



# Contents at a Glance

## PART I

### Introductions and Overviews

|   |  |    |
|---|--|----|
| 1 | An Introduction to Oracle Fusion and the Fusion Technologies ..... | 3  |
| 2 | An Introduction to Oracle JDeveloper and Oracle ADF .....          | 9  |
| 3 | Finding Your Way Around an Application in JDeveloper .....         | 17 |

## PART II

### Building Business Services

|   |  |     |
|---|--|-----|
| 4 | Building ADF Business Components .....         | 27  |
| 5 | The Role of the Entity Object .....            | 41  |
| 6 | View Objects: A Window to Your Data .....      | 59  |
| 7 | The Application Module .....                   | 81  |
| 8 | More View Object Features .....                | 91  |
| 9 | Implementing Business Service Validation ..... | 105 |

## PART III

### Building the User Interface

|    |   |     |
|----|---|-----|
| 10 | Introduction to ADF Faces Rich Client ..... | 127 |
| 11 | Introduction to ADF Model .....             | 141 |
| 12 | Building Typical ADF Faces Pages .....      | 155 |
| 13 | Building Application Flow .....             | 177 |
| 14 | Buttons and Menus .....                     | 195 |
| 15 | Advanced UI Techniques .....                | 203 |

|           |  |            |
|-----------|--|------------|
| <b>16</b> | <b>Data Visualization Components</b> ..... | <b>221</b> |
| <b>17</b> | <b>Building a Reusable UI</b> .....        | <b>241</b> |

**PART IV**  
**Common Coding Patterns**

|           |  |            |
|-----------|--|------------|
| <b>18</b> | <b>Common Business Service Coding Examples</b> ..... | <b>259</b> |
| <b>19</b> | <b>Common UI Coding Examples</b> .....               | <b>269</b> |
|           | <b>Index</b> .....                                   | <b>277</b> |

# Contents

|                       |       |
|-----------------------|-------|
| Foreword .....        | xv    |
| Acknowledgments ..... | xvii  |
| Introduction .....    | xviii |

## PART I

### Introductions and Overviews

|          |  |    |
|----------|--|----|
| <b>1</b> | An Introduction to Oracle Fusion and the Fusion Technologies ..... | 3  |
|          | What Is Fusion? .....  | 4  |
|          | The History of Fusion .....  | 4  |
|          | The Fusion Brand .....   | 5  |
|          | The Fusion Technologies .....                                      | 6  |
|          | Java .....   | 6  |
|          | SOA .....  | 7  |
|          | Web 2.0 .....  | 7  |
|          | Summary .....  | 8  |
| <b>2</b> | An Introduction to Oracle JDeveloper and Oracle ADF .....          | 9  |
|          | Oracle JDeveloper .....  | 10 |
|          | J Is for Java .....  | 10 |
|          | But JDeveloper Is Not Only for Java .....                          | 10 |
|          | Oracle ADF .....   | 11 |
|          | The Role of a Framework .....                                      | 11 |
|          | Model-View-Controller .....  | 11 |
|          | Metadata-Driven Framework .....                                    | 13 |
|          | The Building Blocks of Oracle ADF .....                            | 14 |
|          | Summary .....  | 16 |
| <b>3</b> | Finding Your Way Around an Application in JDeveloper .....         | 17 |
|          | Organizing the IDE .....   | 19 |
|          | Working with Windows .....   | 19 |
|          | Introducing the JDeveloper Windows .....                           | 19 |

## X Quick Start Guide to Oracle Fusion Development

|                                       |    |
|---------------------------------------|----|
| Organizing a Fusion Application ..... | 22 |
| Organizing Your Source Files .....    | 22 |
| Summary .....                         | 24 |

### PART II

## Building Business Services

|          |   |    |
|----------|---|----|
| <b>4</b> | Building ADF Business Components .....                              | 27 |
|          | The Goals for ADF Business Components .....                         | 28 |
|          | How ADF Business Components Works .....                             | 28 |
|          | The Building Blocks of ADF Business Components .....                | 29 |
|          | Introduction to Entity Objects .....                                | 30 |
|          | Introduction to View Objects .....                                  | 31 |
|          | Introduction to Application Modules .....                           | 34 |
|          | First-Cut Business Service Development .....                        | 35 |
|          | Create Business Components from Tables .....                        | 36 |
|          | Testing ADF Business Components .....                               | 38 |
|          | Summary .....   | 40 |
| <b>5</b> | The Role of the Entity Object .....                                 | 41 |
|          | Understanding Entity Objects .....                                  | 42 |
|          | Managing Your Entity Objects .....                                  | 42 |
|          | Creating Entity Objects .....                                       | 42 |
|          | Entity Object Attributes .....                                      | 44 |
|          | Other Entity Object Features .....                                  | 51 |
|          | Associations .....  | 51 |
|          | Creating and Editing Associations .....                             | 51 |
|          | Entity Object Classes .....   | 52 |
|          | The Framework Classes .....   | 53 |
|          | Customizing Entity Object Framework Classes .....                   | 53 |
|          | Summary .....   | 57 |
| <b>6</b> | View Objects: A Window to Your Data .....                           | 59 |
|          | Understanding View Objects .....                                    | 60 |
|          | Managing Your View Objects .....                                    | 61 |
|          | Creating View Objects .....   | 61 |
|          | Managing View Object Attributes .....                               | 63 |
|          | The View Object Query .....   | 64 |
|          | View Object Lookups .....   | 67 |
|          | Implementing Calculated Attributes .....                            | 70 |
|          | Creating View Links .....   | 73 |
|          | Creating a View Link from the Application Navigator .....           | 74 |
|          | Creating a View Link from the ADF Business Components Diagram ..... | 75 |
|          | View Object Classes .....   | 75 |
|          | The Framework Classes .....   | 76 |
|          | Customizing View Object Framework Classes .....                     | 76 |
|          | Summary .....   | 79 |

|          |   |     |
|----------|---|-----|
| <b>7</b> | The Application Module                            | 81  |
|          | Understanding Application Modules                 | 82  |
|          | Managing Application Modules                      | 82  |
|          | Creating an Application Module                    | 82  |
|          | Editing an Application Module                     | 84  |
|          | Application Module Classes                        | 86  |
|          | The Framework Classes                             | 86  |
|          | Customizing Application Module Framework Classes  | 87  |
|          | Summary   | 89  |
| <b>8</b> | More View Object Features                         | 91  |
|          | View Criteria                                     | 92  |
|          | Creating a View Criteria                          | 92  |
|          | Model Driven Lists of Values                      | 97  |
|          | Creating a Model Driven List of Values            | 97  |
|          | Dependent List of Values                          | 100 |
|          | Creating a Dependent Model Driven List of Values  | 101 |
|          | Summary   | 103 |
| <b>9</b> | Implementing Business Service Validation          | 105 |
|          | Creating Validation Rules                         | 106 |
|          | Overview of Adding a Validation Rule              | 107 |
|          | Conditional Execution of a Validation Rule        | 108 |
|          | Failure Handling                                  | 109 |
|          | Compare Validation                                | 111 |
|          | Comparing an Attribute Against a Literal Value    | 112 |
|          | Comparing an Attribute Against an Expression      | 112 |
|          | Comparing an Attribute Against an Attribute Value | 113 |
|          | List Validation                                   | 115 |
|          | Validating Against a Static List of Values        | 115 |
|          | Validating Against a View Object Attribute        | 116 |
|          | Validating Against a Query Result                 | 117 |
|          | Key Exists Validation                             | 118 |
|          | Creating a Key Exists Validator                   | 118 |
|          | Regular Expression Validation                     | 119 |
|          | Creating a Regular Expression Validator           | 120 |
|          | Script Expression Validation                      | 120 |
|          | Creating a Script Expression Validator            | 120 |
|          | Method Validation                                 | 122 |
|          | Creating a Method Validator                       | 122 |
|          | Summary   | 123 |

**PART III**  
**Building the User Interface**

|           |   |     |
|-----------|---|-----|
| <b>10</b> | Introduction to ADF Faces Rich Client .....   | 127 |
|           | An Overview of ADF Faces .....                | 128 |
|           | The Building Blocks of ADF Faces .....        | 128 |
|           | Overview of ADF Faces Components .....        | 129 |
|           | Visual Components .....                       | 130 |
|           | Layout Components .....                       | 133 |
|           | Building Your First Page .....                | 137 |
|           | Creating a JSF Page .....                     | 137 |
|           | Summary .....                                 | 140 |
| <b>11</b> | Introduction to ADF Model .....               | 141 |
|           | The Data Controls Panel .....                 | 142 |
|           | The Building Blocks of ADF Model .....        | 143 |
|           | Data Controls .....                           | 144 |
|           | Binding .....                                 | 147 |
|           | Understanding Expression Language .....       | 152 |
|           | Using EL to Reference Bindings .....          | 152 |
|           | The Expression Builder .....                  | 153 |
|           | Summary .....                                 | 154 |
| <b>12</b> | Building Typical ADF Faces Pages .....        | 155 |
|           | Table UI Component .....                      | 156 |
|           | Using an ADF Faces Table Component .....      | 156 |
|           | Layout Strategies for a Table Component ..... | 159 |
|           | Form Layout .....                             | 163 |
|           | Creating an ADF Form .....                    | 163 |
|           | Editing an ADF Form .....                     | 165 |
|           | Master Detail Layout .....                    | 168 |
|           | Creating a Master Detail Page .....           | 169 |
|           | Search Functionality .....                    | 171 |
|           | Creating a Query Panel on a Page .....        | 171 |
|           | Summary .....                                 | 175 |
| <b>13</b> | Building Application Flow .....               | 177 |
|           | Introduction to Task Flows .....              | 178 |
|           | Creating a Task Flow .....                    | 179 |
|           | Task Flow Types .....                         | 180 |
|           | Task Flow Diagram .....                       | 181 |
|           | Task Flow with Page Fragments .....           | 187 |
|           | Task Flow Trains .....                        | 188 |
|           | Task Flow as Dialogs .....                    | 190 |
|           | Task Flow Parameters and Scope .....          | 192 |
|           | Summary .....                                 | 194 |

|           |  |     |
|-----------|--|-----|
| <b>14</b> | <b>Buttons and Menus</b>                         | 195 |
|           | Adding Buttons to Your Application               | 196 |
|           | Buttons Associated with Business Service Methods | 196 |
|           | Buttons for Application Navigation               | 197 |
|           | Buttons Calling a Method                         | 198 |
|           | Button Labels and Icons                          | 198 |
|           | Adding a Menu to Your Application                | 199 |
|           | Creating a Menu                                  | 200 |
|           | Menu Item Labels and Icons                       | 201 |
|           | Summary  | 201 |
| <b>15</b> | <b>Advanced UI Techniques</b>                    | 203 |
|           | Partial Page Rendering in ADF Faces              | 204 |
|           | Immediately Validating Employee Salary Using PPR | 204 |
|           | Responding to Changes in Other UI Components     | 205 |
|           | Managed and Backing Beans                        | 208 |
|           | The Basics of Managed Beans                      | 208 |
|           | Creating a Managed Bean                          | 209 |
|           | Advanced ADF Faces Components                    | 211 |
|           | Pop-ups  | 212 |
|           | Drag and Drop                                    | 214 |
|           | UI Component Validation                          | 217 |
|           | Other Useful ADF Faces Operations                | 218 |
|           | Summary  | 219 |
| <b>16</b> | <b>Data Visualization Components</b>             | 221 |
|           | Graphs   | 222 |
|           | Bar Graph  | 223 |
|           | Pie Graph  | 229 |
|           | Gauges   | 230 |
|           | Creating a Gauge                                 | 230 |
|           | Setting Gauge Threshold Values                   | 233 |
|           | Hierarchy Viewer                                 | 233 |
|           | Creating a Hierarchy Viewer                      | 234 |
|           | Fine-Tuning the Hierarchy Viewer                 | 235 |
|           | Geographic Maps                                  | 237 |
|           | Creating a Geographic Map                        | 237 |
|           | Summary  | 239 |
| <b>17</b> | <b>Building a Reusable UI</b>                    | 241 |
|           | Page Templates                                   | 242 |
|           | Creating a Page Template                         | 242 |
|           | Using a Page Template                            | 247 |
|           | Declarative Components                           | 249 |
|           | Creating a Reusable Customer Panel               | 249 |
|           | Using a Declarative Component                    | 252 |
|           | Summary  | 255 |

**PART IV**  
**Common Coding Patterns**

|           |   |     |
|-----------|---|-----|
| <b>18</b> | Common Business Service Coding Examples                   | 259 |
|           | Coding in the Entity Object                               | 260 |
|           | Setting an Attribute Value Depending on Another Attribute | 260 |
|           | Getting an Attribute Value from a Different Entity Object | 261 |
|           | Overriding the Deletion of an Order                       | 262 |
|           | Coding in the View Object                                 | 265 |
|           | Dynamically Setting a View Criteria                       | 265 |
|           | Changing Values Across a View Object                      | 266 |
|           | Summary   | 268 |
| <b>19</b> | Common UI Coding Examples                                 | 269 |
|           | How to Programmatically Access Page Bindings              | 270 |
|           | How to Programmatically Access an Attribute Value         | 271 |
|           | How to Programmatically Execute a Method                  | 271 |
|           | How to Programmatically Access the UI Context             | 272 |
|           | Programmatic Display of Messages                          | 272 |
|           | Programmatic Partial Page Refresh                         | 274 |
|           | Summary   | 275 |
|           | Index   | 277 |