Contents

Foreword
Acknowledgments
About the Author

Chapter 1  Introduction
Why Is There a Need for This Book?
Who Can Benefit from Reading This Book?
The Need for Universal Data Models
A Holistic Approach to Systems Development
What Is the Intent of This Book and These Models?

Conventions and Standards Used in This Book
Entities
Subtypes and Supertypes
  Non-Mutually Exclusive Sets of Subtypes
Attributes
Relationships
  Relationship Optionality
  Relationship Cardinality
Foreign Key Relationships
Foreign Key Inheritance
Intersection or Association Entities to Handle Many-to-Many Relationships
Exclusive Arcs
Recursive Relationships
Physical Models
Conventions Used for Illustration Tables
Conventions Used to Reference Figures
The Companion CD-ROM

Chapter 2  People and Organizations
Organization
Person
  Person—Alternate Model
Party
  Party Roles 33
  Organization Roles 35
  Common Party Role Subtypes 36
  Should Roles Be Defined at the Time of the Transaction? 36
  Party Role Example 37
  Role Types throughout This Book 37
Party Relationship
  Party Relationship Examples 44
  Party Relationship Information 46
  Status Types 47
Party Contact Information
  Postal Address Information 49
  Geographic Boundaries 51
  Party Contact Mechanism—Telecommunications Numbers and Electronic Addresses 53
  Party Contact Mechanism (Expanded) 54
  Contact Mechanism Purpose 56
  Facility versus Contact Mechanism 58
  Party Communication Event 58
  Communication Event Follow-Up 63
Summary 67

Chapter 3  Products
  Product Definition 70
  Product Category 71
  Product Identification Codes 75
  Product Features 76
    Product Feature Interaction 78
    Product Feature Subtypes 78
    Product Feature Examples 79
  Unit of Measure 80
  Suppliers and Manufacturers of Products 81
  Inventory Item Storage 84
  Product Pricing 87
    Pricing Subtypes 87
    Price Component Attributes and Relationship to Product or Product Feature 89
    Pricing Factors 89
    International Pricing 91
    Example of Product Pricing 91
  Product Costing 93
  Product to Product Associations 96
    Products and Parts 100
Summary 104

Chapter 4  Ordering Products
  Standard Order Model 106
  Order and Order Items 109
Order Parties and Contact Mechanisms
  Sales Order Parties and Contact Mechanisms
    Party Placing Order and Related Contact Mechanism
    Party Taking Order and Related Contact Mechanism
    Ship-to Party and Contact Mechanism
    Bill-to Party and Contact Mechanism
  Person Roles for Orders
Purchase Order Parties and Contact Mechanisms
Generic Order Roles and Contact Mechanisms
Order Adjustments
  Order Status and Terms
  Order Status
  Order Terms
Order Item Association
Optional Order Models
Requirements
  Requirement Roles
  Requirement Status
  Product Requirements
  Order Requirement Commitments
  Requirement Example
Requests
  Request
  Request Items
Quote Definition
  Quote Roles
  Quote
  Quote Items
  Quote Terms
Agreement Definition
Agreement Item
Agreement Terms
Agreement Pricing
Agreement to Order
Summary

Chapter 5  Shipments
Shipments
  Shipment Types
    Shipments Parties and Contact Mechanisms
Shipping Detail
  Shipment Status
Shipment-to-Order Relationship
Shipment Receipts
Item Issuance for Outgoing Shipments
Shipment Documents
Shipment Routing
  Shipment Vehicle
Summary
## Chapter 6  Work Effort  185
- Work Requirement and Work Efforts  186
- Work Requirement Definition  186
  - Requirement Types  188
  - Anticipated Demand  190
  - Work Requirement Compared to Order  190
- Work Requirement Roles  191
- Work Effort Generation  193
  - Work Effort Type and Work Effort Purpose Type  195
  - Work Effort Attributes  195
  - Fulfillment of Work Requirements  196
  - Work Effort and Facility  198
  - Work Effort Generation—Alternate Model  198
- Work Effort Associations  200
  - Work Effort Association Definition  200
  - Work Effort Dependency  203
  - Work Efforts and Work Tasks  203
- Work Effort Party Assignment  203
  - Work Effort Party Assignment  205
  - Party Skill and Skill Type  206
  - Work Effort Status  207
  - Work Effort Party Assignment  207
  - Work Effort Role Type  208
  - Work Effort Assignment Facility  209
- Work Effort Time Tracking  209
- Work Effort Rates  211
  - Work Effort Assignment Rate  214
- Inventory Assignments  215
- Fixed Asset Assignments  217
  - Fixed Asset  218
  - Fixed Asset Type  218
  - Fixed Asset Assignment and Status  219
- Party Fixed Asset Assignments  220
- Work Effort Type Standards  221
  - Work Effort Skill Standards  223
  - Work Effort Good Standards  223
  - Work Effort Fixed Asset Standard  224
- Work Effort Results  224
- Summary  227

## Chapter 7  Invoicing  229
- Invoices and Invoice Items  230
- Invoice Roles  234
- Billing Account  237
- Invoice Specific Roles  240
- Invoice Terms and Status  242
  - Invoice Status  242
  - Invoice Terms  244
- Invoice and Associated Transactions  244
  - Billins for Shipment Items  245
Billing for Work Efforts and Time Entries
Billing for Order Items
Payments
Financial Accounts, Deposits, and Withdrawals
Summary

Chapter 8  Accounting and Budgeting

Chart of Accounts for Internal Organizations
General Ledger Accounts and Types
Organization GL Account
Accounting Period
Accounting Transactions Definition
Business Transactions versus Accounting Transactions?
Accounting Transaction
Accounting Transactions and Their Related Parties
Accounting Transaction Details
Transaction Detail
Relationships between Accounting Transaction Details
Account Balances and Transactions
Subsidiary Accounts
Asset Depreciation
Budget Definition
Budget
Budget Item
Budget Status
Budget Revision
Budget Review
Budget Scenarios
Usage and Sources of Budgeted Amounts
Commitments against Budgets
Payments against Budgets
Budget Relationship to General Ledger
Budgeted Items versus General Ledger Accounts
Summary

Chapter 9  Human Resources

Standard Human Resources Model
Employment
Position Definition
Position
Position Authorization
Position Type
Position Responsibilities
Position Type Definition
Organization
Position Fulfillment and Tracking
Position Fulfillment
Position Status Type
Hiring Organization
Other Considerations
Chapter 10 Creating the Data Warehouse Data Model from the Enterprise Data Model

The Data Warehouse Architecture

The Enterprise Data Model

The Data Warehouse Design

The Departmental Data Warehouse Design or Data Mart

An Architected Data Warehouse Environment

The Enterprise Data Model

Transformation Requirements

Process Models

High-Level and Logical Data Models

Making the Transformation

Removing Operational Data

Adding an Element of Time to the Warehouse Key

Adding Derived Data

Creating Relationship Artifacts

Changing Granularity of Data

Merging Tables

Creation of Arrays of Data

Organizing Data According to Its Stability

Summary

Chapter 11 A Sample Data Warehouse Data Model

Transformation to Customer Invoice

Removing Operational Data

Adding an Element of Time

Adding Derived Data