance

Intro-eB-ADV-100

Configured Structures

Configured–Not Stocked

When an end product is assembled from a variety of options, it is possible to manage order entry and production with the Configured Products module.

In a typical case, a customer order is received and the ordered item is then assembled to the specifications of the order.

Often, the configuration of the item is unique, so these configurations are not stocked. In fact, if the customer cancels the order, completed configurations are usually disassembled and the components returned to stock.

Minimize Item Numbers

Without Configured Structures, you would have to set up a different item number and product structure for each possible configuration. With Configured Structures, you define basic components as items—the product, its options, and its accessories—then relate them in one product structure.

Configured structures can be multilevel; that is, components in a configured structure can also be configured.

Configured items are identified in Item Master Maintenance 1.4.1 as Pur/Mfg code C.

Feature Groups

In a configured structure, related options or accessories are grouped under a feature code.

Features can be designated as mandatory or non-mandatory. A car may have the features Engine Type and Accessories—an engine would certainly be mandatory but add-on accessories such as air conditioning or stereo equipment would be non-mandatory.

Within each feature group, one or more items may be designated as default options. For example, the default engine type may be a six-cylinder. A diesel engine could be another option, but it is not the normal choice, so it would not be set up as a default.

The configured item, made up of its mandatory and default options, would be referred to as the standard bill.

Planning Order Entry

8.1 – Configured Structure Maintenance

Configured Structure Maintenance

User Menu Edit Queue Options Help

Parent Item Number: 10-10000 Rev: AB UM: EA
 OASIS(TM) COOLING SYSTEM HOME/INDUST MOI
 Feature: MOTOR Mandatory: yes

Component Item: 66-100 MOTOR,440AC3PHASE
 Start Effective: / /

Qty Per: 1.0 EA Structure Type: 0
 Scrap: 0.00% Rev: AA
 Forecast: 100.00%
 Default Option: yes
 LT Offset:
 Op:
 Start Effective: / /
 End Effective: / /
 Sequence Number:
 Remarks:

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

- ◆ Quantity Per
- ◆ Forecast %
- ◆ Mandatory
- ◆ Default

Intro-eB-ADV-110

Planning Order Entry

Forecast Percentage

Each component in the configuration can be assigned a forecast percentage to indicate the percentage of completed configurations that usually have this component. For example, 40% of the cars you sell may have air conditioning, while 25% have cassette tape players. The forecast for cars is used by planning to generate a production forecast for these options.

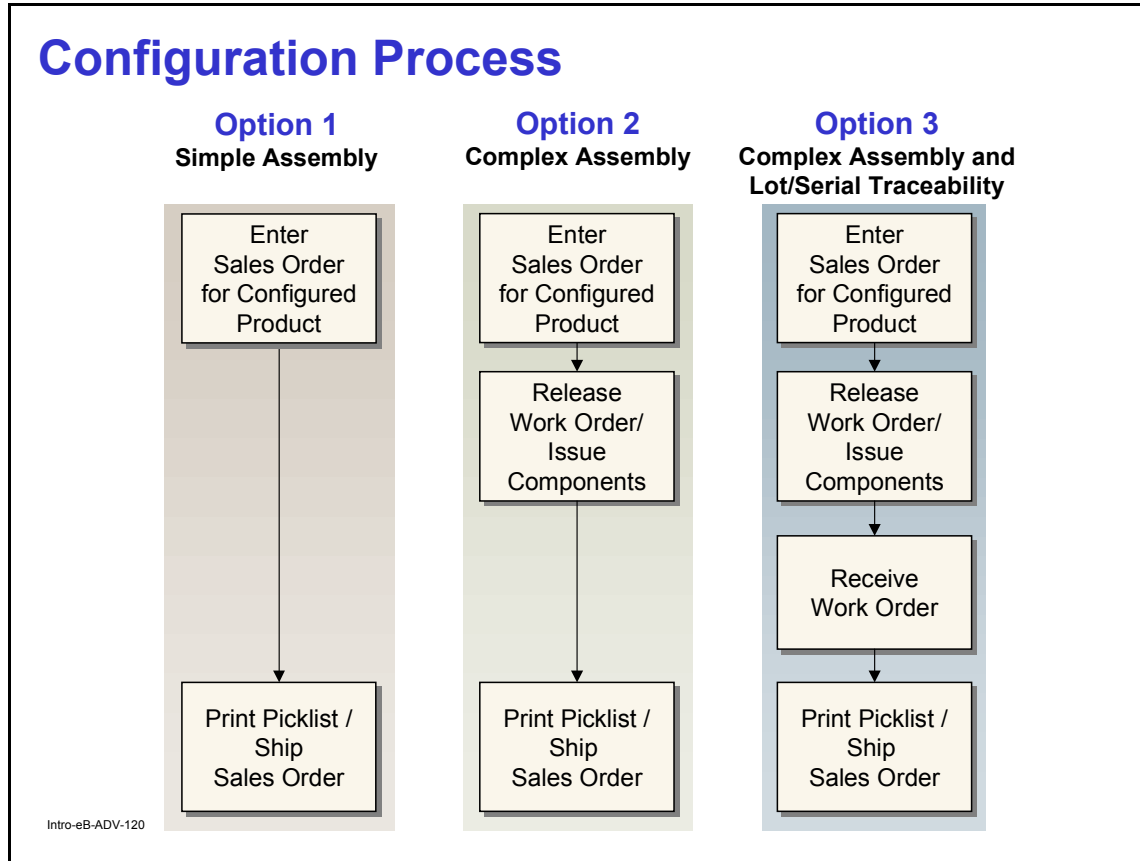
Mandatory/Default

Whenever an order (or quote) is entered for a configured product, you can choose the standard configuration. This includes the mandatory and default items.

If you do not choose the standard model, the system opens a list of features and prompts you to make selections for each one. Quantity, price, and discount are entered for each selected item. This generates a product structure, unique to this sales order line, called the sales order bill.

Work Order Release

Typically, final assembly work orders (work orders for the assembly step) are generated from a sales order once it is confirmed. The components to be used on this work order are taken directly from the sales order bill. The work order number is the sales order and line item number.



Configuration Process

How sales orders and work orders are processed largely depends on the complexity of the assembly process and whether or not items are serial-number controlled. This is defined by settings in the Configured Products Control File 8.24.

Processing Options: Easy Assembly—No Serial Number

The simplest process is very short and items are not serialized. No work order is used. A sales order picklist is printed to identify items to be assembled. When assembly is complete, a sales order shipment is processed and components are issued (backflushed) from stock based on the sales order bill.

Processing Options: Complex Assembly

If assembly requires several complex operations or takes a long time, a work order may be needed to manage the assembly process.

A work order is generated and released, and components issued to this work order. The finished item is not received into stock, but shipped as soon as completed. The sales order shipment records the work order receipt and closes the work order.

Processing Options: Serial Number Control

When a configured product is serial-number controlled, not only do you release a work order for the final assembly, you also receive the finished item into stock. That item is then shipped on the sales order.

This ensures complete lot/serial traceability of the assembled item and its components, but requires an extra step.

Post to Installed Base

When a configured item is shipped, the actual configuration shipped can be passed to the Service/Support module and recorded in the installed base. This records the items along with their serial numbers (if any). Non-configured items can also be posted to the installed base, but only if transaction history work orders exist.

Note Service and Support Management is covered in more detail in the optional Service and Support Management chapter.



Course Overview

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ Set Up and Use MFG/PRO eB
 - ✓ Planning Systems
 - ✓ Advanced Processing
 - Accounting Systems

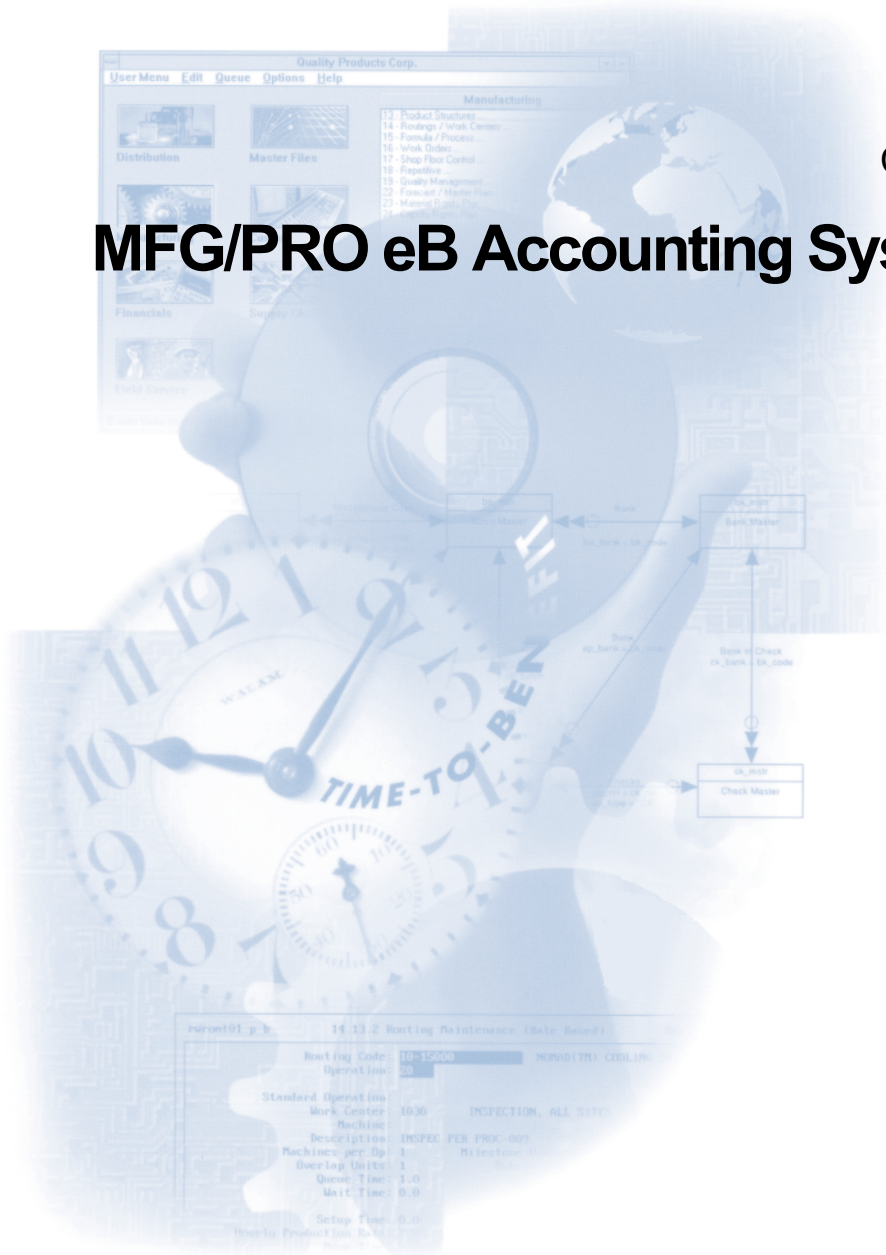
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What's next?

The MFG/PRO eB functions covered so far have a financial impact—some on company costs, others on cash—and most create GL transactions. The next chapter covers MFG/PRO eB accounting systems.

CHAPTER 8

MFG/PRO eB Accounting Systems





Accounting Systems in MFG/PRO eB

In this section you learn how to:

- ✓ Introduction
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ **Set Up and Use MFG/PRO eB**
 - ✓ Planning Systems
 - ✓ Advanced Processing
 - ✓ **Accounting Systems**

Intro-eB-Accctg-010

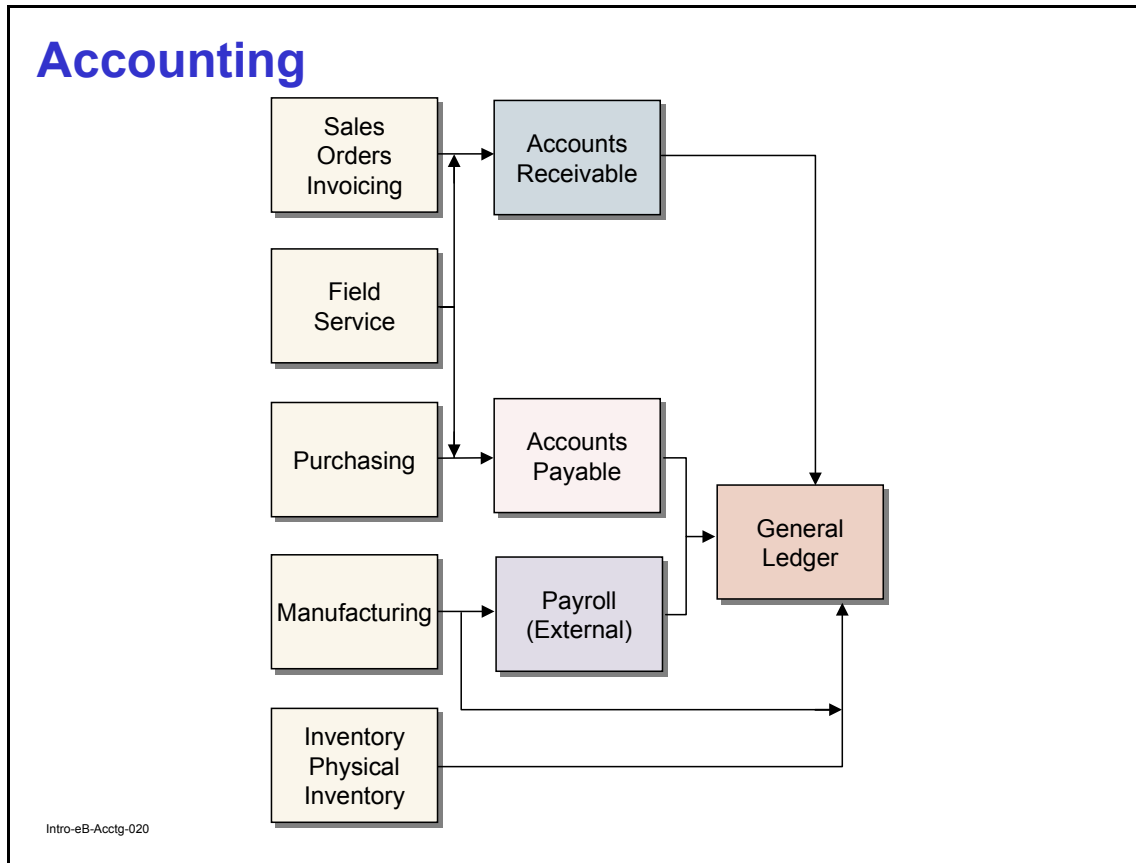
Accounting Systems

In this chapter, we discuss the accounting modules of MFG/PRO eB—how they are integrated with each other, and how they are affected by activities throughout the system.

When we are done, you should have a well-rounded understanding of MFG/PRO eB from a planning, operational, and financial point of view. You should also be able to answer the following questions:

- What happens when an invoice is posted?
- How is customer credit managed?
- How are payments processed?
- What is three-way matching, and how does it operate?

- How are suppliers paid?
- How can you determine your cash position?
- How are bank statements reconciled?
- When and where are GL transactions created?
- How are these processed?
- What reports are available?
- How are multiple currencies supported?
- What is unrealized and realized gain/loss?



Accounting Overview

Balance Sheet and Income Statement

In accounting, the goal of an integrated manufacturing, distribution, service, and financial management system is to produce financial statements, that is, a balance sheet and income statement.

Financial statements define the activities of a company because most of the information in them is generated by these activities.

Sales and Accounts Receivable (AR) Effects

When products are shipped and invoiced, the invoice is passed to AR for collection. This updates the customer's open account balance and creates a GL transaction for AR and Sales.

When the customer pays, another GL transaction is recorded to decrease AR and increase Cash.

Purchase Orders and Accounts Payable (AP) Effects

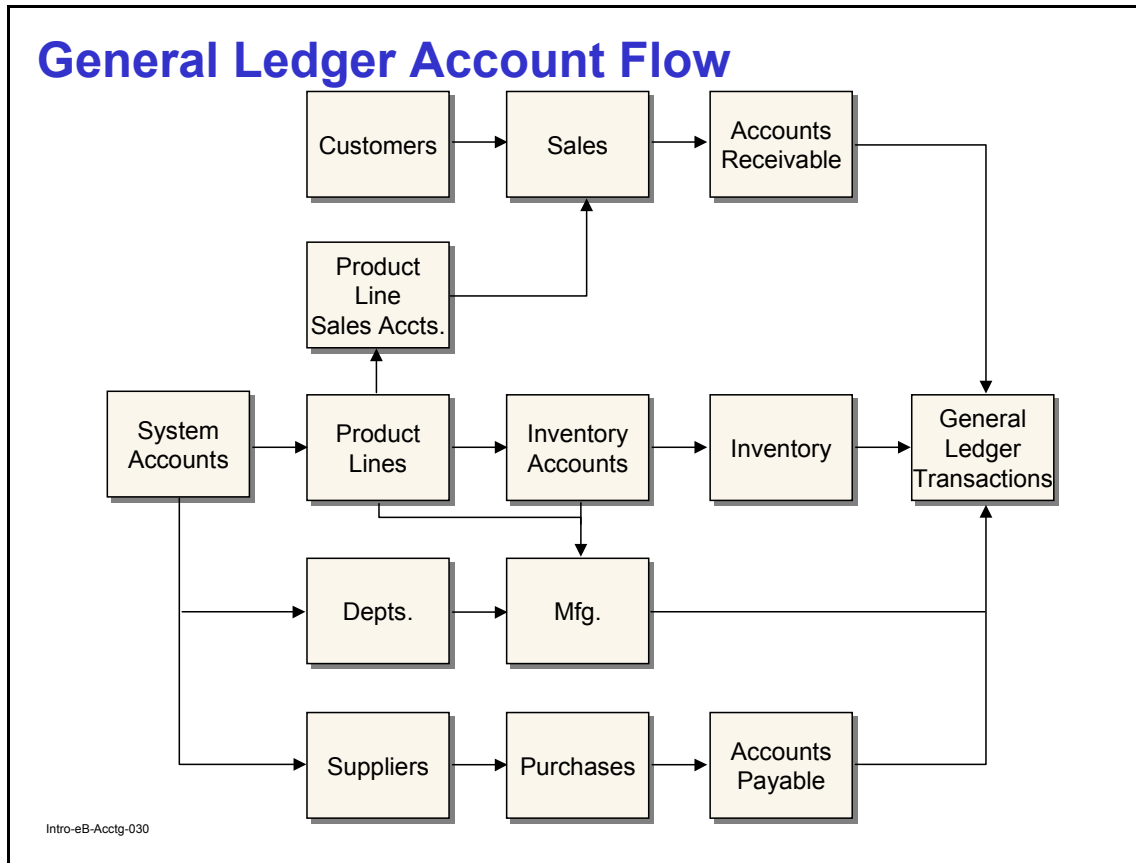
AP transactions affect the balance in AP, Cash, Purchase Accruals, and other expense accounts.

Purchase orders do not update AP. They are used only for verifying the supplier's invoice as it is entered.

Inventory Control (perpetual vs periodic)

Inventory transactions can also generate GL transactions, keeping a running balance in the inventory account. This is called perpetual inventory accounting.

Most companies use this, but it can be turned off in the Inventory Control File 3.24 if your company uses the periodic method of inventory accounting instead.



General Ledger (GL) Account Flow

Account Defaults

GL accounts occur in a variety of places. If set up correctly, you will not have to enter the GL accounts on most transactions. The correct ones are brought in as the default, speeding up data entry and minimizing errors.

Defaults are set up in the System/Account Control File 36.1. A few accounts are used directly, but most account defaults flow through the system.

36.1 to 2.1.1 to 7.1.5

- Accounts Receivable
 - The receivables account displays on each new customer, but can be changed
 - The customer AR account is passed to sales orders, but can be changed on the orders
 - The AR account on the order is the one affected by invoicing

36.1 to 1.2.1 to 1.2.17

- Sales
 - Similarly, the sales account can be set up with defaults by product line, or even by site, channel, and/or customer type
 - The sales account can be changed on each sales order line

36.1 to 1.2.1 to 1.2.13

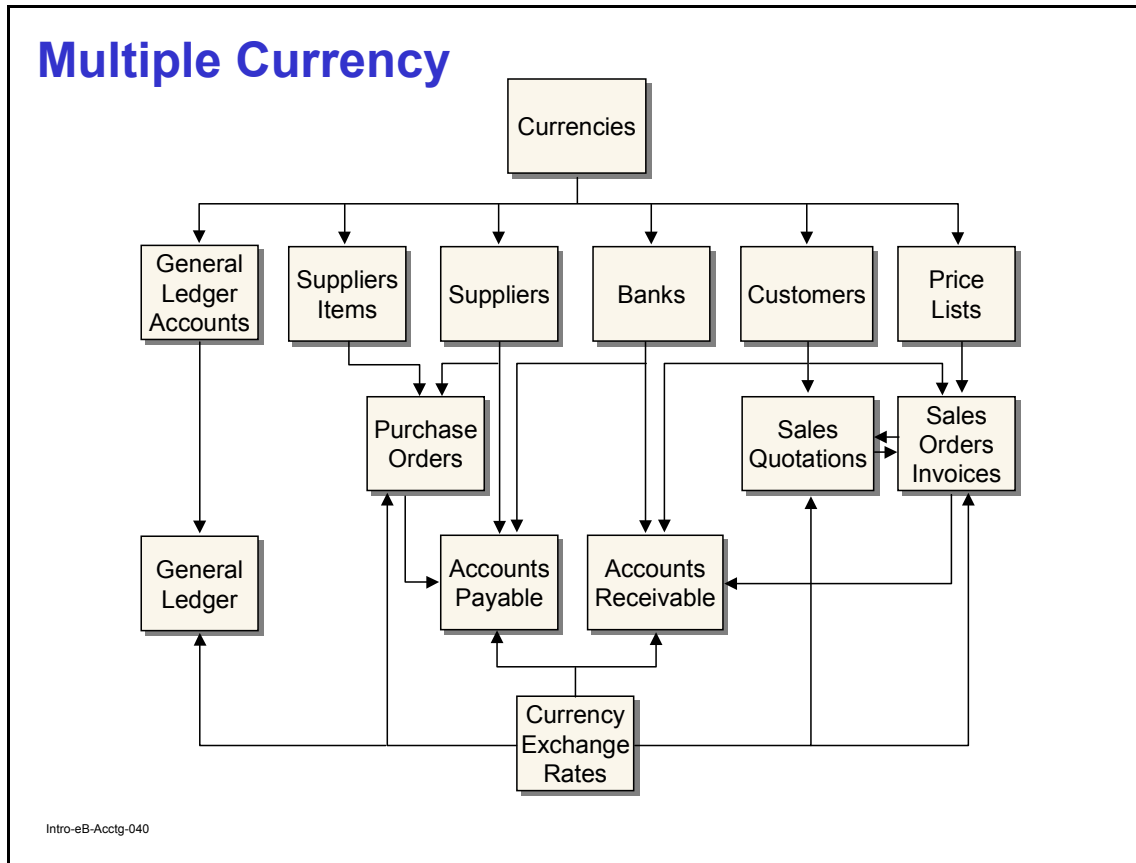
- Inventory
 - Default inventory accounts are set up in the System/Account Control File 36.1, but can be changed by product line and site
 - All inventory activities and cost changes use the product line and site accounts

36.1 to 1.2.1 to 14.1

- Manufacturing
 - WIP, expense, and variance accounts are established in the System/Account Control File 36.1 and can be changed by product line and department
 - The latter are accessed by manufacturing orders
 - Some accounts can be changed on each order

36.1 to 1.2.1/2.3.1 to 5.7

- Accounts Payable
 - AP, purchase expense, and accrual accounts are set up in the System/Account Control File 36.1, but are optionally modified by product line, supplier, and purchase order.



Multiple Currency

Non-base Amounts

An amount anywhere in the system can be expressed in terms of any currency. The default, of course, is that you perform all activity in your base currency.

However, this can be changed on any transaction. The only amounts that must be expressed in your base currency are costs—inventory cost, work center labor rates, and payroll rates.

Addresses and Orders

Each of the currencies you use must be predefined in Exchange Rate Maintenance 26.4. Once defined, specific customers and suppliers can be assigned the currency in which you do business with them. Pricing and supplier quotes can be set up by currency as well.

When sales quotes, sales orders, and purchase orders are recorded, they automatically reference the appropriate currency and access prices based on that currency. This information is passed along to AR and AP when orders are invoiced.

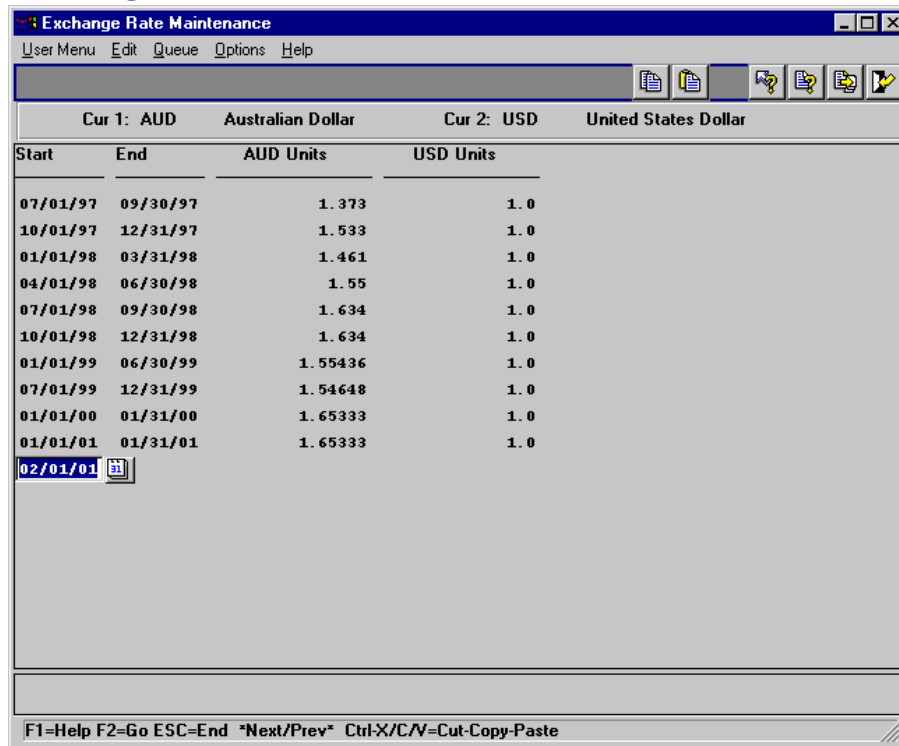
Banks and GL Accounts

Bank accounts can be maintained in different currencies, enabling you to process payments and maintain cash balances in any of the currencies in which you do business.

This is supported by the ability to maintain GL accounts in a different currency—you can set up a GL cash account for each currency. Account balances can be reviewed in that currency, but they are always converted to base when printing financial reports.

Any GL asset or liability account can be maintained in non-base currency.

26.4 – Exchange Rate Maintenance



Start	End	AUD Units	USD Units
07/01/97	09/30/97	1.373	1.0
10/01/97	12/31/97	1.533	1.0
01/01/98	03/31/98	1.461	1.0
04/01/98	06/30/98	1.55	1.0
07/01/98	09/30/98	1.634	1.0
10/01/98	12/31/98	1.634	1.0
01/01/99	06/30/99	1.55436	1.0
07/01/99	12/31/99	1.54648	1.0
01/01/00	01/31/00	1.65333	1.0
01/01/01	01/31/01	1.65333	1.0
02/01/01			

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Acctg-050

Exchange Rate Maintenance

Menu Number 26.4

Effective Rate

The most important question in using multiple currencies is:

- What exchange rate does the system use?

Exchange rates are set up in Exchange Rate Maintenance 26.4. Rates are entered for a range of effective dates—daily, weekly, monthly, quarterly, annually. Whenever a transaction is entered in that currency, the system goes to this rate table and looks up the rate effective on the date of the transaction.

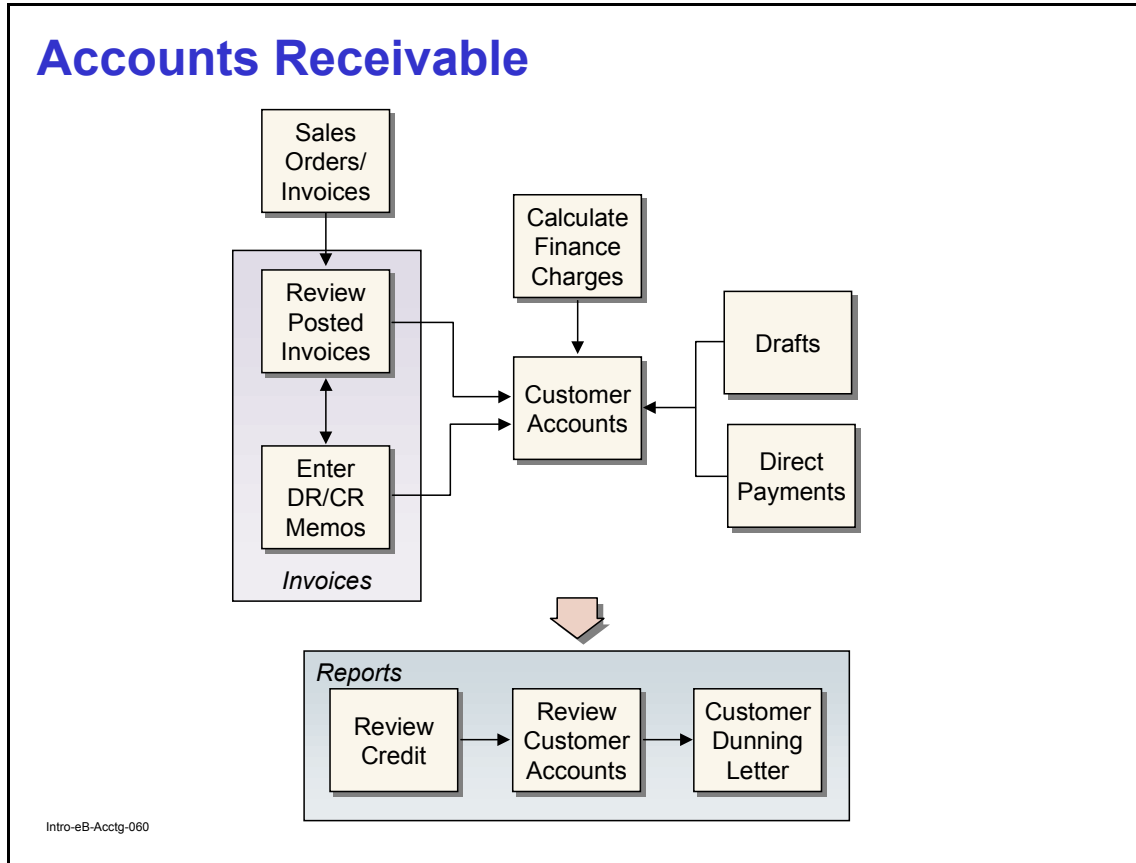
Enter Spot (Optionally Fixed)

The effective rate can always be changed to a spot rate, the rate to be used on that transaction. On sales orders and purchase orders, the spot rate can be designated as fixed.

Usually, the exchange rate used on a sales order (purchase order) is picked up when the order is invoiced (received). Then this rate is used to calculate unrealized gain/loss (and variances). However, if the exchange rate is designated as fixed, it is not changed. The fixed rate is used throughout the process.

Report Base or Transaction Currency

Each foreign currency order or transaction records the currency and the exchange rate. This is maintained along with the equivalent base currency amount. Reports can be printed in the foreign currency or in the base currency.



Accounts Receivable (AR)

Balance by Bill-To

AR functions are used to keep track of balances owed by customers. All customer balances are maintained under the customer Bill-To address. Balances are updated by:

- Posting an invoice from the Sales Orders/Invoices module
- Entering a Dr/Cr memo for non-sales related activities, credits, or refunds
- Calculating finance charges on outstanding account balances
- Processing payments in AR or the Cash Book function
- Approving a customer's draft

Contested and Credit Comments

Customer balances can be maintained in any currency and reviewed in that currency or base. Credit management functions access this balance and on-line payment history (number of days to pay, average days paid late, and high credit amount).

Any individual invoice or memo can be flagged as contested, indicating there is some dispute regarding the amount or terms. Comments can be associated with any open item.

Customer Statements

Customer statements can be printed using Customer Account Statement Print 27.14. The statement lists all open invoices, memos, finance charges and payments. The Statement flag must be set to Yes in Customer Maintenance 2.1.1.

Dun Letters and Holds

Dunning letters can be generated automatically for past-due balances, with different letters produced based on the number of days past due. Open orders can automatically be placed on hold.

The letters are written in master comments (using Master Comment Maintenance 1.12) and can be different, depending on the number of days the customer is overdue.

Customer Statements

Quality Pencil Company 9000 World Way Suite 101 Los Angeles, CA 89000 U.S.A.				STATEMENT Print Date: 12/31/93		
Bill To: 1001000						
CENTURY HALLMARK ATTENTION: ACCOUNTS PAYABLE 3020 CENTURY BLVD P.O. BOX 675 LOS ANGELES, CA 89000 U.S.A.						
Date	Reference	Type	Due Date	Amount	Amount Open	Cur
05/04/99	9100005	Memo	06/03/99	5,000.00	0.00	USD
09/06/99	10000	Invoice	10/06/99	20,725.00	20,725.00	USD
10/01/99	158002	Payment		-5,000.00	0.00	USD
Total Amount Open:					20,725.00	
Payments Unapplied:					0.00	
USD Total:					20,725.00	
Total Contested:		0.00				
Current: Past Due 1		Past Due 30	Past Due 60			
0.00		0.00	0.00	20,725.00		
*** Thank You For Your Business ***						

Intro-eB-Acctg-070

AR—Customer Statements

Statement Cycle

A complete statement of account can be produced on a regular basis for each customer, listing open items only or a complete history of their account activity since a given date.

Open items have a nonzero amount open. Customer Account Inquiry 27.13 is useful for reviewing this information on your screen.

Reference Code

Each invoice, memo, payment, finance charge, and draft is identified by a reference code. On invoices, this is equal to the invoice number. On memos, payments, and drafts, it is the number you entered when you recorded the item. Often, this is simply set to the next sequential number, as for finance charges.

Type Code

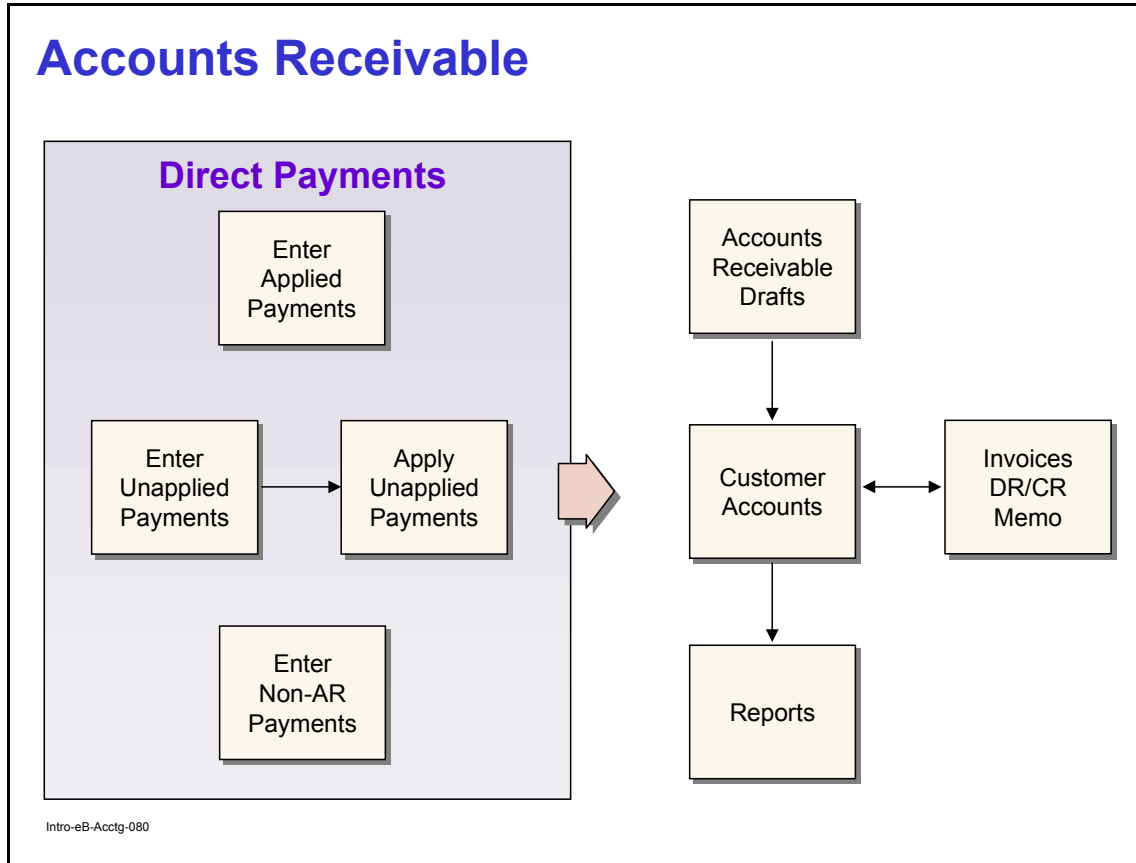
In AR, all items affecting a customer's balance are stored in the same file, identified by type: I, M, F, P, D, or A. These identify invoices, Dr/Cr memos, finance charges, payments, drafts, and payment applications respectively.

Dates

Each invoice and memo has both a due and a discount date. These are calculated automatically based on the credit terms.

You can also enter an expected date. This is used by cash flow projections as the date you really expect to see the money, often different from the due date.

Each AR transaction can also specify an effective date, which, as it does everywhere else in the system, indicates what fiscal period this transaction will be applied to (useful at period end).



AR–Direct Payments

All cash received from a customer should be recorded in either AR’s Payment Maintenance 27.6.4 or Cash Book Maintenance 31.13 as:

- Applied Payments
 - Payments applying to specific invoices, memos, finance charges, or open draft amounts
- Unapplied Payments
 - Payments that do not apply to specific invoices or memos, such as:
 - Prepayments
 - Deposits
 - Overpayments

- Non-AR Payments
 - Payments received for which no invoice or memo was (or will be) recorded, such as tax refunds and rebates

Auto Apply

In most cases, customer payments apply to an open invoice or memo item. To make it easier, there is an Auto Apply option in Payment Maintenance that automatically applies the amount received to open balances, oldest first, calculating any discounts the customer was eligible for. (You can enter a range of reference numbers.)

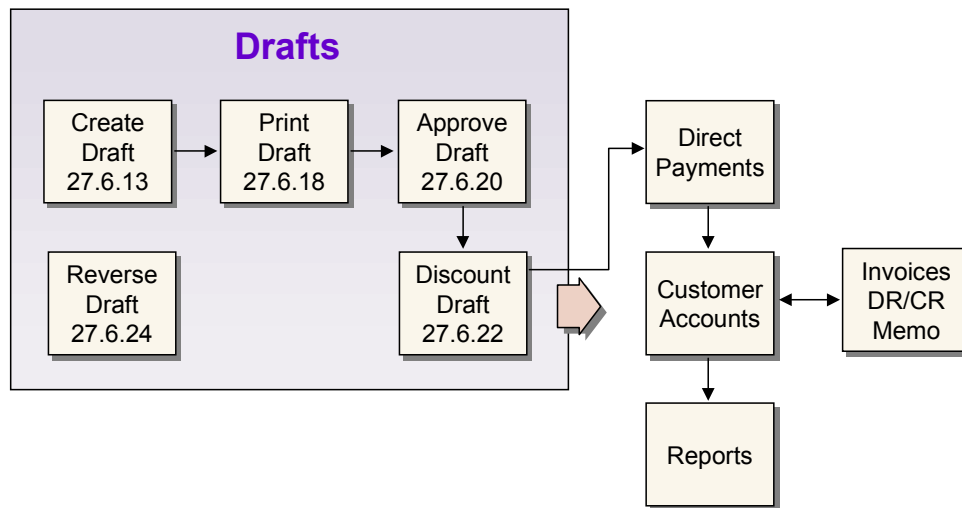
This option recommends a selection, which you can then modify.

Apply Unapplied

Sometimes a payment is received that does not correspond to any open invoices or memos, a deposit or overpayment, for example.

These are recorded as unapplied. They decrease the customer's balance, but do not affect the open balance on any open invoice or memo. Later, when you find out what items the payment applies to, the payment can be applied.

Accounts Receivable



Intro-eB-Acctg-090

AR-Drafts

Draft Approval

Payments can also be processed via a draft, which can be described as a highly negotiable promissory note. Like a promissory note, a draft is a promise to pay on a certain date and can be sold to a third party, usually at a discount.

A draft simply lists a group of open items that it will pay. This may be initiated by you or the customer. Usually, the draft is printed and sent to the customer or the customer's bank for approval. Once approved, it becomes a promise to pay.

Recording the approval closes the invoices and memos listed on the draft. The draft itself remains as an open item (Draft Receivable).

Discount and Payment

A draft may be sold to a third party, usually the customer's bank. This is called discounting, since the bank gives you the money, less a discount (or fee). Although you get the money, the draft remains on your books as a contingent liability in a bank clearing account until the customer pays the bank.

Once payment is received, record it as you would any other in Payment Maintenance 27.6.4. This closes the draft and removes your liability to the bank. Should a customer default, the draft is reversed and the items it paid are reopened.

Factoring

Factoring is a process by which a company can convert its receivables into cash by assigning them to a factor (usually a bank or finance company) either with or without recourse.

With recourse means if the receivable turns out to be uncollectable, the factor can return it to the company and get back the cash they originally paid the company.

Without recourse means the factor assumes the risk of any losses on collections.

Use Drafts to Factor

Draft Management functions can also be used when factoring your accounts receivable. If the factoring is nonrecourse, you simply record the payment immediately.

Accounting Systems Activities



Intro-eB-Acctg-095

Accounting Systems Activities

In the following activity you:

- Review a customer account and apply a payment to an outstanding invoice
- Process an unapplied payment

Review a Customer Account and Apply a Payment

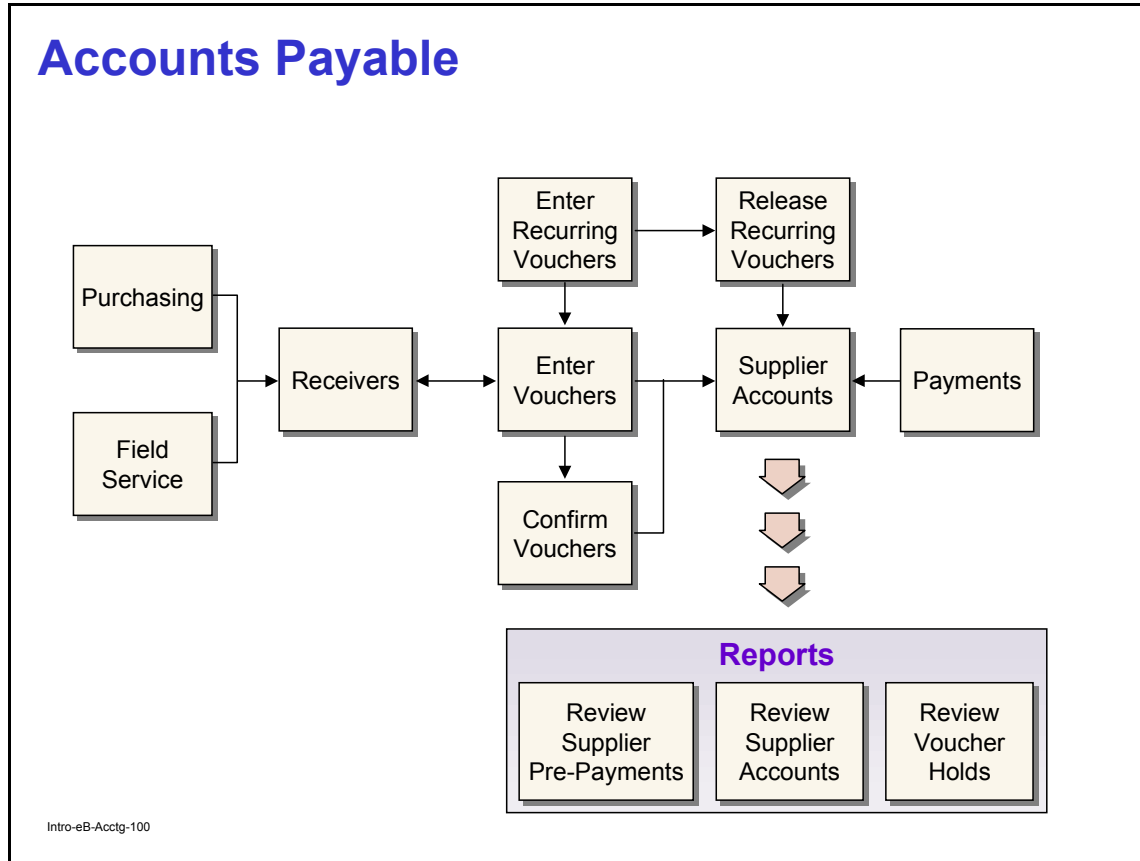
- 1** Choose one of your customers to whom you made shipments. Use Customer Account Inquiry 27.13 to see the customer's open account balance. (Turn on menu substitution to use the inquiry instead of the browse function.)

Notice the type is I for invoice and the reference is the invoice number. Choose one invoice for the remaining steps.
- 2** Use Customer Credit Review/Update 27.10 to modify the expected date for the invoice. Also, enter comments related to the expected date. These comments can be printed on aging reports.
- 3** Use AR Aging by Due Date Report 27.16 to determine if your customer account is past due on any invoices.
- 4** Your customer has sent you check number ZZ123 for a partial payment against the invoice. Use Payment Maintenance 27.6.4 to apply the payment to the invoice. The value in the check control field should be the amount of the payment you want to apply.

For example, if the invoice is for \$100.00, enter a payment of \$25.00 where the check control field is set to \$25.00.
 - a** Make sure you are using the bank you set up at the beginning of the class.
 - b** Set Auto Apply to Yes; a selection criteria screen appears.
 - c** Leave the selection criteria fields blank and press the Go key; a list of the open items for this customer comes up.
 - d** Use the Enter key to toggle (select/deselect) the items you are going to apply the payment to.
 - e** Once the items have been selected, press the Go key.
 - f** Modify the cash amount to match the amount on the check (check the control field for this item).
- 5** Review the Customer Account Inquiry 27.13. Notice the payment is type P and the payment is pegged to the invoice.
- 6** Using DR/CR Memo Inquiry 27.2, review the activity against the invoice.

Process an Unapplied Payment

- 1** In some cases, a customer will send a check without reference to an invoice. In these cases, you create an unapplied payment to record receipt of the payment.
Once the invoice information is received, the payment is applied to the correct invoice.
 - a** In Payment Maintenance 27.6.4, create an unapplied payment for check ZZ456. In this case, do not set Auto Apply to Yes when prompted for the reference—leave it blank.
 - b** You are then asked what type of payment you are making; enter U for unapplied.
- 2** Check Customer Account Inquiry 27.13 to review the status of the customer's account.
The unapplied payment will be recorded as type P and the amount of the payment will be shown as negative in the Open Amount column, indicating it is a payment or credit against the customer's account.
Note the reference number of any open invoice that can offset or be applied to the payment.
- 3** In Unapplied Payment Application 27.6.9, apply the payment to the invoice noted in the previous step. (The application of an unapplied payment ties the receipt of a payment to an invoice.)
 - a** Let the system assign the reference number for the application transaction. Use the reference number of the original unapplied payment record created in step 1 above.
 - b** Now, enter the reference number of the invoice you noted in step 2 to complete the application of the payment.
 - c** Review Customer Account Inquiry 27.13 again.
 - d** The application is shown as type A and the open amount is now 0 on both the original payment and the application.
- 4** Review the unposted AR transactions you created in this exercise using AR-GL Transactions Report 27.21. We will post these transactions to the General Ledger (GL) in a later exercise.



Accounts Payable (AP)

How Balances Change

AP functions are used to track the balances you owe to suppliers. AP functions are very similar to AR functions, although some details involved in preparing payments are different. Balances are updated by:

- Entering a confirmed voucher (debit or credit)
- Confirming an unconfirmed voucher
- Releasing a recurring voucher that is confirmed
- Processing payments or voiding checks

Any Currency

Supplier balances can be maintained in any currency and reviewed in that currency or base.

Confirmed Flag

Many companies prefer to record the invoice for an item as soon as it is received, even if confirming paperwork and approvals have not yet been received. This helps prevent loss and eases tracking.

A voucher entered as unconfirmed does not affect your supplier balance and cannot be paid until it has been confirmed. Most reports and inquiries give the option of including unconfirmed vouchers.

Note that:

- No GL transactions are created until vouchers are confirmed
- Nothing can be edited in the voucher that would affect GL transactions after it is confirmed

Voucher and Supplier Hold

If a voucher is confirmed, but disputed, it can be flagged as on hold and included in the supplier balance but cannot be paid until the hold is removed.

Hold amounts can be excluded from aging reports.

If all payments to a supplier are to be held, you can put the supplier on hold. Any new vouchers are automatically put on hold.

Accounts Payable Variances

Purchase Order No. 0001		
<u>Quantity</u>	<u>Price</u>	<u>Total</u>
10	\$10	\$100

Item GL Cost = \$8



PO Receipt

DR Inventory	80
DR PPV	20
CR PO Receipts	-100

Invoice No. 0500		
<u>Quantity</u>	<u>Price</u>	<u>Total</u>
11	\$8	\$88

Voucher Maintenance



DR PO Receipts	100
DR AP Usage Variance (1 x \$8)	8
CR AP	88
CR AP Rate Variance (\$2 x 10)	20

Intro-eB-Acctg-110

AP–Variances

PO Accrual

When items are received on a purchase order, an accrual amount is booked. It balances the increase in inventory with the increase in the accrued liability. This accrual is a liability for items received but not yet invoiced. It balances the increase in inventory on the balance with the increase in the accrued liability.

When the invoice is received, it is necessary to reference the original PO so that this accrual is reversed.

Rate or Usage Variance

When you enter a voucher and reference a PO number, the system retrieves the:

- Supplier
- Terms
- Receiving information

The latter includes the purchase price and quantities of items that have been received (or returned).

As you select receivers for vouchering, you enter the invoice quantity and invoice cost. This is compared to the actual quantity received and the original PO cost and any variance is displayed.

If you continue, the variance between the invoice cost and purchase order cost for inventory and subcontract items is posted to AP Rate Variance.

Any variance between quantity received and quantity vouchered is posted to AP Usage Variance.

Variance amounts are automatically placed on hold.

Prepays, Taxes, Rent

Not all vouchers reference a purchase order. For example, vouchers can be entered for miscellaneous items such as rent, salesperson commissions, or prepaid taxes.

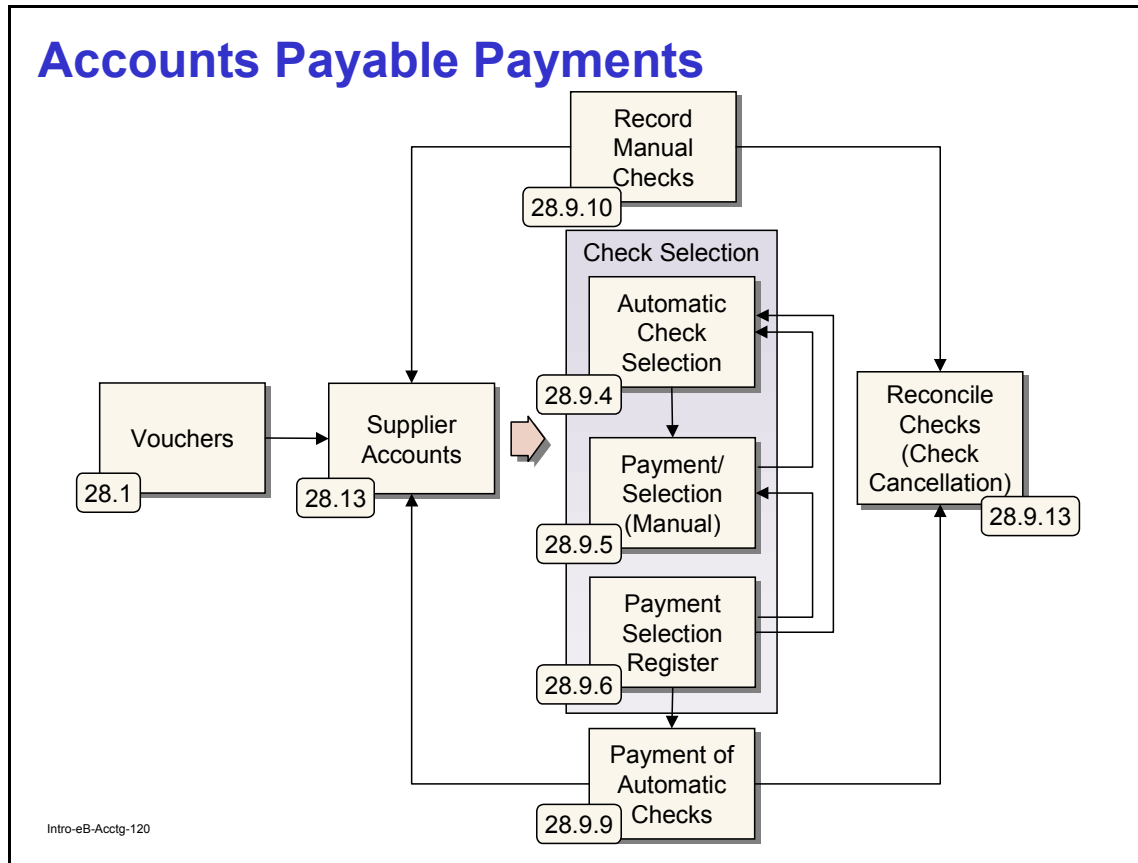
A special situation is prepayments, which are entered and paid as any other voucher but, unlike other vouchers, update the supplier prepayment balance.

Later, when you record the supplier invoice, you can apply this prepayment to that invoice and decrease the supplier's prepayment balance.

The system warns if there is an outstanding prepayment amount.

Evaluated Receipts Settlement (ERS)

ERS lets a company create automatic vouchers for selected suppliers, sites, and items. After an item is received, the ERS processor is run and vouchers are created for the receivers that fit the ERS criteria. This enables faster, more accurate processing of the supplier payment but should only be used when pricing and supplier performance is stable and reliable. ERS enables you to create unconfirmed and adjust before confirming.



AP-Payments

All cash paid out should be processed using AP functions. This ensures that a complete audit trail of all cash activity is maintained for Cash Book purposes.

There are two different types of payments: manual and automatic.

Manual Payments

Payments that have been processed manually and then recorded usually represent handwritten checks or bank transfers.

Manual payments can be for specific open vouchers or they may be non-AP payments (processed only when no voucher has been or will be entered).

Prepayments or cash on delivery (COD) amounts are not entered as non-AP payments. For these, a voucher is entered and then paid.

Automatic Payments

These are system-generated payments for specific open vouchers.

Discounts are automatically deducted for all payments made within the discount period. They are taken only on the portion of the invoice that is discountable; usually discounts cannot be taken on freight or taxes.

Automatic payments have the following standard forms, depending on the check form specified on the supplier file:

- 1** Check Forms 1 and 2 are printed checks with different print formats.
- 2** Check Form 3 generates a printed report to fax to the bank.
- 3** Check Form 4 generates an ASCII file that can be sent to the bank electronically.
- 4** Check form 5, 6, 7 are for AP drafts.

A payment specification report can be generated and sent to each supplier as a notification of payment.

Payment Selection

28.9.4 – Payment Selection - Automatic

Payment Selection - Automatic

User Menu Edit Queue Options Help

Due Date: / /

Disc Date: / /

Supplier:

Supplier Type:

Sort Name:

Voucher: 9110

Voucher Type:

Credit Term:

Bank:

Entity:

Batch:

Check Form:

To: / /

To: / /

To:

To:

To:

To: 9130

To:

To:

To:

To:

To:

Assigned Bank: AA

Assigned Check Form:

Maximum Amount: 1,500.00

Overwrite old selection: no

Check Date: 01/16/01

used to calculate discounts

Output:

Batch ID:

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy Ctrl-V=Paste

28.9.5 – Payment Selection - Manual

Payment Selection - Manual

User Menu Edit Queue Options Help

From Voucher: 1000

To Pay Only: no

Supplier:

Check Date: 01/16/01

Voucher	Supplier	Amount	Amount to Pay	Disc to TakeBk	Cl
9100001	5001000	1,000.00	1,000.00	0.00	AA
9100002	5001000	2,500.00	2,500.00	0.00	AA
9100003	5004000	15,500.00	15,500.00	0.00	AA
9100004	5004000	6,500.00	6,500.00	0.00	AA
*9100005	6002000	6,000.00	6,000.00	0.00	CC
*9100006	6002000	8,000.00	8,000.00	0.00	CC
9100007	5011000	10,500.00	10,360.40	211.60	AA

Voucher

Supplier

Amount

Amount to Pay

Disc to TakeBk

Cl

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Acctg-130

AP–Payment Selection

Payment selection consists of a standard set of steps, as we saw in the last graphic. Vouchers are selected for payment, a selection register is printed and approved, and checks are printed.

The most important steps are the automatic and manual selection functions, used to determine the outstanding vouchers to be paid.

Unlimited Funds

If funds are unlimited, use automatic selection and select all vouchers due to be paid within a certain amount of time or those that would qualify for an early payment discount if paid today.

Shortage of Funds

If there is a shortage of funds, other selection criteria may be useful. For example, you can select vouchers for payment based on supplier type or voucher type (paying off your raw material suppliers first, for example).

Then, if you have cash left over, you could run the automatic selection again (with Overwrite Old Selection set to No). This time, you might select other suppliers for payment, perhaps the government or your landlord. Each time you would enter a maximum amount, since you have limited funds available.

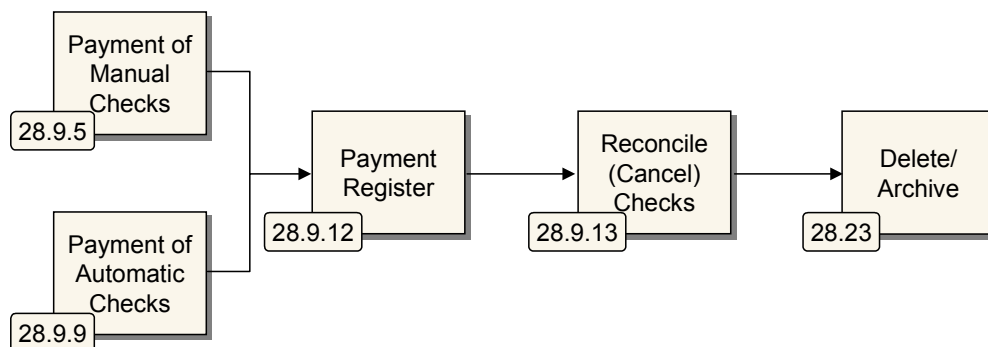
Manual Override

Once the selection is established, you can still override it manually. This enables you to remove or select additional vouchers for payment and change the amount of payment or discount taken on a previously selected voucher. Any voucher can be selected for full or partial payment.

Note Always print a payment selection register before printing checks. This details the exact selection you have made and prints a hashed total. This hashed total can be compared with the hashed total that prints on the audit report created when checks are printed.

Accounts Payable

Check Reconciliation



Intro-eB-Acctg-140

AP–Check Reconciliation

Cannot Delete/Archive Until Closed

The last step in the AP process is check cancellation (reconciliation), which indicates that the payment has been processed by the bank and flags it as closed.

Each payment you issue must be flagged as either canceled or void before it (or the vouchers it paid) can be purged to history using Closed AP Delete/Archive 28.23.

Payments can be flagged as processed using AP Check Cancellation Maintenance 28.9.13 or Cash Book Maintenance 31.13. They can be processed one at a time or in batch.

Optional Payment in Process

In MFG/PRO eB, you can delay decreasing the balance in your Cash account until after the payment has been processed by the bank. This is important in Europe.

When a payment is generated, it does not credit your Cash account, but the Payment In Process account instead. Later, when you run the check cancellation, the Cash account is credited and Payments In Process is debited. This is commonly done when using electronic funds transfer for cash transactions.

Accounting Systems Activities



Intro-eB-Acctg-135

Accounting Systems Activity

In the following activity you:

- Add a voucher for an invoice received from a supplier
- Process a payment to the supplier

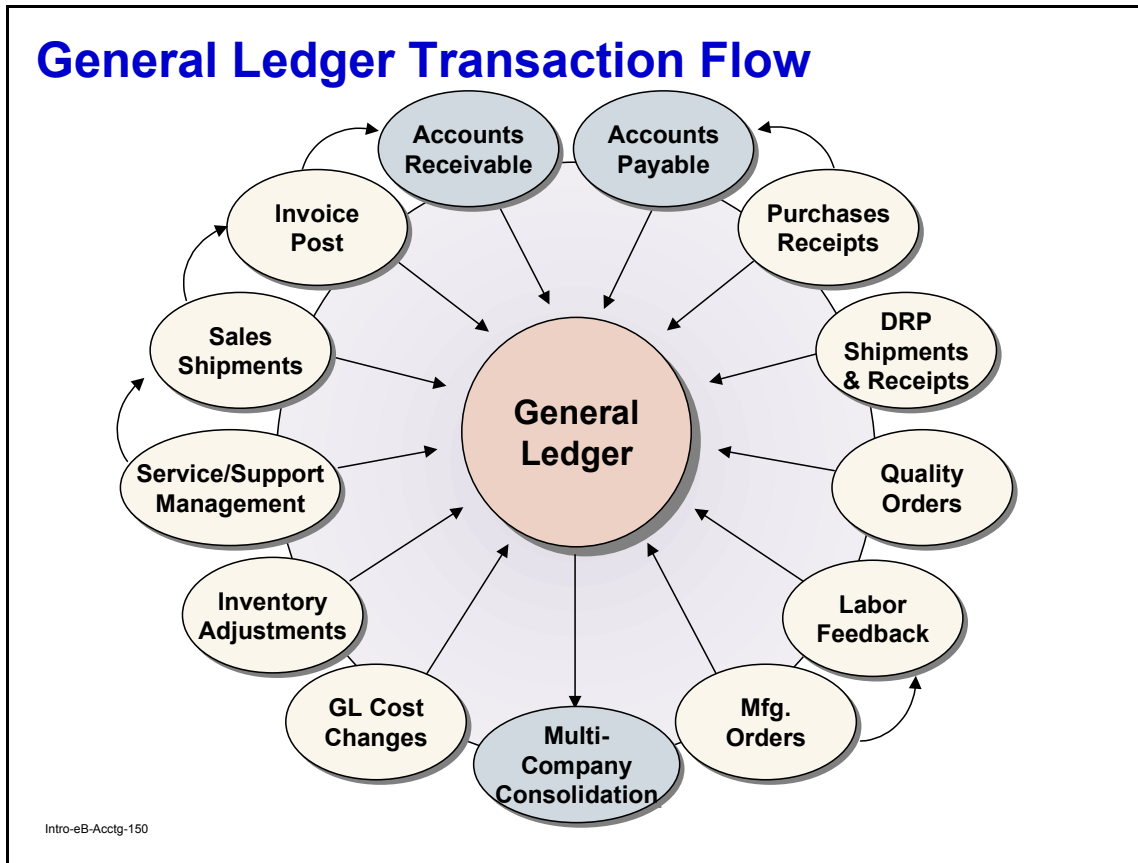
Add a Voucher for an Invoice Received from a Supplier

- 1 Modify the Accounts Payable Control File 28.24 by changing the default Ship-To field value to the manufacturing site address.
- 2 Use PO Receipt Cost Browse/Inquiry 5.13.3 to review the receiving history for POs you have received. Identify several purchase orders you will select to voucher.

- 3** Your supplier has sent an invoice for each PO. Use Voucher Maintenance 28.1 to add a voucher for each invoice received. If the supplier is the same, they may have billed you for multiple purchase orders on the same invoice—you can create a voucher for multiple purchase orders.
- 4** Voucher any or all of the items received. On each voucher line, enter the quantity and the cost of the item being invoiced. You may want to enter a different price than the purchase order price or a quantity different than what was received to see what GL variances are generated. Notice that variance amounts are automatically placed on hold.
- 5** Use Voucher Maintenance 28.1 to enter another voucher for the same supplier, but do not reference a purchase order. Notice that you must specify the GL expense accounts and amounts.
- 6** Use Supplier Activity Inquiry 28.13 to review the supplier's account balance.

Process a Payment to the Supplier

- 1** Use Payment Selection - Automatic 28.9.4 to select all the vouchers for payment.
- 2** Assume you have cash available to pay only half of one of the voucher amounts. Use Payment Selection - Manual 28.9.5 to modify the amount you intend to pay.
- 3** Use Payment - Automatic Checks 28.9.9 to print the checks to pay your supplier.
- 4** Review Supplier Activity Inquiry 28.13 and Voucher Inquiry 28.2 to see how the payment is pegged to the original voucher.
- 5** Use Payment - Manual Checks 28.9.10 to record a check written to pay for dinner for your classmates.
 - a** Record this handwritten check as a non-AP check (leave the voucher field blank).
 - b** You will need to set up a miscellaneous supplier for processing miscellaneous payments.
 - c** Use the remarks field on the manual check to record the check's payee.
- 6** As in AR, you can review the AP transactions you created using Unposted AP-GL Transactions Report 28.21.



General Ledger (GL)

The purpose of the GL module is the production of financial statements. The balance sheet and income statement permit the reporting of transaction and/or budget information for single or multiple companies. The transactions included on these reports originate from several sources.

Sources of Transactions

GL transactions can be:

- 1 Entered locally within the GL module,
- 2 Imported into the GL from other databases for consolidation, or
- 3 Created automatically by activities in other MFG/PRO eB modules.

Summary and Detail

In fact, any MFG/PRO eB function that affects inventory quantity, inventory cost, or the company's finances generates GL transactions. These transactions can be created in detail or in summary, depending on the setting in the module control file.

For example, AR and AP activities can be summarized by batch, whereas inventory activities can be summarized by day. This helps to minimize the number of transactions that you must deal with in the GL. Complete details are available in the source module (sub-ledger).

Unposted

These transactions come into the general ledger as unposted transactions, which do not affect GL balances and are not included on financial statements until they are verified and posted.

GL Transaction Delete

Often, other modules are implemented prior to implementing GL. Because most generate GL transactions, there may be a large number of unposted transactions sitting in the file when you implement the GL module. These can be deleted with the GL Transaction Delete/Archive 36.23.2.

General Ledger Setup

25.24 – General Ledger Control File

General Ledger Control File

User Menu Edit Queue Options Help

General Ledger (Company) Control File

Profit/Loss Account (BS): 2900

Retained Earnings Account: 2800

Translation Adj Acct (BS): 2950

Translation Adj Acct (IS):

Use Sub-Accounts: yes

Use Cost Centers: yes

Balanced Entities: yes

Allow Changes to Module Transactions: yes

Continuous Page Numbers for Post Audit: no

Last Page Number for Post Audit: 0

Daily/Continuous Reference Sequence: Daily

GL Transaction Audit Trail: no

Account Structure

XXXX	XXXXXXXXXX	XXXXXXXXXX	XXXX	XXXXXXXXXX
Entity	Account	Sub-Account	Cost Center	Project

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy

Intro-eB-Acctg-160

General Ledger Setup

Each of the following must be defined before using the GL:

- Primary entity
 - Entity codes

One entity in each database must be defined as the primary entity—the default for GL transactions.

In a multi-database implementation, the entities must be the same in each database.
- One GL calendar

Any number of periods can be established in a fiscal year and identified with start and end dates.

One GL calendar applies to all entities, but fiscal periods can be opened and closed individually within each entity.

- Format positions
 - These lay out your financial statements, that is, the balance sheet and income statement.
Each title/total line on your statements is assigned a format position number, then each GL account is assigned to a format position that determines where the account balance prints.
- Accounts
 - Account numbers consist of an account code and an optional sub-account and cost center
The latter provide an additional level of reporting and are often associated with divisions and departments, respectively.
- Project codes
 - All GL transactions can specify a project code.
 - Budgets can be entered by project and actual results compared to budget.
- Allocation codes
 - Transactions involving allocation of an amount among several entities, accounts, or projects can be entered more quickly if they reference a predefined allocation code.
 - The system automatically splits the transaction amount based on the percentages specified at the time the transaction is posted to the general ledger.

One Database – One Currency

25.24 – General Ledger Control File

General Ledger (Company) Control File

User Menu Edit Queue Options Help

Profit/Loss Account (BS): 2900
Retained Earnings Account: 2800

Translation Adj Acct (BS): 2950
Translation Adj Acct (IS):

Use Sub-Accounts: ☒ yes
Use Cost Centers: ☒ yes
Balanced Entities: ☒ yes
Allow Changes to Module Transactions: ☒ yes

Continuous Page Numbers for Post Audit: ☐ no
Last Page Number for Post Audit: 0
Daily/Continuous Reference Sequence: ☒ Daily
GL Transaction Audit Trail: ☐ no

F1=Help F2=Go ESC=End Ctrl-X=Cut Ctrl-C=Copy Ctrl-V=Paste

Diagram:

```

graph TD
    Entity1100[Entity 1100] --> BS1[Balance Sheet]
    Entity1100 --> IS1[Income Statement]
    Entity1200[Entity 1200] --> BS2[Balance Sheet]
    Entity1200 --> IS2[Income Statement]
    BS1 --> CS[Consolidated Balance Sheet]
    BS2 --> CS
    IS1 --> CS
    IS2 --> CS
  
```

Intro-eB-Acctg-170

One Database–One Currency

Profit/Loss and Retained Earnings

Whenever you print a balance sheet in MFG/PRO eB, the system calculates year-to-date profit or loss from the income statement accounts and registers it in the Profit/Loss account.

This account prints on the balance sheet. Then, when you close the books at the end of a fiscal year, the total profit/loss is posted to the Retained Earnings account.

These accounts are established in the GL Control File 25.24.

Other important operational information is also established here.

Use Sub-account and Cost Center

Indicate whether you use sub-accounts and/or cost centers. If either of these flags is set to No, the system does not prompt for data entry in that field.

Allow Modification

Complete auditability can be ensured by preventing modification of transactions passed from other modules. This ensures that the sub-ledgers always balance to your ledger.

- Pagination on audit trails can be maintained (required in some countries)
- Format of GL transaction numbers—Daily or Continuous. Use Continuous in countries where continuous GL reference is legally required.

Balanced Entities

The other important setting is the Balanced Entities flag.

This is meaningful only when multiple entities are used in the same database. It controls whether transactions must be balanced within entities in order to be posted.

If you need to produce financial statements for each individual entity within a database, you must set Balanced Entities to Yes.

If set to No, transactions do not have to balance within entities. The entire transaction must still balance so consolidated financial statements balance. However, you will be unable to produce financial statements for the individual entities.

General Ledger Transactions

Unposted

- Review Unposted Transaction Register (25.13.14) prior to posting
- Review transactions from outside modules
- Review transactions from outside databases
- Adjust transactions (25.13.1) prior to posting
- Enter standard (25.13.1), retroactive (25.13.2) and reversing (25.13.3) transactions
- Enter year-end adjustment (25.13.5)
- Post transactions (25.13.7)

Posted

- Drill down to transaction detail (25.13.20)
- Updated account balance reflected in statements (25.13.7)
- Posted transactions can be copied (25.13.4)
- Foreign Currency Revaluation occurs to posted transactions (25.13.9)
- Transaction Register (25.13.21) to review all posted transactions

Intro-eB-Acctg-180

General Ledger Transactions

General ledger transactions can be entered directly into the GL module as standard transactions, retroactive transactions, or reversing transactions. A copy function permits new transactions to be copied from posted transactions. This is handy for recurring entries.

Control Total

As in the other financial modules, control totals can be used when you enter GL transactions. The control total is the sum of the debit entries. A transaction total is maintained by the system; this total is zero when the transaction is balanced.

Memo and Statistical

Each transaction line item contains the entity, account, sub-account, cost center, project (or allocation code), transaction description, and amount.

Transactions can also be entered for memo or statistical accounts. These accounts print but are not included in the totals on financial statements. They can be included in custom reports.

All Unposted

Transactions can also originate from other MFG/PRO eB modules or be imported from other databases. Foreign exchange revaluations also generate GL transactions. All transactions are stored as unposted transactions. They can be added, modified, or deleted prior to posting. Once posted, they cannot be changed.

Unposted Transactions

25.13.13 – Unposted Transaction Inquiry

Unposted Transaction Inquiry

UserMenu Edit Queue Options Help

GL ReferenceBatchCurUnb OnlyOutput

IC961009000001USDno

GL Reference	Batch	Eff Date	Entered	User ID	Total
IC961009000002		01/01/01	01/01/01	NCG	0.00

Line	Account	Project	Enty	Description	Amount	Cur
1	1500-0100		1000	ECT-PO PO1029	100.00	USD
2	2200-0100		1000	ECT-PO PO1029	-100.00	USD

List complete.

F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-Acctg-190

GL–Unposted Transactions

Transaction Type

Unposted Transaction Inquiry 25.13.13 reviews unposted transactions. The source of a transaction is easily identified by looking at the GL reference code and transaction type. Reference codes are unique and consist of the transaction type followed by the entered date and a number.

Transaction types are:

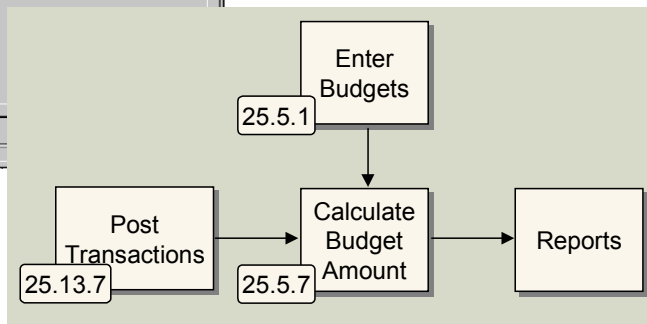
- AP: Accounts Payable (vouchers, payments, check void)
- AR: Accounts Receivable (memos, finance charges, payments)
- CS: GL Transaction Consolidation 25.13.11
- FA: Fixed Assets
- FX: GL Foreign Exchange Revaluation 25.13.9
- IC: Inventory Control (issues/shipments, receipts, returns, count updates)
- JL: GL Standard Transaction Maint. 25.13.1 or Transaction Copy 25.13.4
- RA: GL Retroactive Transaction Maintenance 25.13.2
- RV: GL Reversing Transaction Maint. 25.13.3 or Transaction Copy 25.13.4
- SO: Sales Order Invoice Post 7.13.4
- WO: Labor transactions in Shop Floor Control and Repetitive, and by
Work Order and Cumulative Orders Accounting Close 16.21/18.9
- XX: Transaction Import (in consolidation database)
- XY: GL Imported Transaction Revaluation 25.19.17
- YA: GL Year-End Adjustment Transaction
- YR: Transaction Year-End Close 25.13.12

Post transactions using Transaction Post 25.13.7 before they appear on financial reports. The process updates GL account balances. Post transactions at least once each calendar period. You can post by transaction type to allow a department to close its books earlier than another.

Budgets

25.5.1 – Budget Maintenance

Pd	Percentage	Budget Amount	Entered
1	25.000	0.00	07/03/00
2	25.000	0.00	10/02/00



Intro-eB-Acctg-200

General Ledger–Budgets

Multiple Budgets

An unlimited number of budgets can be maintained, each identified by a budget code, so you can maintain multiple versions of the same budget (that is, successive budget revisions in a year), as well as several different budgets for one year.

By Account or Format

Budgets can be entered for a specific account, sub-account, cost center, and project combination, engineering research and development costs for a particular project, for example.

Budgets can also be entered for a group of accounts or a format position. For example, you may budget Sales, where sales consists of not one account but several, all grouped under a particular format position.

Budget amounts can be entered manually for each fiscal period or a total budget can be spread by percentage or automatically across all fiscal periods.

Percent of Actual

Another option is to set up budgets not as fixed amounts but as percentages of actual activity. For example, the budget for Cost of Sales can be set as 50% of Sales, or the budget for Medical Expenses may be 15% of Payroll.

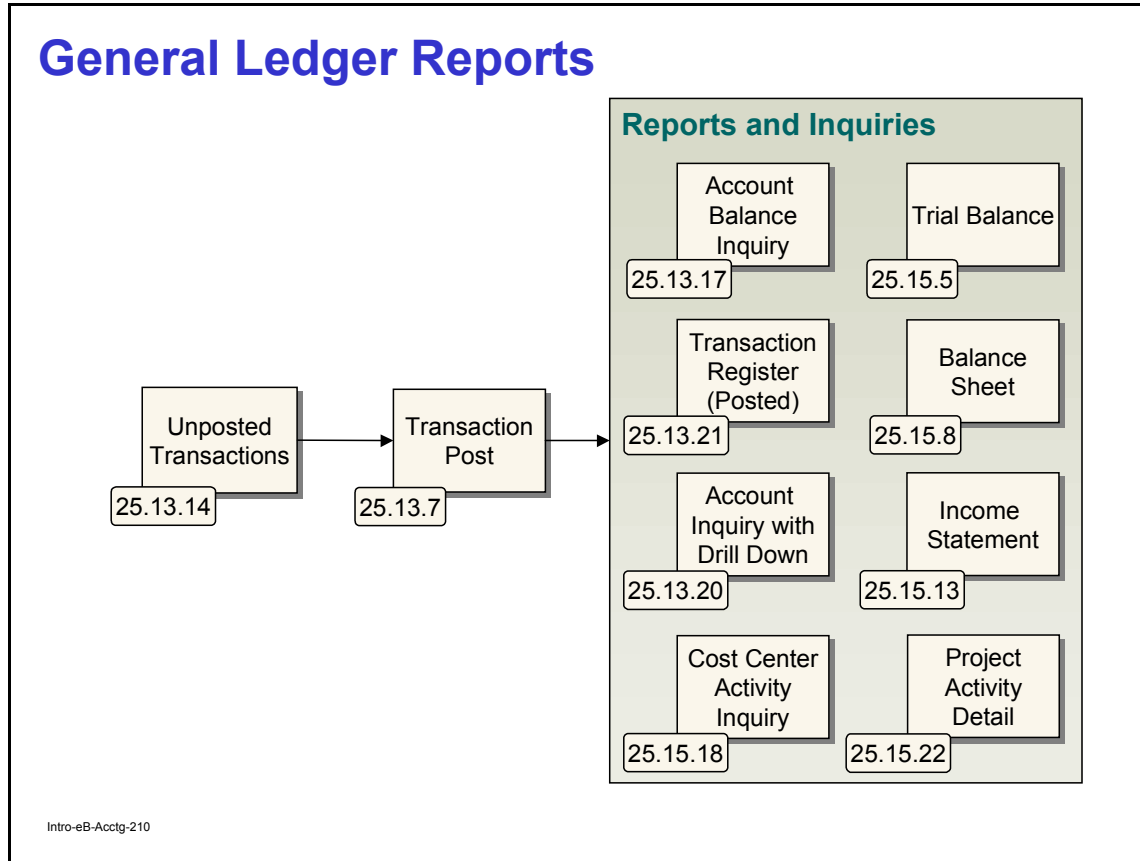
In the first example, the budget for one format position is based on the actual activity of another format position. In the second, the budget for a specific account is based on the actual activity of another account.

Budget Calculate

When using budgets as a percentage of actual activity, it is necessary to run the Budget Calculation 25.5.7 before you can print budgeted financial reports. This process determines the budget amounts based on the actual values in the specified accounts or format positions.

Comparative Reports

All GL reports have an option to print budget or actual amounts. Comparative reports can print both.



General Ledger—Reports

Report Options

A variety of reports are available within the GL module for you to review current balances, detailed activity, and multicolumn comparative reports.

Reports are designed to be as flexible as possible; you can access as much or as little detail as you need. Each report gives you the option to print information for one or more cost centers or sub-accounts, in summary or at any level of detail.

Effective Dates

On all but the balance sheet, you specify a range of effective dates. Only transactions with effective dates in that range are included on the report.

Note that, unlike other systems, these dates do not have to correspond to fiscal periods—you could print an income statement for the period of March 3 through July 14 if you want. The only restriction is that an income statement cannot span fiscal years.

Entity Range

Reports can be for a single entity or for a range. Consolidated reports are generated by specifying a range of entity codes.

Custom or Results

In addition to the standard MFG/PRO eB reports, you can easily create your own reports using the Custom Report functions. These enable you to define reports that print only a subset of accounts or print them organized in a different way from standard reports.

Most of the same options are available when printing custom reports as are available with standard reports. Additional reporting is also available using Results, an end-user report writer available from PROGRESS.

GL Report Writer

The General Ledger Report Writer is a separate module that enables you to produce full financial statements and reports. Reporting is based on user-defined hierarchies on any segment of the GL.

Accounting Systems Activities



Intro-eB-Acctg-215

Accounting Systems Activities

In the following activity you:

- Review GL set-up parameters and review how to structure financial statements
- Process GL transactions
- Print company financial statements

Review GL Setup and Review How to Structure Financial Statements

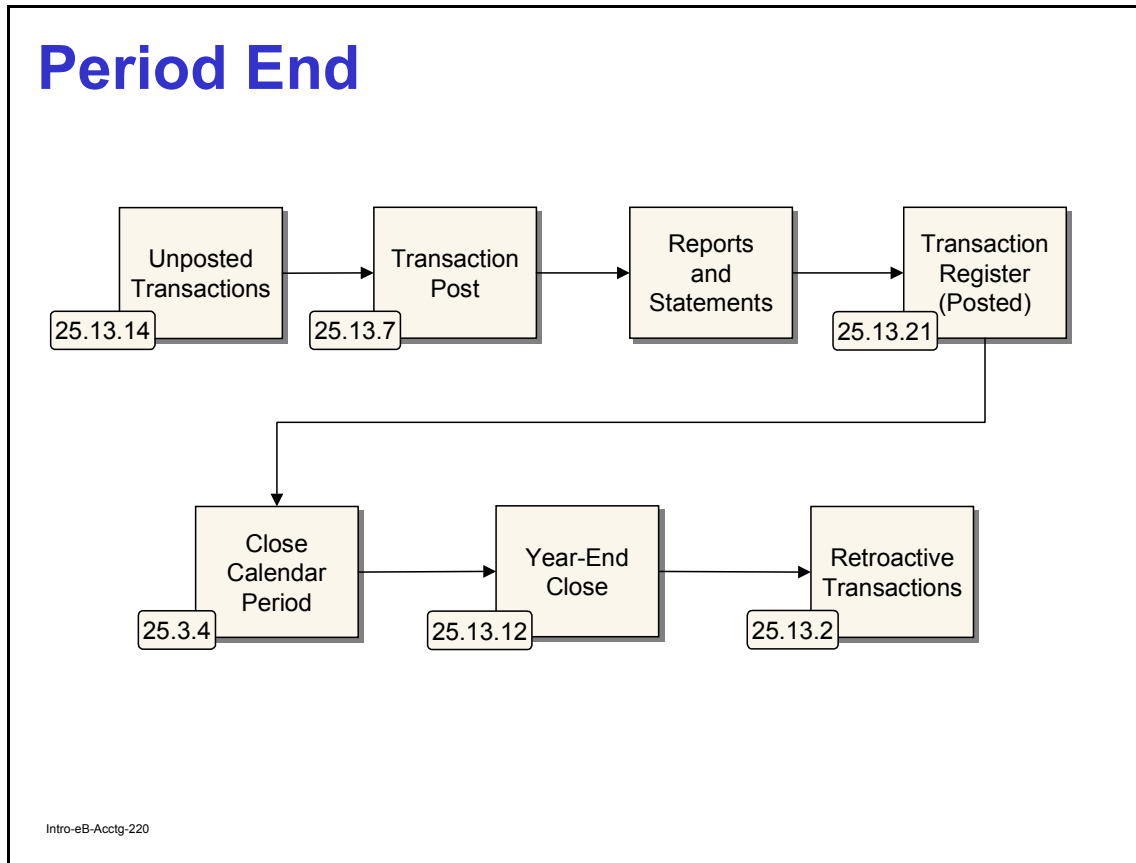
- 1** We have already set up entity codes and GL fiscal calendars for your company. Review this data if you have any questions on setup.
Your entity should be set up as the primary entity. You should have at least one period open for the current year and valid for the current date.
- 2** Review the General Ledger Control File 25.24.
 - a** Make sure the use Cost Center Flag is set to Yes.
 - b** Also make sure the Daily/Continuous Reference Sequence flag is set to Daily.
 - c** What are the advantages of using the daily sequence?

Process GL Transactions

- 1** Use Unposted Transaction Inquiry 25.13.13 to review transactions that have already been created in your database.
 - a** What information can you derive from the transaction number (transaction type, date transaction was created, and sequence number)?
 - b** What detail is provided for each transaction?
- 2** Run Unposted Transaction Register 25.13.14 for your primary entity for all transaction types.
- 3** Review the account balance in Account Balance Inquiry 25.13.17 for Sales Account 3000.
 - a** What is the current balance of this account?
 - b** Why?
- 4** Run Transaction Post 25.13.7 for all transaction types.
- 5** Review the account balance in Account Balance Inquiry 25.13.17 for Sales Account 3000.
 - a** What is the balance of this account now?
 - b** Why?
- 6** Use Inquiry by Account with Drill Down 25.13.20 on account 3000. What information does this provide?

Print Company Financial Statements

- 1** Use Unposted Transaction Register 25.13.14 to review outstanding transactions.
Modify any transactions that are unbalanced or posted to the wrong accounts in Standard Transaction Maintenance 25.13.1.
- 2** Post all transactions for the company entity using Transaction Post 25.13.7.
- 3** Print a balance sheet 25.15.8 and an income statement 25.15.13 for your company entity.
Was your company a success?



GL–Period End

Manufacturing and Sales are continuous; financials are reported periodically.

Module and GL Closed

At period end, the fiscal period is closed to additional activity. Usually, a period is closed first to module activity—sales, purchasing, AR, AP—and later to GL activity, once all closing entries are complete and statements published. This can be done at different times for each entity.

Reopen Period

To close a fiscal period, set the Module or GL Closed flags in GL Calendar Maintenance 25.3.4 to Yes. If you need to reopen a period, simply reset the Closed flag to No. Any period can be reopened until year-end processing is complete.

GL–Year End

Year-End Close

To close a year, run Transaction Year-End Close 25.13.12. This posts net profit/loss to retained earnings. Once closed, a fiscal year cannot be reopened, however, retroactive transactions can be entered. These transactions update retained earnings if needed.

Transaction Detail Retained

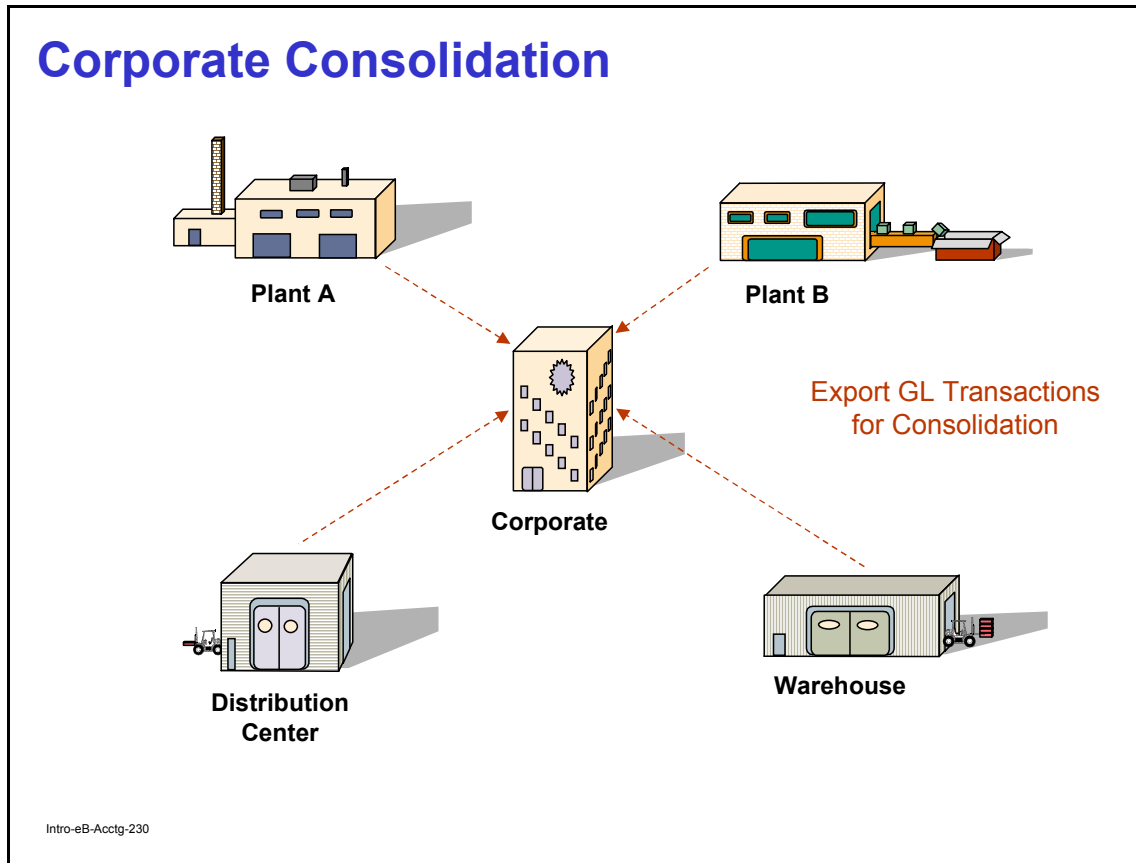
Transaction details are not lost when a period/year is closed. Complete transaction detail is maintained in the general ledger, allowing comparative reports to be printed at any time. Detailed transactions can be kept on the system for as long as needed without affecting the speed of report processing.

You may want to consolidate past transactions after closing the fiscal year to save disk space.

Consolidation

Posted transactions of each period are combined by entity, account, sub-account, cost center, and project. Each transaction is assigned a GL reference number beginning with CS (transaction consolidation).

The effective date of the transaction is the ending effective date specified by the consolidation request. This is done instead of a delete/archive of GL transactions.



GL—Corporate Consolidation

A different use of the word consolidation refers to the process of accumulating financial information from several entities to generate consolidated financial reports.

For this type of unification, we are typically bringing in information from entities that operate in other databases, perhaps on computers in other countries.

Multi-entity Consolidation

When you have multi-entity operations, usually you maintain a database where all operations are consolidated; in our example, we have called this Corporate. Each of the individual operations

generates its own financial statements using its own chart of accounts and base currency. Then, each operation sends its financial results to Corporate for consolidation.

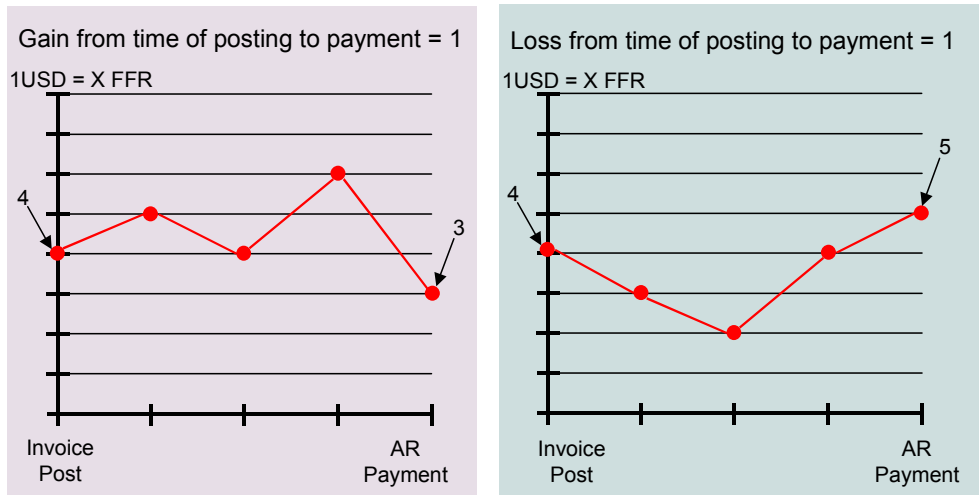
Multiple levels of consolidation can be done in this way; consolidated reporting can occur, for example, at the country or regional level and then at a multinational level.

Export/Import Process

The consolidation process is as follows:

- Once a period has been closed at the local level, transactions are exported to an ASCII file
 - Transactions can be exported in summary or consolidated
- The ASCII file is sent to Corporate, and there the transactions are imported
 - Account cross-referencing and currency translation take place during this import process
- Imported transactions are posted, and consolidated financial statements are printed

Realized Gain/Loss (Sales)



Intro-eB-Acctg-240

Realized Gain/Loss

Unrealized vs Realized

As currencies change in value, the value of your sales and purchases effectively changes also. This is called an unrealized gain/loss—unrealized because no money has actually changed hands.

Currency exchange rates can fluctuate many times between the time an order is placed and the time it is actually paid for. Therefore, it is not until the monetary transaction takes place that any gain/loss is realized.

Sales Orders/Accounts Receivable

SO Rate 4 FFR/\$

When a sales order is entered in another currency, an exchange rate is recorded. This rate is used for sales reporting. If this exchange rate is not designated as fixed when the order is invoiced, the current effective rate is picked up (in our example, 1 USD = 4 FFR).

This rate is passed to Accounts Receivable and recorded on the Dr/Cr memo.

Pay at 3 FFR/\$ = GAIN

Exchange rates can fluctuate between the time the invoice is prepared and the time the customer pays you. When this happens, you have realized an exchange gain or loss. The gain or loss is calculated automatically by the system and posted to the realized gain/loss account.

In our example, the rate has changed to 1 USD = 3 FFR. If the invoice was for 1,000 FFR, those FFR are now worth 333.33 USD.

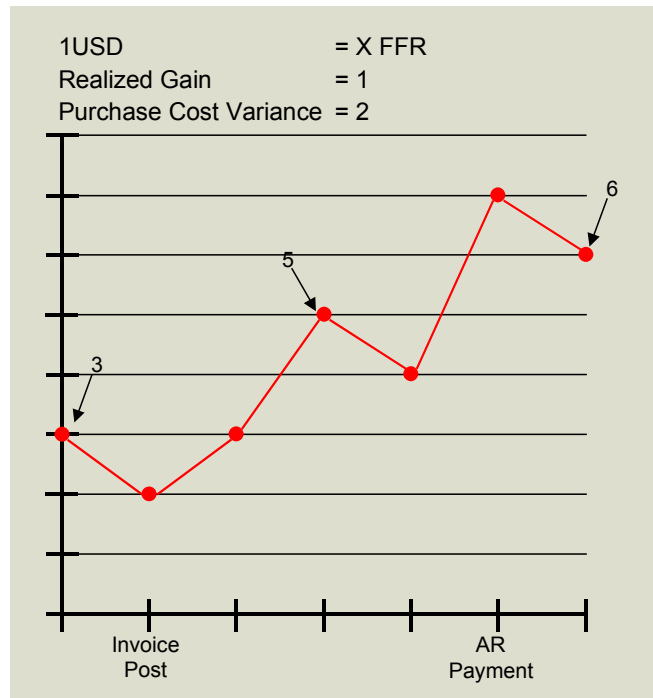
But when you invoiced the customer 1,000 FFR at 1 USD = 4 FFR, you expected to receive only 250 USD. As a result, you have realized a gain, purely because of exchange fluctuations.

Pay at 5 FFR/\$ = LOSS

Had the reverse happened, you would have experienced a loss.

If the rate rose to 1 USD = 5 FFR, the 1,000 FFR, you would receive only 200 USD instead of 250 USD, for a loss of 50 USD.

Realized Gain/Loss – Purchase Orders



Purchasing/Accounts Payable

Rate Stored on Receiver

The process in purchasing is similar to accounts payable. The only difference is that some of the exchange rate fluctuation is captured in purchase cost variance and the rest is a realized gain/loss.

As in sales orders, an exchange rate is entered on a purchase order. This rate is used for purchase order reports. If this rate is not designated as fixed, it is changed to the current exchange rate when items are received. This rate is stored on the receiver.

Purchase Cost Variance

When the supplier invoice is entered into AP, the exchange rate is entered on the voucher. This may be different from the rate on the receiver. When this is the case, the supplier invoice cost (in base) will not match the receiver cost. This is a variance, but not an AP rate variance.

Instead, the purchase cost variance, due to currency fluctuation, is posted to a separate account specified in Exchange Rate Maintenance 26.4.

In our example, the fluctuation from 3 FFR to 5 FFR is posted as a purchase cost variance. Any variance after this amount is an AP rate variance.

Pay at 5 FFR/\$ = GAIN

Later, when we actually pay the invoice, if the exchange rate on the payment does not match the exchange rate on the voucher, a gain/loss is realized.

As shown in the illustration on page 418, this is the gain realized from the exchange rate changing from 5 FFR to 6 FFR. If you owed 1000 FFR, it would have cost you 200 USD at the old rate, but at the time of payment it costs you only 166.66 USD—a gain of 33.34 USD.

Had the exchange rate fallen to 4, you would have realized a loss.

Calculation of Unrealized Gain/Loss

Account: 1045

Cash - Bank of Amsterdam

Currency: DFL

<u>Date of TRXN</u>	<u>Amt in DFL</u>	<u>Exchange Rate</u>	<u>Amount in USD</u>
1/15/91	2,500	1.6970	1,473.19
3/20/91	<u>4,000</u>	1.7195	<u>2,326.26</u>
	6,500		3,799.45

Exchange Rate on 4/30/91 = 1.9130

Total in DFL = 6,500

Equivalent in USD = 6,500 / 1.9130 = 3,397.80

Difference 3,397.80 - 3,799.45 = < 401.65 > USD

FX Transaction

<u>Eff Date</u>	<u>Acct</u>	<u>Amount</u>
4/30/91	1045	<401.65>
	9150	401.65

Intro-eB-Acctg-260

Calculation of Unrealized Gain/Loss

How do we account for changes in exchange rates that happen before money changes hands—an unrealized gain/loss?

Historical Rates in GL

In the general ledger it is possible to maintain asset and liability accounts in another currency. Amounts posted to those accounts hold the currency amount, transaction exchange rate, and the base amount.

When we print financial statements, that base amount prints. But that base amount does not reflect today's exchange rates.

For example, if you have a bank account at the Bank of Amsterdam, the amount that you deposited at historical rates does not reflect the amount that you could really get if you liquidated that account and exchanged the money for your base currency today.

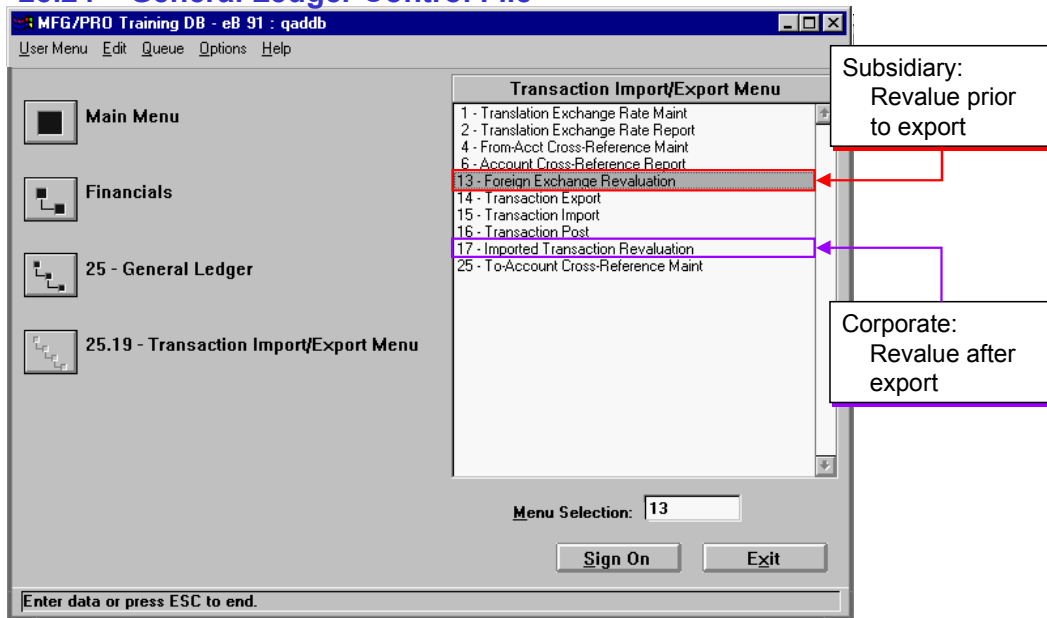
Revalue GL

Usually at period end, prior to printing financial statements, you revalue any amounts held in foreign currency accounts—cash accounts, AR, AP, bank loans, and any other asset or liability.

As shown in the illustration on page 420, this process determines the value of that account based on today's exchange rate and creates an FX (foreign exchange revaluation) type journal transaction to account for the difference. This is done by running the Foreign Exchange Revaluation 25.19.13.

GL Revaluation

25.24 – General Ledger Control File



Intro-eB-Acctg-270

GL-Revaluation

Revalue Before Export

When multiple entities using different currencies are involved, revaluation becomes more complex. Each entity needs to produce its own books, so the Foreign Exchange Revaluation 25.19.13 is run as part of period-end processing.

Then, transactions are exported to be consolidated at corporate.

Translation Process

Each entity may be operating in a different functional currency—one in DM and one in FFR, for example. These can be consolidated into one of those currencies, or a third—perhaps NLG.

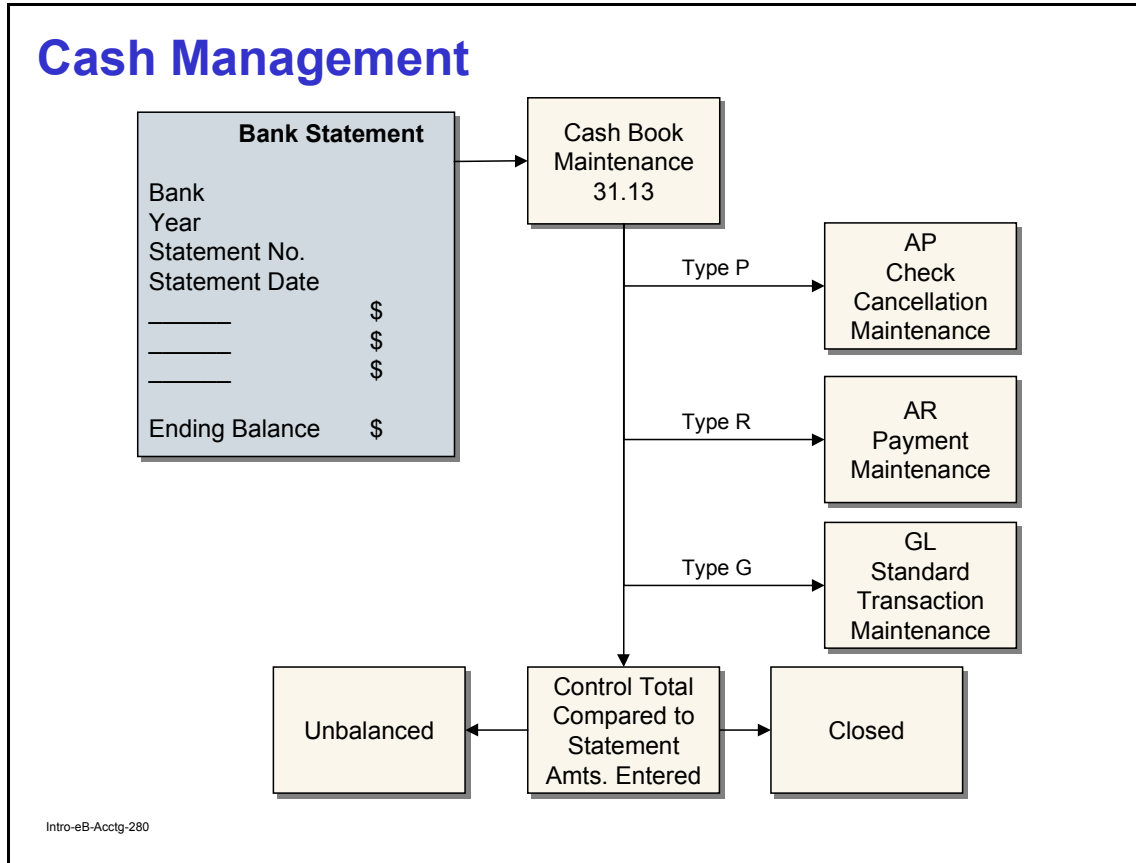
Foreign currency amounts are translated to the corporate currency during the import process. During this process, the system does the following:

- 1** It looks at the account currency on both databases. If different, the account is translated.
- 2** If the account currency is different, it translates the account using the current, weighted average, simple average, historical, or user-defined rate (depending on the translation index for that account).
- 3** A balancing entry (translation adjustment) is calculated and posted. This entry can be posted either to the income statement or to the balance sheet.

Current Rate Accounts

Some GL accounts can be translated at the current rate. For each period, it is likely that this current rate will be different. Transactions imported in March come in at March's rate, and those imported in April come in at April's rate.

These imported transactions need to be revalued each period to the new current rate. This is done using the Imported Transaction Revaluation 25.19.17.



Cash Management

In the last two sections, we noted that cash activities can be processed using the Cash Book, a function available in the Cash Management module that lets you process all cash activities in one place.

Cash Book is commonly used by companies that process most of their transactions using bank transfers or receive most of their cash via wire transfer or in a lock box. The bank sends a statement of all activity during a certain period (often daily), and all cash transactions are entered based on that statement.

Cash Book Maintenance 31.13 is used to:

- Reconcile AP checks
 - These are still produced in AP, but recorded here when they clear the bank
- Record customer payments
 - Cash receipts from customers would not be recorded in the AR module
When they appear on the bank statement, they are processed in Cash Book Maintenance.
This is used to process all cash receipts—non-AR, applied, or unapplied.
- Enter miscellaneous cash transactions
 - Cash transactions unrelated to AP or AR can be recorded here as well:
 - Bank charges
 - Wire transfer fees
 - Miscellaneous deposits and withdrawals
 - Enter them right off the statement as a standard GL journal transaction entry instead of manually in the GL module

Balance to Statement

Cash Book Maintenance ties a group of cash transactions together under one statement number for verifying the accuracy of your bank statements. If your book balance and the bank balance do not agree, the statement is flagged as Unbalanced.

Cash Flow Projections

31.8 – Cash Flow Projection Report

Cash Flow Projection Report

UserMenu Edit Queue Options Help

Entity: 1000 To: 1000
Bank: AA To: AA

Include Misc Cash: ☒ Print Detail: ☒
 Include AR: ☒ Print Detail: ☒
 Include SO: ☐ Print Detail: ☒ Confirmed SO's Only: ☒
 Include FS: ☐ Print Detail: ☒
 Include AP: ☒ Print Detail: ☒ Confirmed Vouchers Only: ☒
 Include PO: ☐ Print Detail: ☒

Add Avg Days Late: ☒
 Age by Expected Date: ☒
 Age by Credit Terms: ☒
 Currency: USD
 Round to Nearest Thousand: ☐

Start Date: 01/16/01
 D/W/M/P: W
 Per Column: 1
 Reporting Currency:
 Output: window
 Batch ID:
 F1=Help F2=Go ESC=End *Next/Prev* Ctrl-X/C/V=Cut-Copy-Paste

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Cash Flow Projections

Cash Flow from Operations

One other useful feature of the Cash Management module is cash-flow reporting. This is used to project future cash positions based on the system's expected:

- Cash sources
 - Sales
 - AR
 - Service and support
 - Miscellaneous cash

- Cash uses
 - Purchasing
 - AP
 - Miscellaneous cash

The Cash Flow Projection Report 31.8 is used to project cash flow from operations and shows relative cash positions (plus or minus) for user-specified periods, including only those sources or uses of cash you specify.

Expected Pay Date

Most of the sources and uses of cash are derived from activities in other MFG/PRO eB modules.

Miscellaneous cash-flow items are used to record money you expect to receive that is not related to:

- Normal sales, service or AR activities, sSuch as tax refunds or corporate borrowings
- Money you expect to pay that is not related to normal purchasing, service or AP activity, such as payroll expenses, taxes, or dividends

Each source or use of cash can be assigned an expected pay date.

Short- vs Long-Term Projections

Short-term cash-flow projections normally include only open items—AR and AP—and miscellaneous cash items. These are often done by entity and bank.

Long-term cash-flow projections include sales and purchases. They give you a general idea of what cash position you can expect, but they cannot be 100% correct, because due dates may slip or payment may not be made according to the terms specified.

Hedging

Long-term projections can be very useful for currency-hedging purposes. A cash-flow projection can be done by currency. This is useful for determining your exposure in different currencies and the approximate maturity.



Course Overview

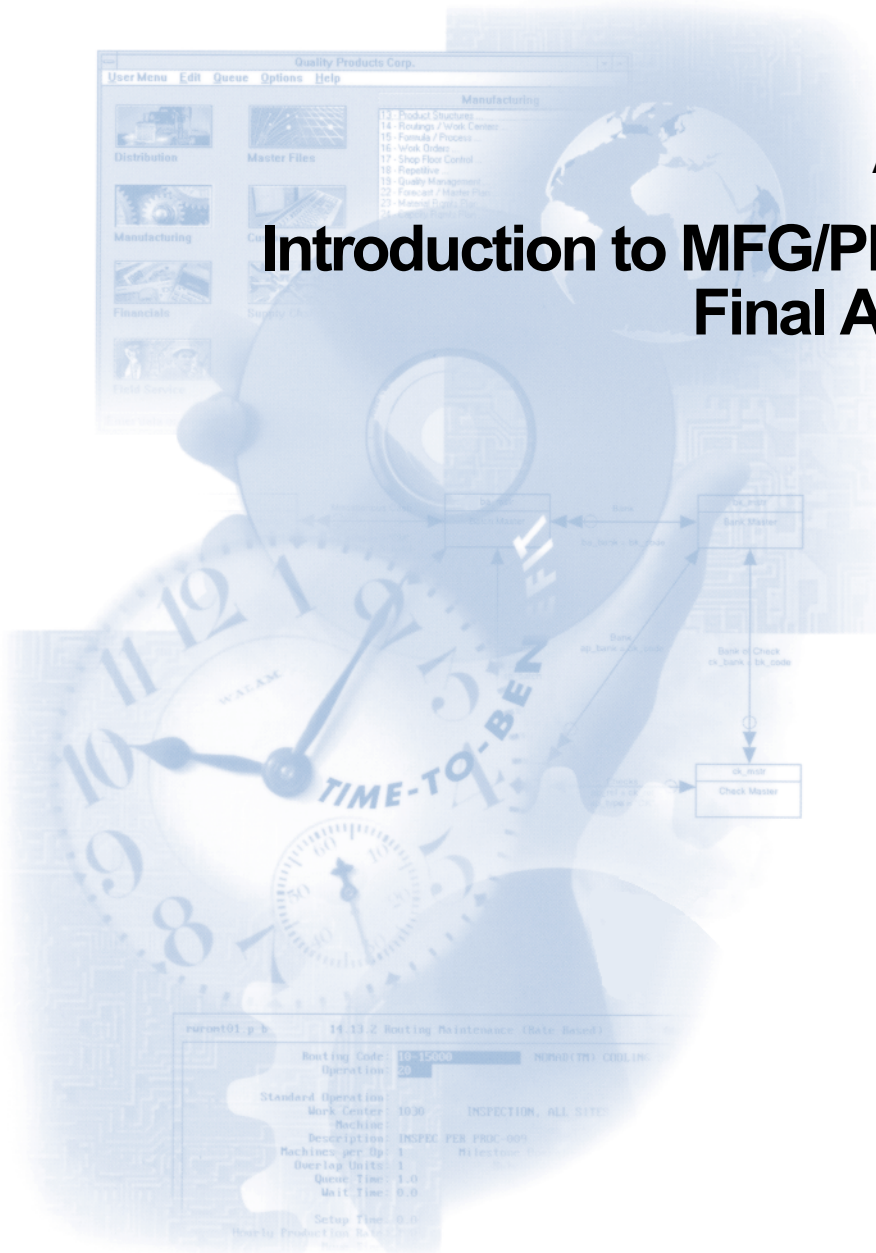
- ✓ Introduction to MFG/PRO eB
- ✓ MFG/PRO eB Navigation
- ✓ Supply Chain Concepts
- ✓ Set Up MFG/PRO eB
- ✓ Use MFG/PRO eB
- ✓ Set Up and Use MFG/PRO eB
 - ✓ Planning Systems
 - ✓ Advanced Processing
 - ✓ Accounting Systems

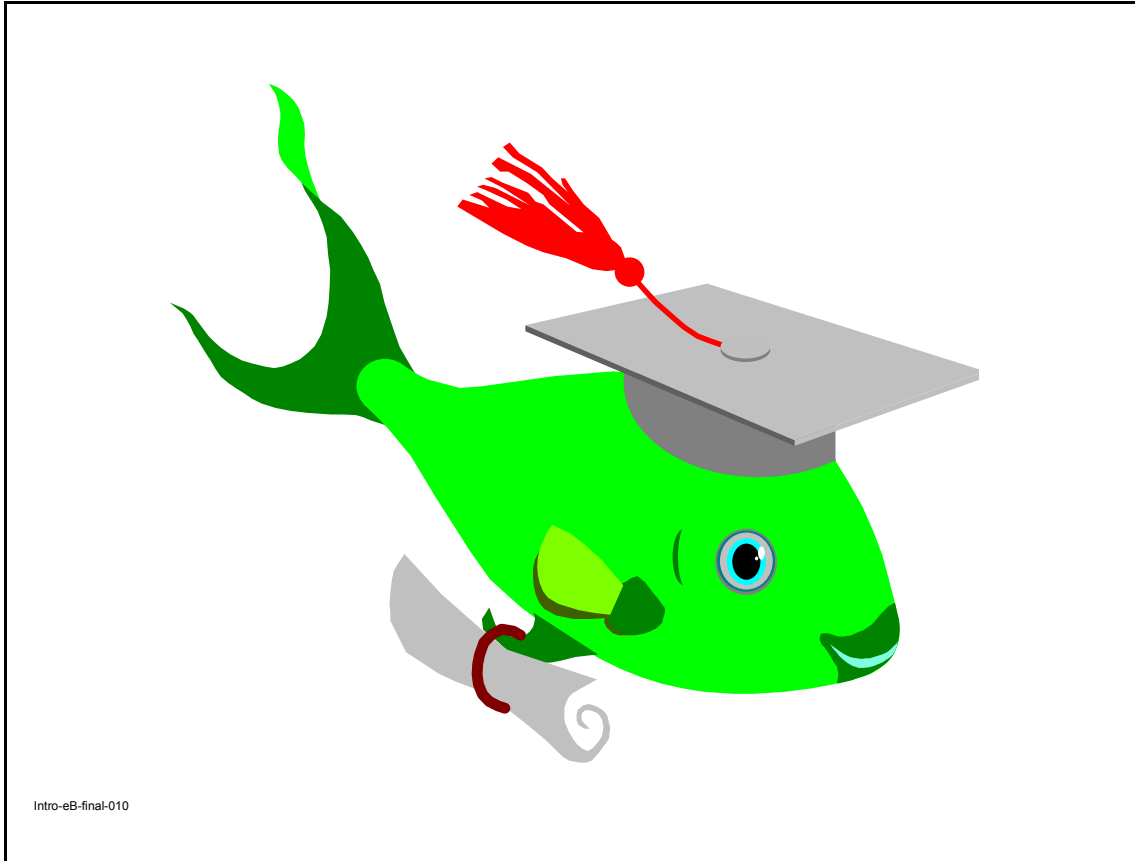
Intro-eB-Acctg-300

Course Overview

APPENDIX A

Introduction to MFG/PRO eB Final Activity





Instructions: This optional activity is open book and open terminal. Please use your system documentation and on-line help facilities. Remember that your time is limited; do not waste it adding data that is not required.

This activity is set up in the form of a business simulation. During this activity, you will set up a database to run a business. You will be asked to print a number of reports to verify that this has been completed in a satisfactory manner. There is more than one way to do this, and responses will be checked for reasonableness, not absolute correctness. Please read the entire set of instructions before starting.

MFG/PRO eB experts are available for consulting at the rate of 100 “clams” per question. Don’t let the consultants end up with all the clams!

Unplanned inventory transactions are not allowed. Your database will be audited for unplanned transactions at the end of the activity and penalties levied. You may have your work checked by a consultant at any time without penalty.

The test is self-scoring. You will start with an investment of working capital in QAD University clams which may be used to buy consulting services from the QAD staff on hand to monitor the test. You will be paid in clams for proper completion of certain steps or activities. Your goal is to complete the activity with more clams than you started with.

Set Up an Entity Code

- 1** Set up an entity code for your business in 25.3.1 Entity Code Maintenance. Do not use an existing entity code.
- 2** Set the default bank code to recognize your entity code in 26.13 Bank Maintenance, second frame.

System Account Control File Set Up

- 1** Set the flags for Verify GL Accounts and Verify Projects to No.
- 2** Set Sub-Module Sub-Account Length to 0.
- 3** Set your new entity code.
- 4** Define a base currency code. (We suggest leaving it at USD.)
- 5** Set all tax flags to No.
- 6** Set the audit trail flag to No.

General Ledger

Instructions: To start your business, QAD University is going to loan you 1000 clams. At the end of the class we will see if you have made any profit from your business. To process your loan, use general ledger transactions.

- 1 Go to the General Ledger module (25).
- 2 Select the General Ledger transactions menu (13).
- 3 Select standard transactions (1).
- 4 Enter a 1,000 debit to cash, account 1040, and a 1,000 credit to long term debt, account 2600. The credit goes into the system with a negative sign in front of the amount, like this; -1000.

Sales Order Control File Set Up

- 1 Set the Integrate with SA flag to Yes.
- 2 Set the AR flag to Yes.

Set Up a Unique Entity and Site Code

- 1 Select a company name and cause it to appear on your terminal screen and reports.
- 2 Put your name in the system as an employee.

Keep the test simple, do not add data (descriptions and address detail, for example) that is not required.

Reports without your company name will get you a reduction in payment.

You may want to modify default control file settings to speed your set up and operation. However, be careful not to modify control file settings that will make the test harder by checking or verifying values not actually required by the test.
- 3 After the data load phase you will be asked to produce several reports which will be checked for reasonableness.

If your data is not adequate to allow you to continue with the simulation, you will be charged consulting fees to correct the data.

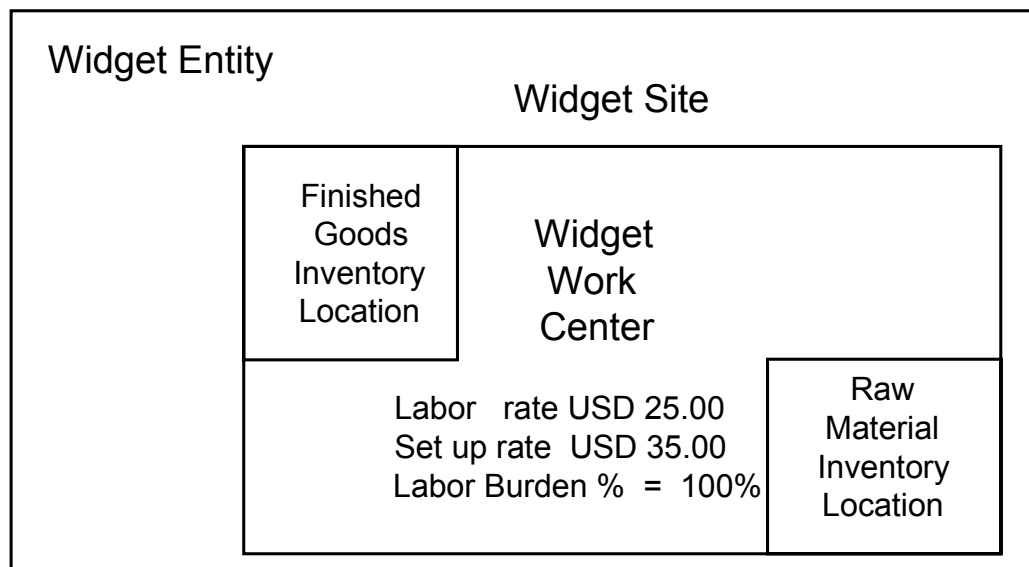
Fees are 100 clams per major error. You will be given the opportunity to find and fix the error yourself if desired.

During the activity monitors may audit your system.

Widget Making

Instructions: You have one site; it has an inventory location for raw materials and one for finished goods. Both locations are available and nettable, but do not allow a negative balance.

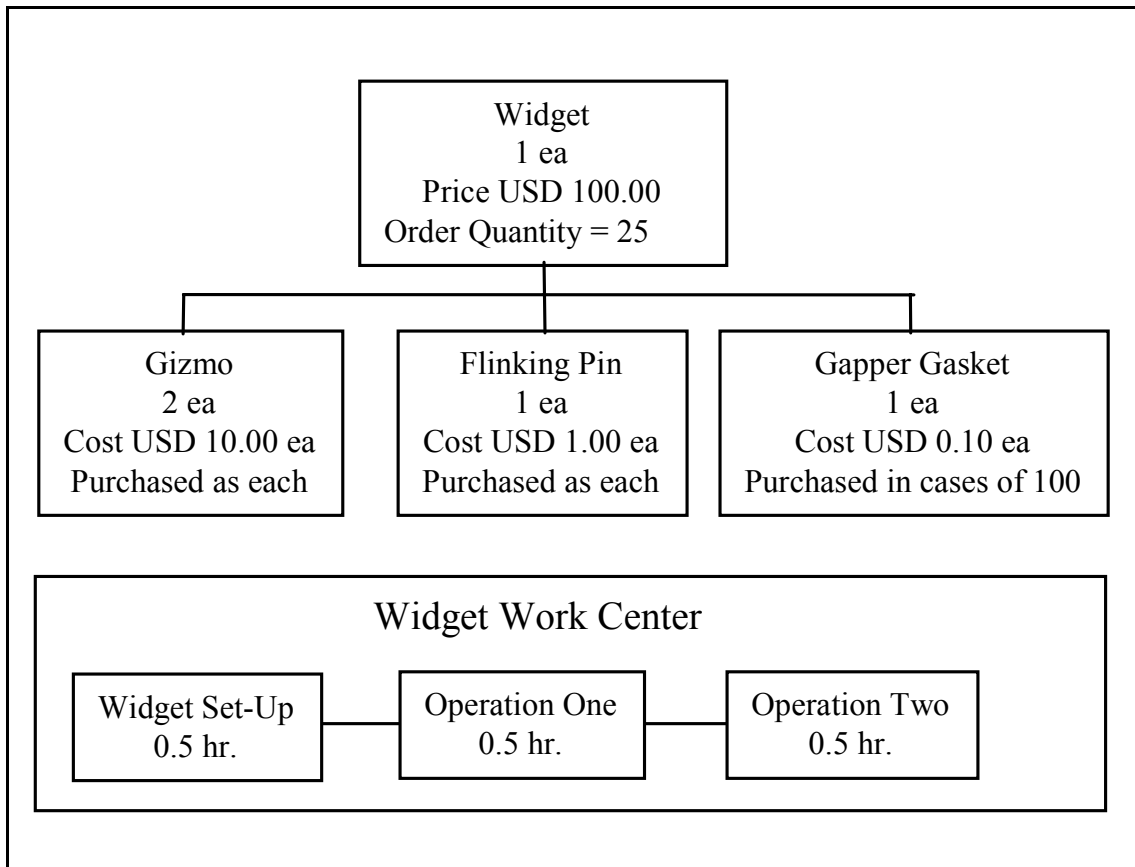
- 1 Set up your site, your locations, and one inventory status code.



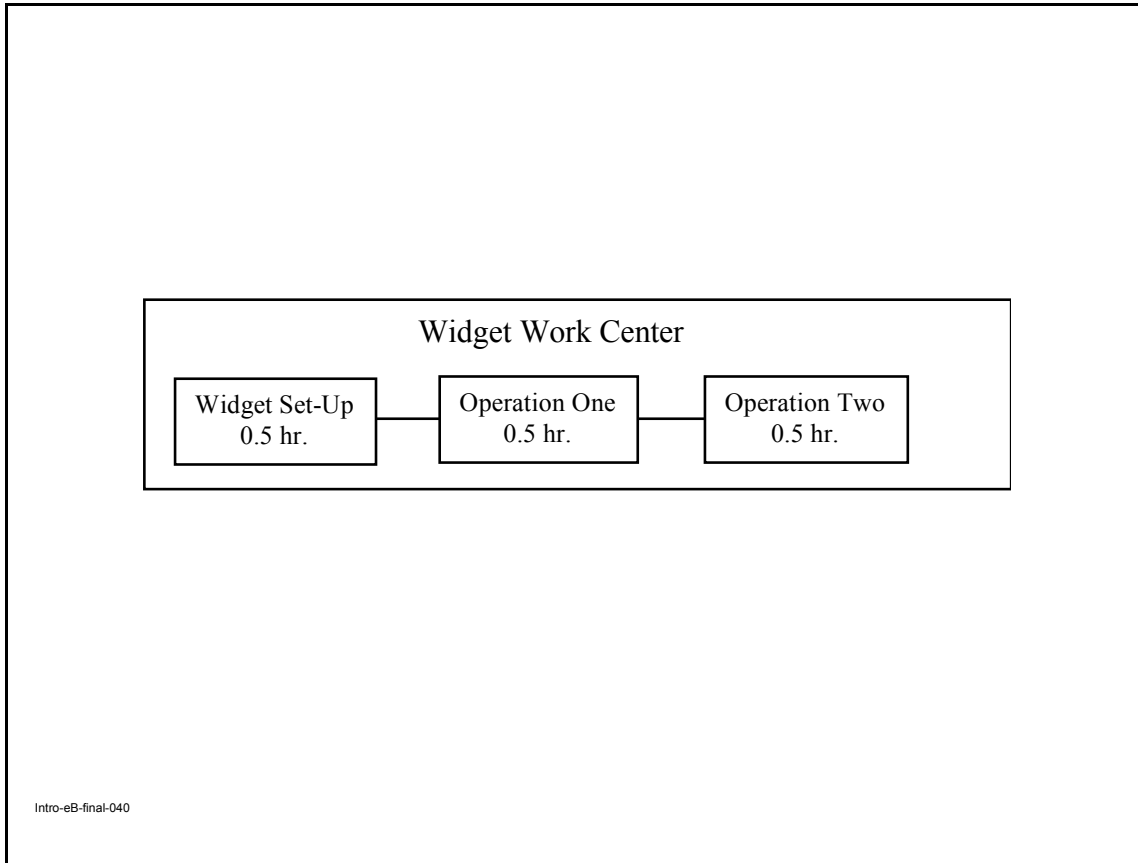
Intro-eB-final-020

- 2 You have one work center for widget making.
- 3 You pay your labor USD 35 per hour for set up and USD 25 for run time labor.
- 4 Your labor burden percent is 100%.
- 5 Your site works 8 hours per day Monday through Friday.
- 6 Check your calendar.

- 7 Add a department and work center.
- 8 Widgets are made from two gizmos, one flinking pin, and a gapper gasket. Create two product lines, one for your end item and one for your purchased components.
- 9 Add the items to your database and create the product structure.



- 10 Making widgets requires one half-hour of set up. Each half-hour of set up time allows you to make an order of 25 widgets.
- 11 The assembly of widgets involves two operations:
 - a Assembling the flinking pin with the gapper gasket into a gizmo takes one half-hour.
 - b Fitting the second gizmo to the other end of the flinking pin requires another half-hour.
- 12 Create the item route.



Item Planning Data

- 1 Set the order policy to POQ for all items.
- 2 Verify other data to ensure Material Requirements Planning (MRP) will be successful.
- 3 Purchased items all have a lead time of one day and do not require inspection.

Checkpoint: Use your inquiries to ensure that your data is correct. Ask for verification if you are not sure.

Set up Customer Address Records

Instructions: You sell Widgets for USD 100 EA. The standard credit terms in your industry are 2% discount if paid within 45 days, balance due in 60 days.

- 1 Create records for Willie's Widgets Works and Wanda's House of Widgets.
- 2 Give each of your customers a USD 100,000 credit limit.
- 3 Give each customer a 10% discount.

Set up Supplier Address Records

Instructions: The Flinking Gizmo Gasket Group is the sole source for all your components. They charge you USD 10.00 each. for gizmos, USD 1.00 for pins, and USD 10.00 for a case of 100 gaskets.

- 1 Do you need a unit of measure conversion for gaskets? Your supplier gives you the same credit terms and discount structure you give your customers.

Checkpoint: Do supplier and customer inquiries to verify that your data is correct. Ask for assistance if unsure.

Cost Roll Up

- 1 Roll up your route and product structure costs for the current cost data set.
- 2 Copy your costs to the GL cost set or otherwise ensure you have a GL Cost Data Set.

Checkpoint: Before printing reports you will want to check appropriate inquiries to make sure your data is complete and correct.

- a Did you correctly roll up your routing and product structure costs?
- b Do you have a valid GL Cost data set for your items?
- c Remember that all GL transactions are at the GL cost.
- d Check your work before proceeding.

Print Cost Report

Print a copy of product structure cost report for all levels for the GL Cost data set. A 100-claim penalty will be charged for reports without your company name.

Profit and Loss: 1,000 clams if all correct

Planning

- 1 Use Forecast Worksheet Maintenance to enter a forecast for widgets.
- 2 Begin next week and add a forecast for three weeks.
Do you have any idea what your capacity is? You should be able to make 35 or 40 widgets a week.
- 3 Check your Master Schedule summary. You are a make-to-stock company and need some inventory to start. Keep in mind how many items you want to make in any period.
- 4 Run MRP.
- 5 Check 22.18 Master Schedule Summary Inquiry or any other summary or detail screen to make sure your plan is valid.
- 6 When you are satisfied with your planned orders, approve orders for the first week of your plan.
- 7 Place purchase orders or one purchase order (PO) with three line items for the purchased items.
Valid PO receipts are required for all purchased items in quantities to support your production plan.
Your system will be audited for unplanned transactions.
- 8 Print a PO receipt for each of your receipts or a purchase receipt report for all three of your items.

Profit and Loss: 500 clams for a correct PO receipt report

- 9 After you have received your purchased items, you may release your MRP planned work orders. Release only enough work orders for the first week of your schedule.
- 10 Print a valid work order with picklist and routing. This must be an MRP planned work order.

Profit and Loss: 500 clams if correct

- 11** Do work order issues for the components.
- 12** Use shop floor transactions to report labor to the order.
- 13** Use work order receipts to receive the work orders into your finished goods location.
- 14** Run MRP.
- 15** Check your stocks of components and finished goods.
- 16** Check your action messages and planned orders. Can you explain them?
Remember, you do not understand your MRP result until you understand your action messages. Be sure to check your inquiries before printing a report.

Checkpoint: Print an MRP summary report for all items. It must show at least three weeks of forecast—one week of production on-hand in inventory, and planned orders for at least two more weeks of production to your support forecast.

Profit and Loss: 1,000 clams for a satisfactory MRP summary report

Enter Your First Sales Orders

Instructions: You receive your first orders from customers. Each of your customers wants 25 widgets by the end of next week and 30 more widgets by the end of the following week.

- 1** Enter these sales orders.
- 2** Ship the first of each customer's orders. Do you have enough stock?
No? Ship what you can.
Will you ship both orders short some or one order complete and the other short a lot?
- 3** You must print and post invoices before you can collect payment. We will pay 500 clams each for two correct sales order invoices as shown on an invoice post report.

Profit and Loss: Total 1,000 clams for an invoice post report

Run MRP

- 1** Check action messages.
- 2** Review your MRP or Master Schedule summary inquiry.
What is your projected stock position? Do you need to adjust forecast?

- 3 Take appropriate action with your planned orders to ensure supply in future periods.
- 4 Apply customer payments in Accounts Receivable.
We will pay for correct application of a customer payment.

Profit and Loss: 500 clams each for payment of the two outstanding invoices

- 5 Print the Payment Register 27.6.6.

Profit and Loss: 1,000 clams total for AR payment application

- 6 All your suppliers have invoiced you for their first shipments to you. Voucher your supplier invoices in AP. Select these vouchers for payment and print checks.
We will pay you 1000 clams for a Check Status Report 28.9.17.

Profit and Loss: 1,000 clams total for AP payment

- 7 At this point you should be able to post your transactions to the general ledger and print an income statement and a balance sheet.

Profit and Loss: 2,000 clams for a valid income statement and balance sheet

Capacity Planning

Instructions: Your widgets are a success. Wanda's Widgets places an order for 100 widgets per week for six weeks starting four weeks from today. Willie's Widgets wants 125 per week for seven weeks starting next week.

- 1 Put these orders into the system.
- 2 Extend your total forecast for an additional two weeks—five weeks total. This forecast must be at least twice the previous forecast.
- 3 Run MRP.
- 4 Run CRP. What is the load in your work center? Do you have enough capacity? If not how can you adjust it? Do you add men/machines in the work center record or change the calendar, or both? You must balance your load.

Profit and Loss: 1,000 clams for balanced CRP load profile report

Extra Credit

- 1 Set up a second site to handle distribution.
Make sure you set this site up with a unique address code in the address master file.
- 2 At this site widgets are a DRP item, sourced from your manufacturing site.
- 3 You will need a network code and a new forecast for this site.
- 4 This site expects to ship more than 500 widgets per week, starting in two weeks.
- 5 Run DRP at your new site.
- 6 Run MRP at your manufacturing site.
- 7 Verify that your inter-site requests have created a load at your manufacturing site.

Profit and Loss: 1,000 clams for a valid Inter-site request report from your new site

- 8 The demand from your new distribution site is way beyond your ability to produce using current methods. You decide to invest in automation. Set up a production line to make widgets.
- 9 Set the hourly line rate to cover the expected range of volume based on the volume you are now forecasting.
- 10 Modify your product structure and routing for repetitive scheduling.
- 11 Use line sequencing to schedule some of your MRP planned orders as a repetitive schedule.
- 12 You will need to do additional PO receipts in order to support more production with components.
- 13 Use the backflush transaction to report several days' production as complete.
- 14 Ship at least one distribution order to your new distribution site.
- 15 Ship several of your customer sales order lines early.

Profit and Loss: 1,000 clams for a valid cumulative order cost report

- 16 Invoice your recent shipments.
- 17 Apply customer payments.
- 18 Voucher and pay for your recent purchase receipts.

Sales Analysis

- 1 Run a sales analysis report by customer.

Which of your customers has given you the largest revenue? The largest margin?

Profit and Loss: 1,000 clams for a valid sales analysis report

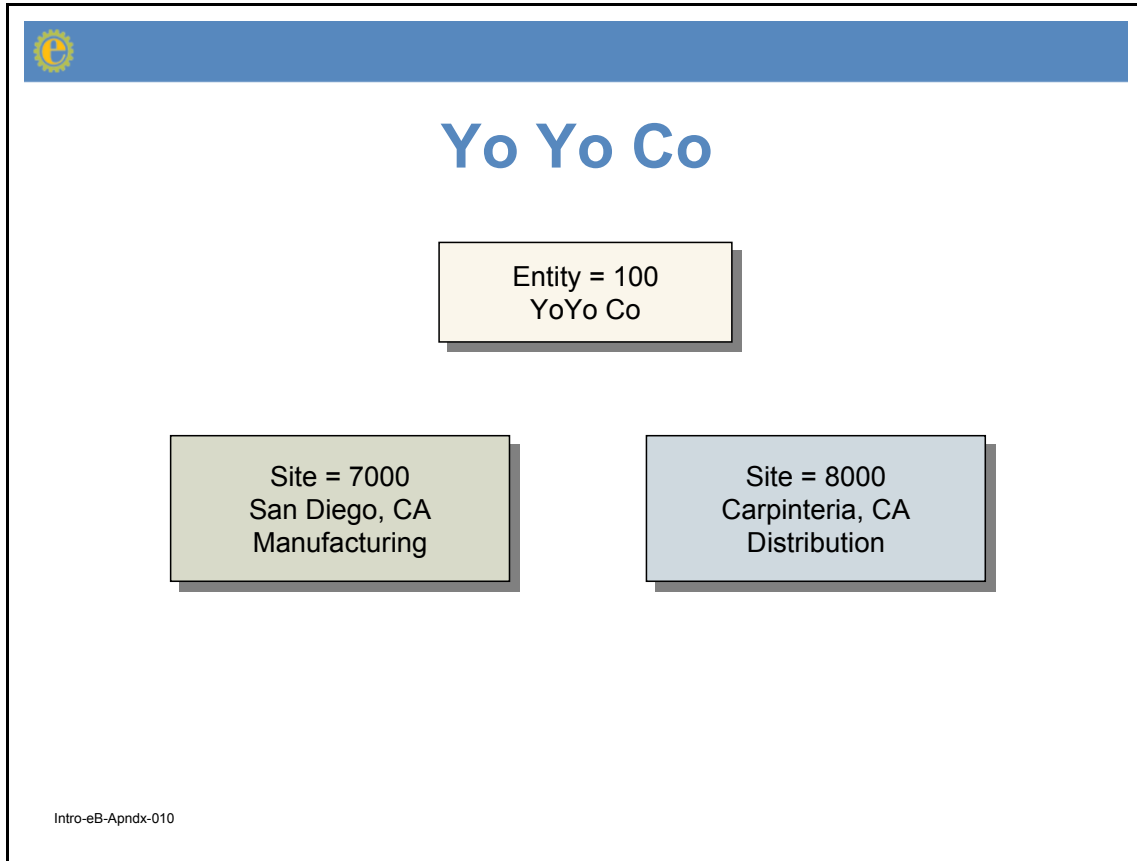
Self-Evaluation

You started this activity with 1,000 clams. You could have earned an additional 12,000 clams for a total of 13,000 clams. How many clams do you have?

APPENDIX B

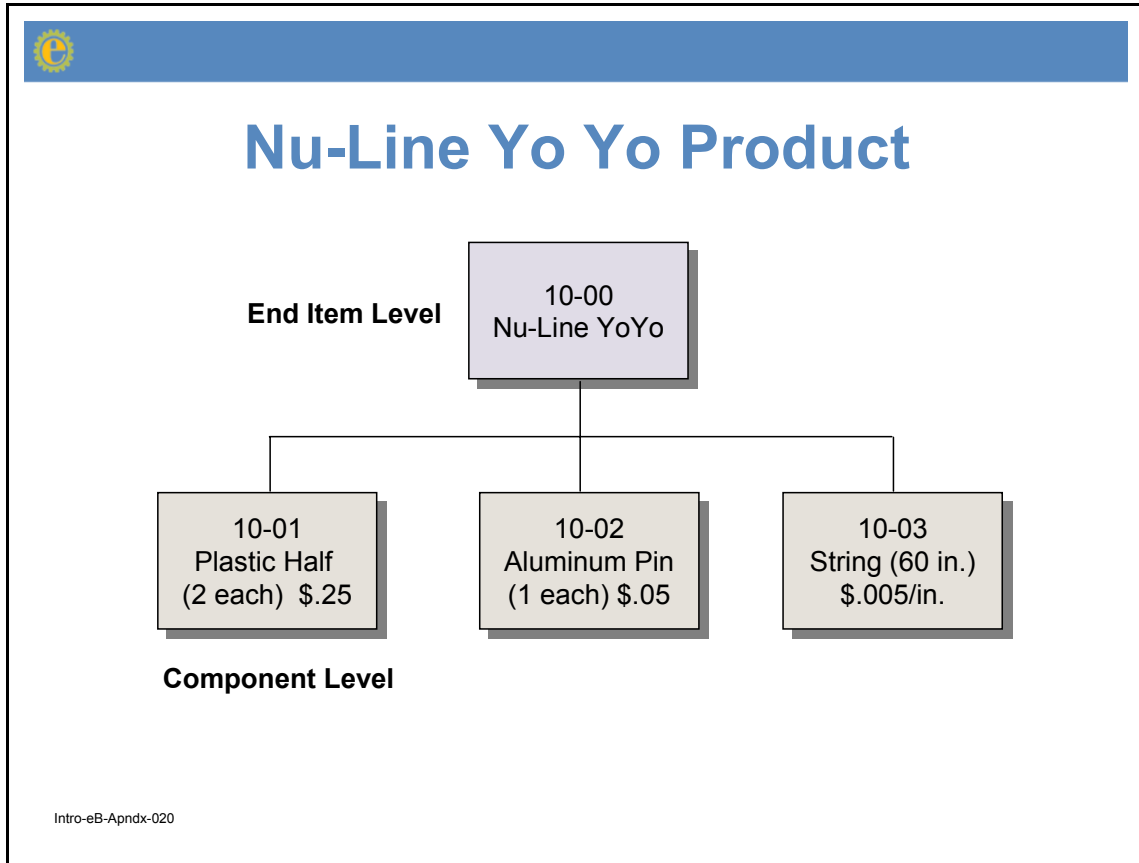
Yo Yo Co.

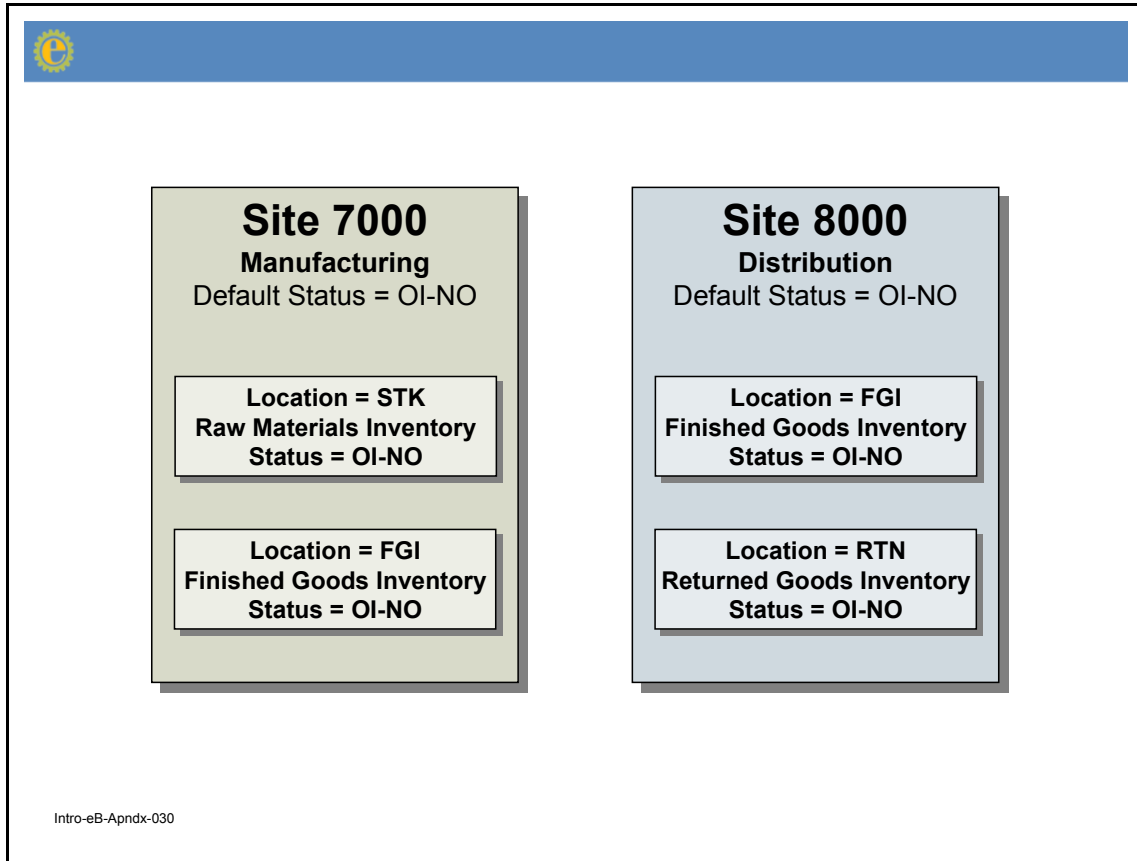


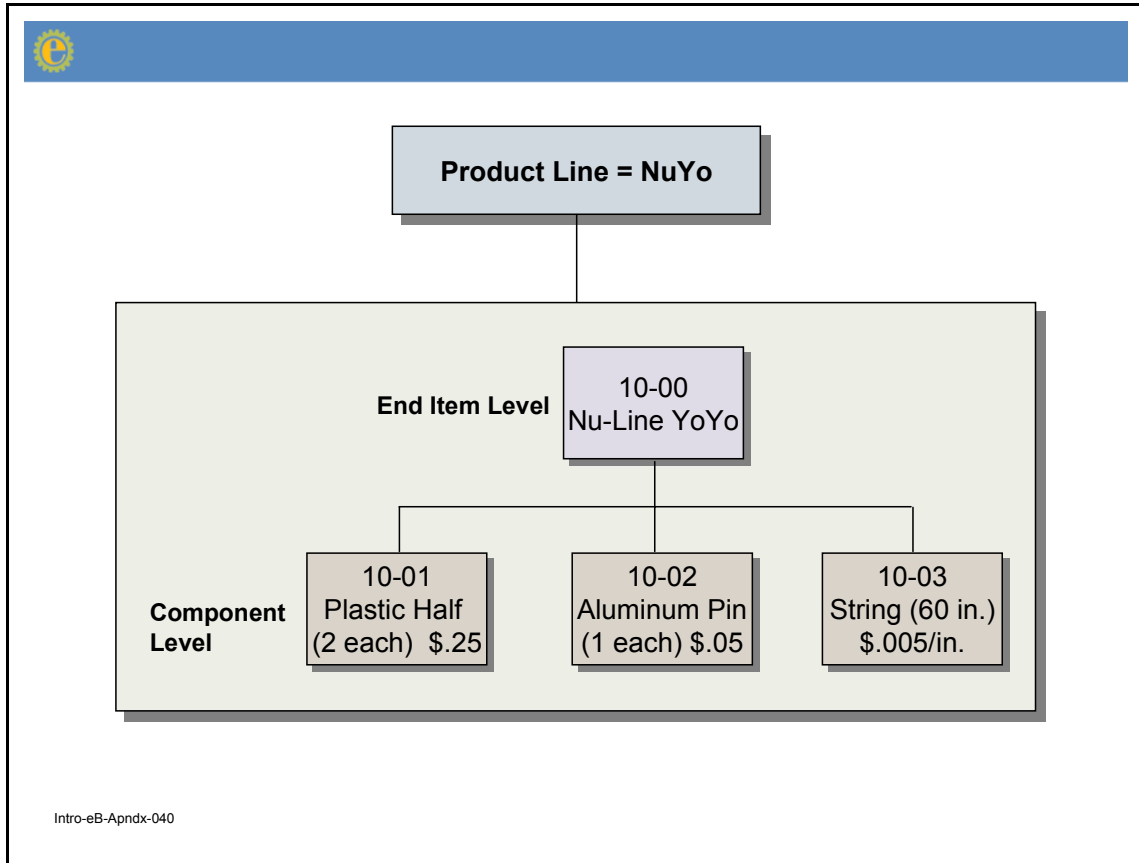


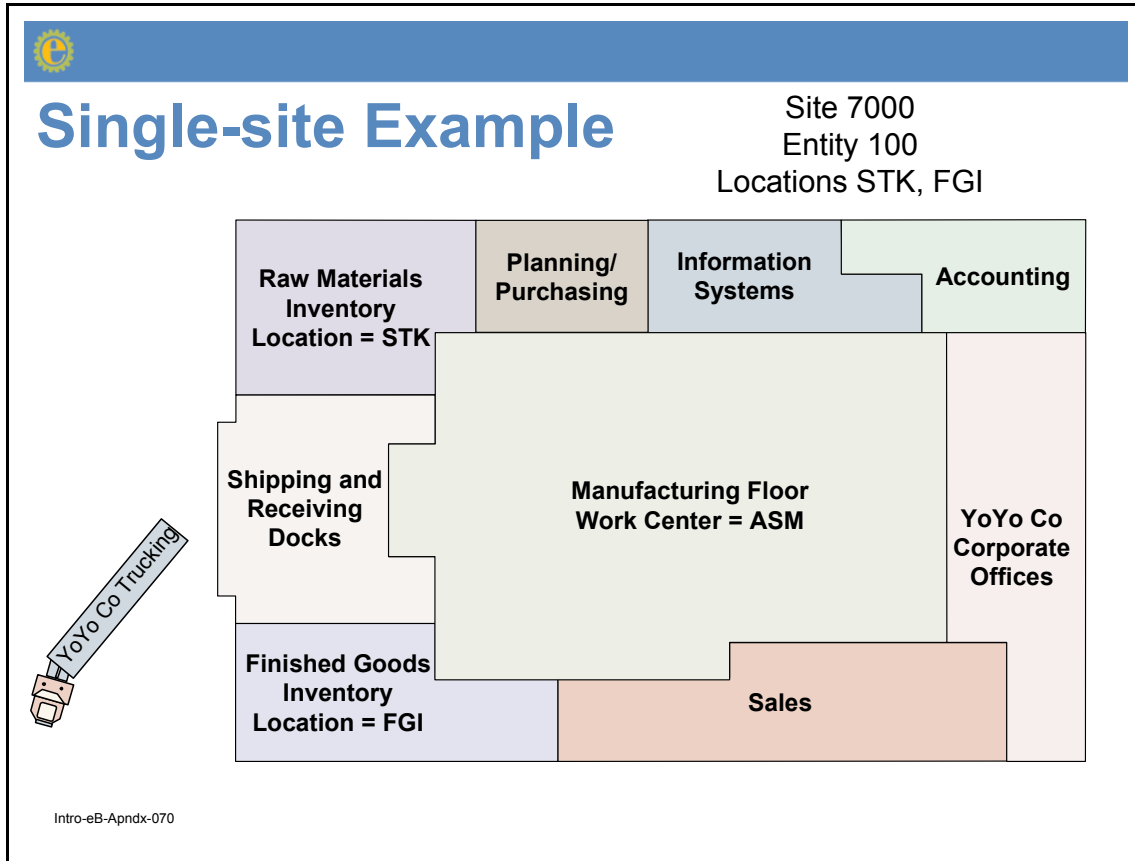
Sample Company

Instructions: Use the data in this appendix to set up a sample company.







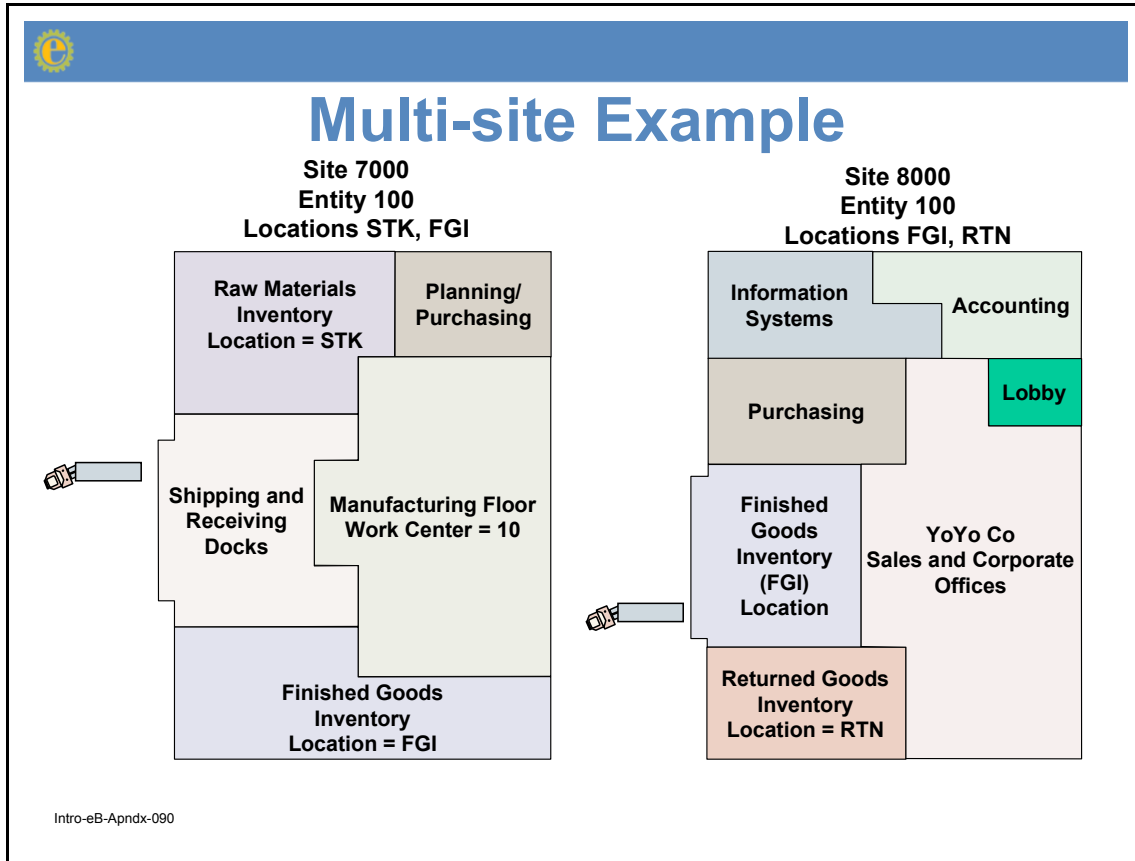




Nu-Line Yo Yo Cost Calculations

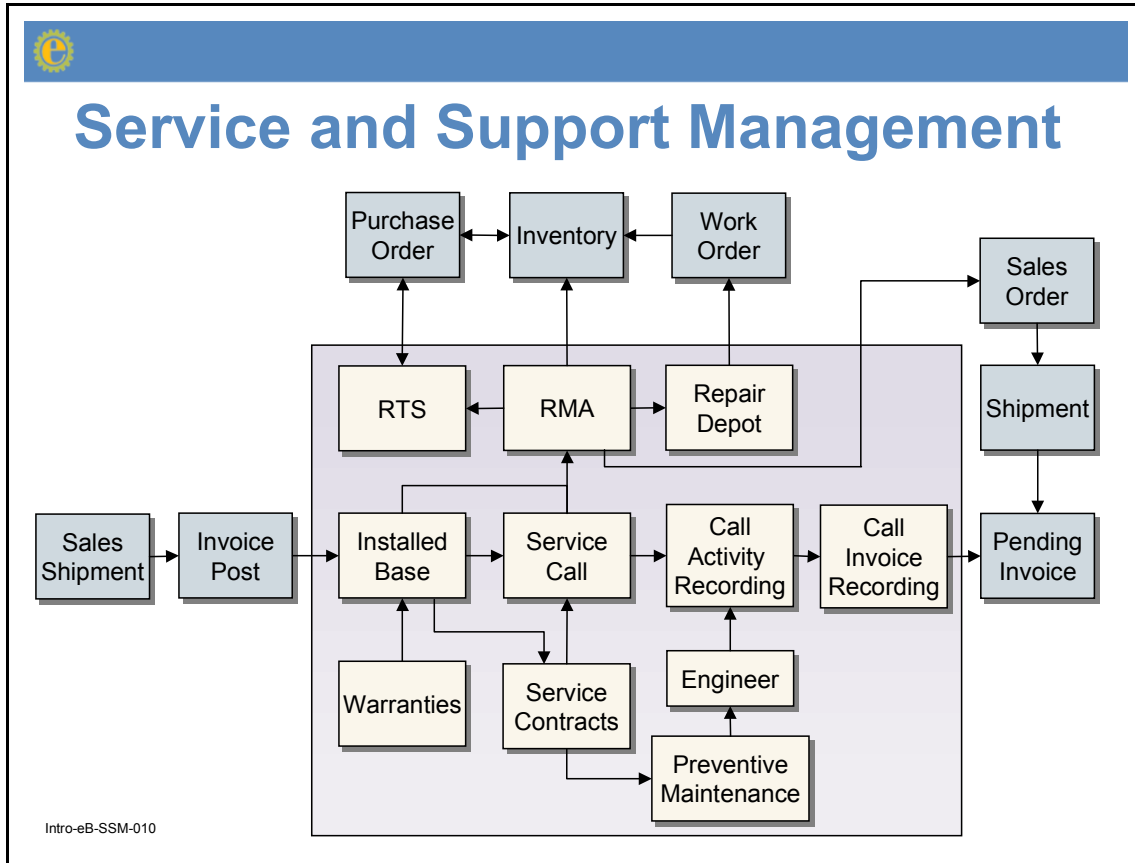
Materials			
Plastic Half	= 2	@ .25	= .50
Aluminum Pin	= 1	@ .05	= .05
String	= 60	@ .005	= <u>.30</u>
Total Materials			.85
Labor & Burden			
Setup Time	= 1.0	@ \$10 per hour ÷ 100 Order Qty	= .1
Run Time Op 10	= 0.05	@ \$10 per hour	= .5
Run Time Op 20	= 0.0333	@ \$10 per hour	= <u>.333</u>
Total Labor			= .933
Total Burden	=	40% x .933	= <u>.3732</u>
Total Labor & Burden	=	1.3062	
Total Cost (in dollars)			= 2.1562

Intro-eB-Apndx-080



APPENDIX C

MFG/PRO eB Service/Support Management

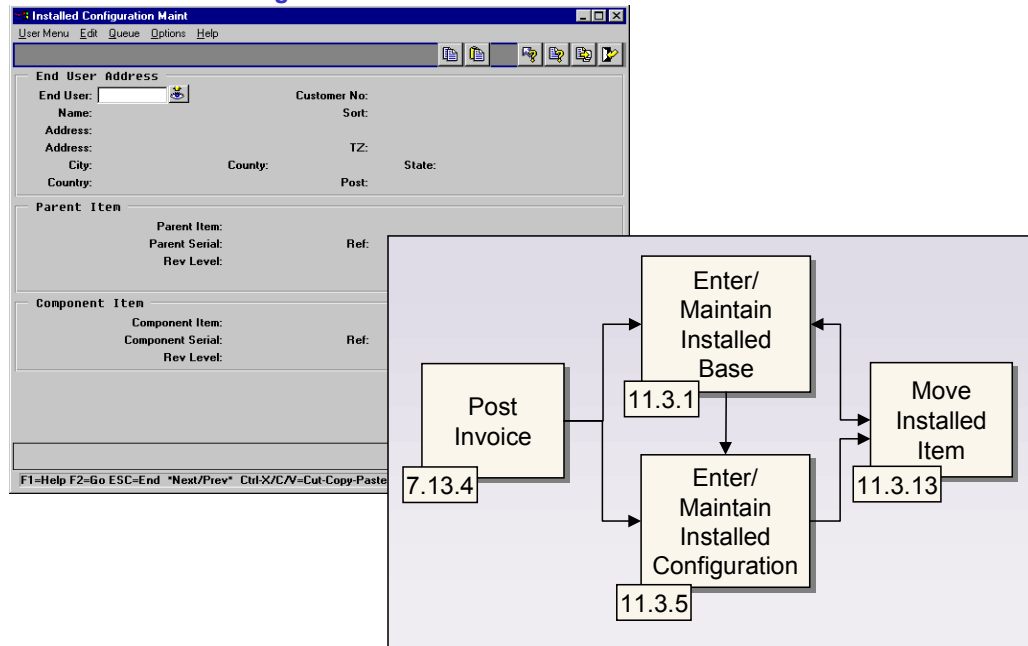


Service and Support Management (optional)

The customer relationship often does not end when the product is sold. Products must be repaired and serviced, and questions answered. This is where Service/Support Management comes in.

Installed Base

11.3.5 – Installed Configuration Maintenance



Intro-EB-SSM-020

Installed Base

- Installed base

Each item you service can be recorded in the installed base, providing the foundation for effective customer service.

- Warranties and service contracts

Service for installed items may be warrantied or provided according to a service contract's terms and conditions.

Warranties and service contracts specify such things as hours and days of coverage, response time, and duration.

You can specify different levels of coverage for various service activities.

- Call tracking and dispatching

Call tracking functions record and dispatch each call according to predetermined rules and engineer schedules.

Calls can be progressively escalated if not resolved within a certain amount of time.

Call Activity Recording tracks items, labor, and expenses used in servicing a call as well as any items returned from the end user.

- Returns and repairs

If a product is being returned for repair, replacement, or credit, a return material authorization (RMA) authorizes the return.

Once returned, the items are moved internally to manufacturing, shipping, or invoicing.

If the item is under warranty from your supplier, a return to supplier (RTS) can be processed and tracked.

- Service inventory

Service Engineer Orders replenish an engineer's inventory, order items for a call, or manage service floor stock, such as cleaning supplies.

- Service billing

Each service and support action may have billing impact.

Call Activity Recording tracks labor, materials, and travel costs and expenses related to a call, and can generate a pending invoice.

A pending invoice also can be generated and reviewed in Call Invoice Recording.

Invoices for service contracts are generated when a contract is released to billing.

RMA invoices, like sales orders, are generated after shipment or receipt of items.

Invoices are printed and posted in the Sales Orders/Invoices module.

Installed Base from Sales

The service process can begin as soon as a sales order is shipped and invoiced. This can optionally update the installed base in the Service/Support Management module, recording the item, its serial number, and the customer Ship-To.

A flag in the Service Management Control File 11.24 determines whether shipments update the installed base.

Item configurations can also be recorded automatically, based on either the configuration selected on a sales order or transaction history from work orders.

Install Call

Posting a sales order invoice can also generate an automatic installation call if the item has been marked as requiring installation by an engineer.

Items are normally added to the installed base only if Installed Base is set to Yes for the item and Create ISB is set to Yes for the end user.

Warranty Registration

Not all companies update the installed base directly from sales.

When and how the installed base is updated depends largely on the type of company and product.

Companies that sell through distributors would probably wait until they received a warranty registration card from the end user.

Service Items Only

Normally, only service items are posted to the installed base. For example, a company selling laser printers would want to track the printer unit and any memory boards or chips, but they would not need to track the toner cartridge, paper tray, or supply items they ship.

Each individual item can be identified as a service item in Service Item Maintenance 11.3.7.

Field Notifications

Some organizations track an installed base to facilitate product recalls.

Service/Support offers a set of field notification functions that enable users to manage and control the recall process for installed base items.

Field notifications are used in conjunction with the Call Generator, which generates a number of calls with similar attributes at one time.

Once established, installed base information is changed manually or automatically by processing RMA invoices or during call activity recording.

Warranties

11.3.15 – Warranty Type Maintenance

Warranty Type: W-1 Description: Standard 90 Day Warranty

End User Type:

Prod Line: SCRG Restocking Charge: 0.00%

Duration: 90 Call Price List: RMA Only: no

Response: 4 Credit Price List: RMA-CR Comments: no

Response Time UM: Ship Before Return: yes Priority: 0

Warranty Coverage

	Start	End
SUN: no	00:00	00:00
MON: yes	08:00	16:00
TUE: yes	08:00	18:00
WED: yes	08:00	18:00
THU: yes	08:00	18:00
FRI: yes	08:00	18:00
SAT: no	00:00	00:00
Holidays: no	00:00	00:00

Specify:

- Duration
- Terms
- Coverage conditions

F1=Help F2=Go ESC=End F5=Delete Ctrl-X/C/V=Cut-Copy-Paste

Intro-eB-SSM-030

Warranties

Installed items may be covered under a warranty. Each service item can be assigned a default warranty in Service Item Maintenance 11.3.7. General warranty information includes:

- Duration and response time
- Default priority for service calls
- Coverage hours and days, including or excluding holidays
- Price lists and restocking charges
- Levels of coverage

Determine percent of service costs customer is responsible for paying, if any, for various service activities

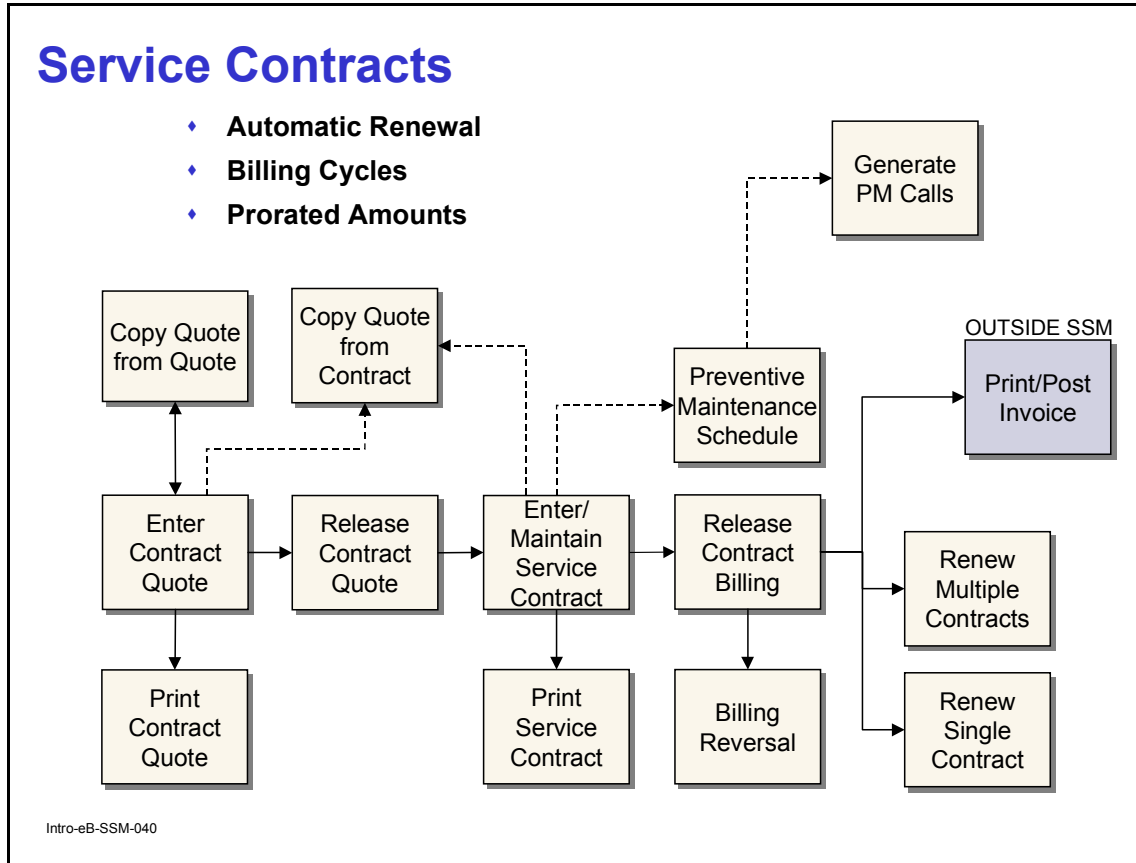
End User Types

Warranties can be set up by end user type, enabling you to tailor warranty conditions for various categories of end users.

For example, calls from certain kinds of end users can be given a higher priority or a shorter response time.

Ship Before Receive

In addition, each warranty can specify whether or not replacement items can be shipped out before you get the defective item back from the customer. For critical items, Ship Before Receive would be Yes. Set this to No for most others.



Service Contract Type

When the warranty runs out, many companies sell a service contract. Both service quotes and contracts can be generated in MFG/PRO eB. These specify the cost, terms, and conditions for such things as phone support, field repairs, and maintenance.

Each service quote or contract is based on a contract type, which is set up like a warranty and specifies the duration and coverage offered.

Creating Contracts

When service quotes and contracts are entered, the levels and limits of coverage associated with the contract type can be copied into the contract, enabling you to track consumption against those limits in Call Activity Recording 11.1.1.13.

Line items can be entered or generated based on open sales quotes, sales orders, or installed base item information. Each line item specifies a service type, the item to be covered, and the start/stop date of coverage.

Quote-contract Process

The service quote/contract cycle is similar to the sales quote/sales order cycle. A customer can be provided with a quote first. Once accepted, it is released to create a service contract.

One or more invoices can be generated against any service contract, depending on the billing cycle used.

Billing Cycles

Typically, service contracts are invoiced on some preset billing cycle—yearly, quarterly, or monthly.

The billing cycle is specified on each service contract, and service contracts are released for invoicing according to this billing cycle.

The release creates invoices in the Sales Orders/Invoicing module. These invoices are then printed and posted to AR like any other sales invoice.

Preventive Maintenance

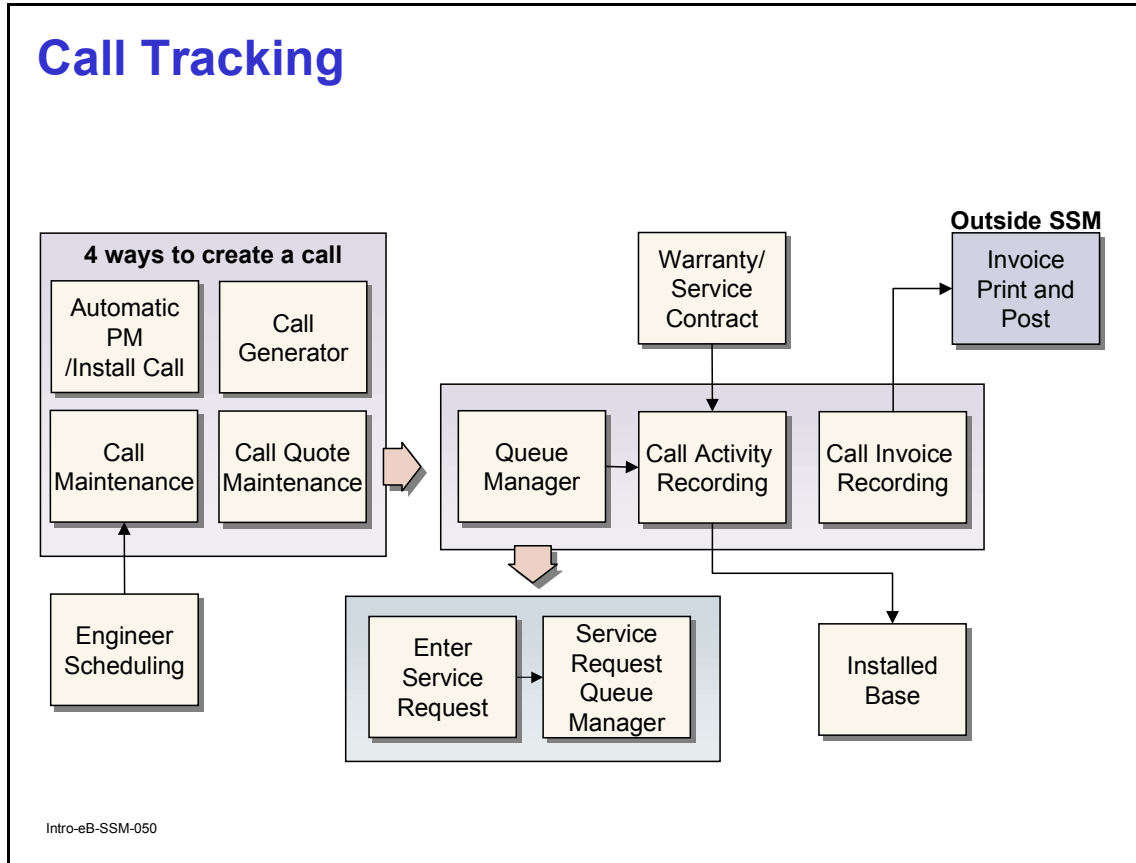
Service contracts can also identify a preventive maintenance (PM) schedule associated with each item.

Calls can be generated to perform PM as part of contract maintenance, or a group of scheduled calls can be generated at one time using the Call Generator utility.

Both PM routings and product structures (BOMs) can be set up and used, with perhaps differences for various types of visits (a three-month checkup may differ from a nine-month checkup).

Contract Renewal

Fully billed contracts can be renewed either one at a time or as a group. During renewal you can update prices and limit information. When contracts are renewed as a group, contract quotes can be created for review and then released when approved, or the renewal can be completed directly.



Call Tracking

In general, all communications between you and the customer for matters concerning service begin with a call. When a call comes in, it is recorded in Call Maintenance 11.1.1.1 along with relevant details.

This record includes the item, the end user, and a description of the problem. Calls are categorized and prioritized according to type and severity. A problem type or skill code can also be entered (electrical, mechanical, information only).

Call Queue

Each call is assigned to a call queue. This directs the call to the appropriate department or queue manager. All calls coming in to a given queue can be reviewed on screen and dispatched to an engineer or other service representative.

Engineer Scheduling

The individuals responsible for resolving calls are set up as service engineers. Engineer scheduling can be used to streamline the assignment of the most appropriate engineer to a call.

Each organization can specify how various factors should be weighed in scheduling. Automatic paging can be used to notify an engineer when a call is assigned.

Call Escalation

To ensure that calls are resolved promptly, call escalation procedures can be set up and invoked automatically once a specific time period has elapsed.

Service Requests

Some calls are resolved immediately. Others may take longer, such as those requesting a product enhancement or design change.

A service request (SR) can be generated for this type of call. SRs are typically used for internal request tracking, providing a forum by which customer service personnel can open a dialog with design engineers and quality personnel.

Calls involving similar problems can be addressed together using one service request.

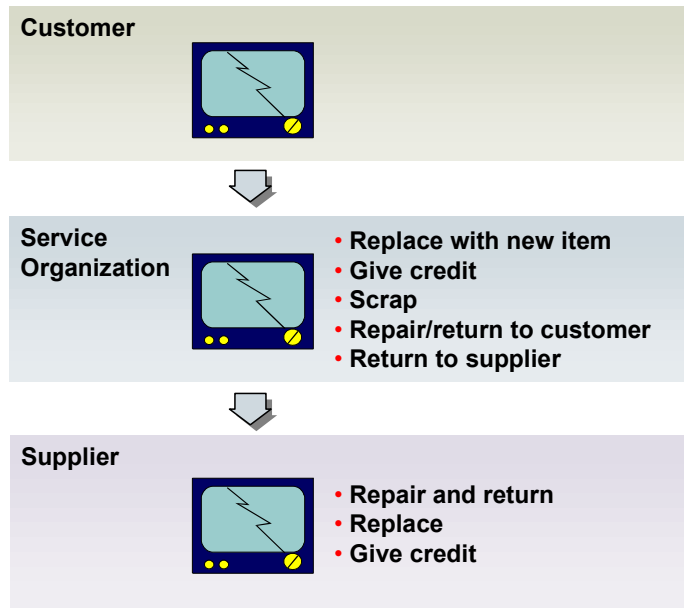
Call Activity Recording and Invoicing

Engineers record the details of service activity related to a call in Call Activity Recording (CAR), 11.1.1.13. As details are recorded, the terms and conditions of the warranty or contract in effect are applied.

This information becomes the basis for generating an invoice, either directly from CAR or later from Call Invoice Recording (CIR). CIR provides both high-level summary views and detailed information about billing activity.

The call invoice is printed and posted in the Sales Orders/Invoices module.

Returns and Repairs



Intro-eB-SSM-060

Return Material Authorization (RMA) and Return to Supplier (RTS)

When the customer sends in a defective product, this is managed using an RMA document. Returns related to service on a call are handled with Call Activity Recording. There are various ways of handling a return, depending on the situation:

1 Return for credit

The customer may simply return the product for credit. They do not want it to be replaced.

In this case, you create an RMA to manage the return, generate a credit invoice (less any restocking charge), and deal with the returned item. It may be scrapped, repaired, or returned to your supplier.

2 Repair or replace

The customer may return the product for repair or replacement. In that case, you open an RMA to track the return and the eventual shipment of a replacement.

When the defective product comes in, you have the same choices—scrap it, repair it, or return it to your supplier.

3 Release to work order

If an item is repairable, it can be released to a work order once it has been received on the RMA. This creates a special “rework” work order that is managed in the Work Orders module.

4 Return to supplier (RTS)

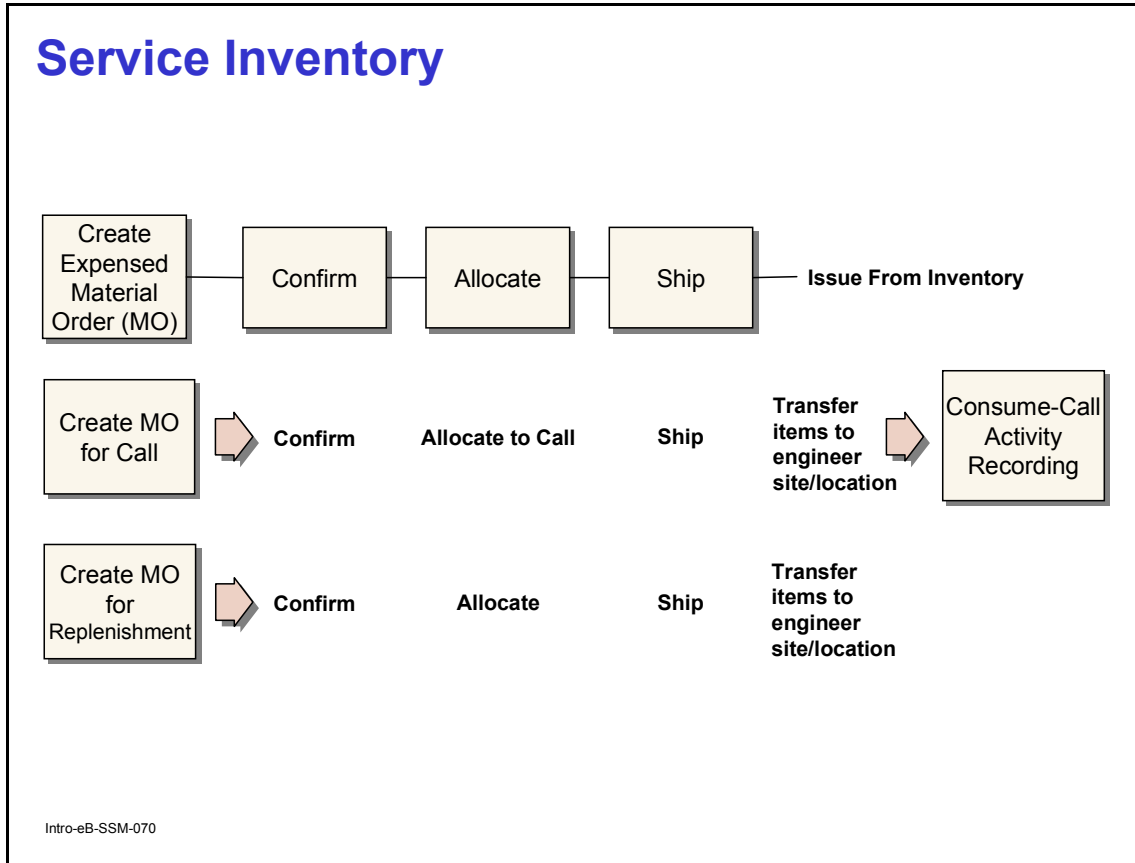
When you return a defective product to the original supplier, you go through the same decision process.

Do you want it to be repaired or replaced, or do you want a credit?

The return to supplier is managed using another document, called an RTS.

This document is like a purchase order. It can be printed, and all inventory transactions are processed against it.

Both RTS receipts and issues generate purchasing receiving history, which can be matched to supplier invoices in Accounts Payable.



Service Inventory

Material Orders (MOs)

Managing service inventory can pose special challenges to a service organization.

Service/Support provides the tools to facilitate this process. All kinds of inventory can be managed, both items tracked individually and items issued in bulk like floor stock.

MOs can manage:

1 Expensed MOs

Items that are not tracked individually, similar to manufacturing floor stock. These items are typically used in bulk, like screws or washers, without any detailed usage tracking. MOs used in this way are called “expensed” MOs.

2 MO for a call

Inventory that is required for a specific call, making those items available for use when service details are recorded in Call Activity Recording.

3 Inventory replenishment: inventory moving between a supply center and service locations

The supply center is typically a central supply center, or one dedicated to service activity.

Locations are typically remote locations such as engineers in the field carrying truck stock or a remote service center, although the items may simply be issued to a service location within a manufacturing site.

MO Life Cycle

MOs have a life cycle similar to a standard sales order, except that no billing is involved. The internal movement of goods in MOs mirrors much of the functionality of the standard MFG/PRO eB shipping and distribution process. Whenever possible, standard MFG/PRO eB programs are used.

This facilitates learning MO functions for the experienced MFG/PRO eB user because familiar processes are being used in a new context.

MOs are created and are either linked with a call for inventory replenishment or expensed. The shipment of items can take place directly when the MO is created, if the order is allocated and confirmed.

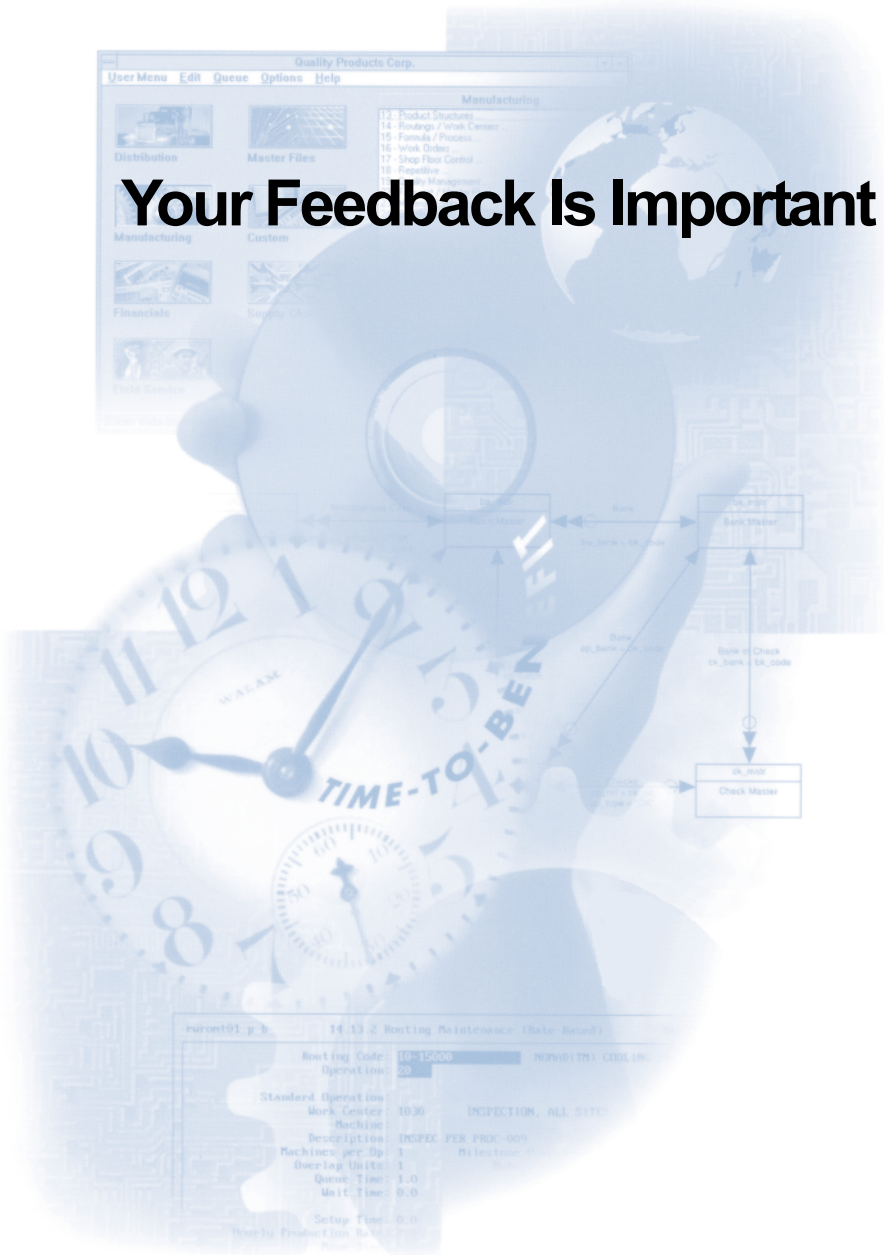
Expensed MOs are issued out of inventory. Otherwise, the “shipment” is actually an inventory transfer from one site/location to another.

If the items are not shipped immediately, separate allocation, confirmation, and shipment functions can be executed, which are all very similar to their counterparts in the Sales Orders module.

A packing list for an MO can be generated in the Sales Orders/Invoices module.

A delivery note is created as part of the shipment.

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Item number: 70-2814B

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