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Oracle E-Business Suite Development and Extensibility Handbook

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Introduction

The idea for writing a book about Oracle E-Business Suite development, customization, and extensibility techniques stemmed from everyday practical experiences as well as the seminars, presentations, and courses taught by the authors on this subject. Although the Internet seems awash with information related to Oracle Applications, most of it is still largely unstructured when it comes to the practical aspects of custom development and Oracle tool use for the purposes of customization in Oracle E-Business Suite.

Writing a book on this subject was a challenging task, mainly due to the myriad of tools and products used within Oracle E-Business Suite, including JDeveloper, Oracle Forms, Oracle Reports, Oracle Database, SQL Plus, Oracle Application Server, Oracle Workflow, BI Publisher, XML Gateway, BPEL Process Manager, and others. Oracle Applications also use a wide variety of programming languages and standards such as SQL, PL/SQL, Java, C, XML, Web Service Description Language (WSDL), shell scripts, Service Oriented Architecture (SOA), and many others.

The motivation to write this book came from our fruitless struggles to suggest to our colleagues a single resource on how to use the tools in the context of E-Business Suite extensions. This book is an attempt to fill that gap, and its main aim is to provide a head start to anyone who is beginning to learn Oracle E-Business Suite R11i/R12 development and extensibility techniques, as well as more seasoned E-Business Suite developers who haven't had a chance to work with the tools and the development methodologies covered in this book.

This book is a guide that describes the fundamentals in a compact form and provides step-by-step examples of the key technologies in Oracle E-Business Suite that will benefit not only beginners, but also a seasoned professional. It focuses on covering the essentials for the purposes of satisfying these immediate needs.

We strongly recommend that you always consult related manuals and user and development guides that accompany E-Business Suite products and are available at the Oracle Technology Network website and Metalink. This book is not a substitute for the user and development guides that come with the E-Business Suite product, and some of the topics in this book deserve a book in their own right.

Who Should Read This Book

This book is for developers and professionals who are either already working or intend to work on extending, customizing, and personalizing E-Business Suite releases 11i and R12. When writing the book, we had three types of readers in mind: university graduates who recently joined a consulting organization without prior exposure to E-Business Suite, Oracle professionals with extensive Oracle tools knowledge but without previous exposure to E-Business Suite, and experienced Oracle E-Business Suite professionals who didn't have exposure to some of the techniques covered in this book.

We assume that you are familiar with at least the basics of the programming languages and tools such as SQL, PL/SQL, Java, XML, and others used within the suite. This book is not going to teach you how to program in those languages or tools. Instead, we provide guidance on how to use them in the context of E-Business Suite custom development and extensions.

About the Examples

The step-by-step examples in this book are quite simple and largely self-explanatory. Their purpose is to get you started quickly with a particular tool, methodology, programming language, or development framework in E-Business Suite. Please bear in mind that in order to keep things simple and short, in many instances we didn't follow the usual coding standards such as code commenting, variable anchoring to database data types in PL/SQL, and the like; therefore, do not assume that the examples are production-grade code.

We have tested the examples against the R12.0.4 version of E-Business Suite VISION installation on Linux, but all of the examples should also work against the VISION installation of release 11i (11.5.7+) with the latest Applications Technology patches applied. This implies that in order to follow the examples in this book, you'll need an access to the demonstration (VISION) installation of E-Business Suite, although most of the examples can be tried on any development instance of E-Business Suite.

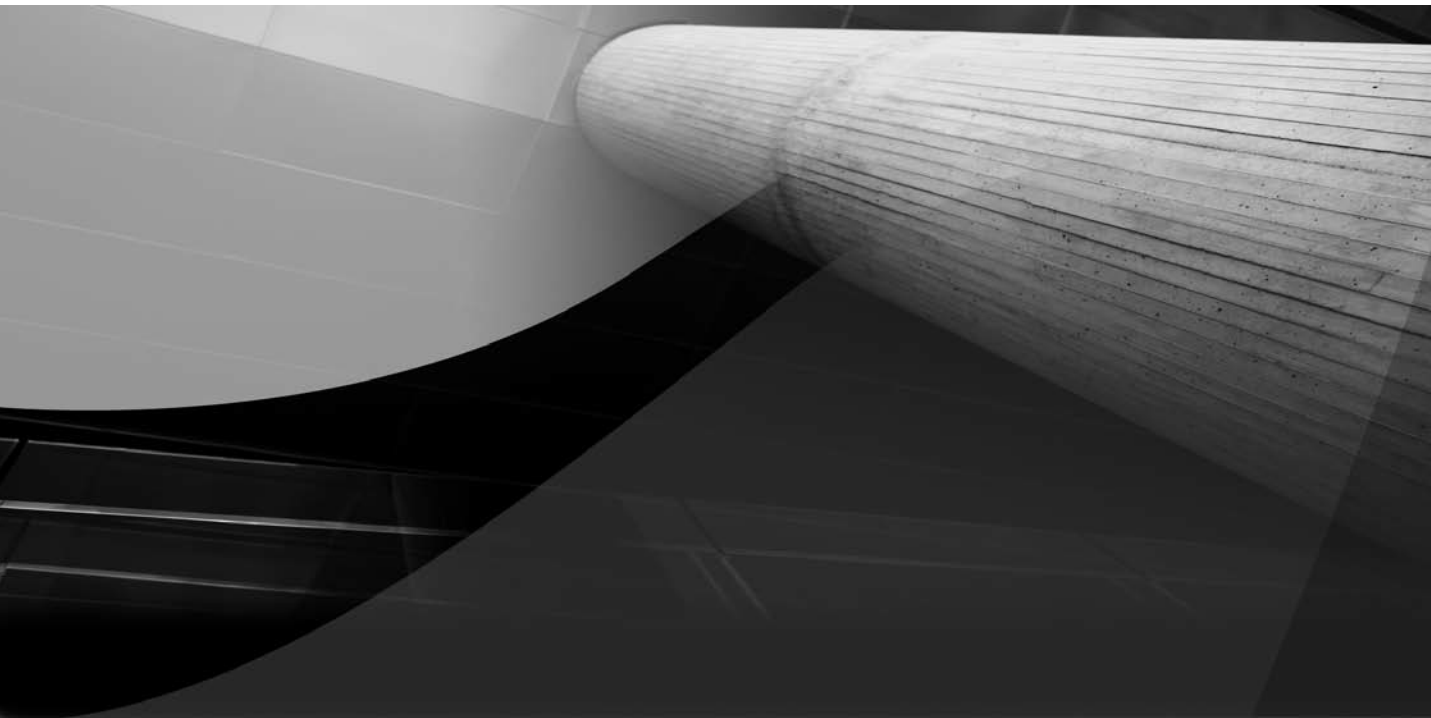
Additionally, we assume that examples are deployed against a custom application that, in this book, we called "Custom Development" with the short name *XXCUST*. How to create the custom application is covered in the System Administrator's Guide for each release of Oracle Applications. For example, for release R12.1 this is documented in Oracle Applications System Administrator's Guide—Configuration Release 12.1, which can be downloaded from Oracle Technology Network (OTN) or Metalink (Oracle Support online resource).

The Structure of the Book

At the beginning of each chapter we provide a summary of how a particular technology or development framework works and then we move on to the examples; at the end of the chapter we provide good practices as applicable. The first four chapters (Chapter 1, “Introduction to Oracle E-Business Suite”; Chapter 2, “E-Business Suite Architecture”; Chapter 3, “Application Object Library [AOL]”; and Chapter 4, “Multiple Organizations Feature”) are exceptions to this rule, as they are intended to introduce some of the key concepts in E-Business Suite to those readers who are new to it.

The chapters are largely independent from one another, although we recommend that readers without prior exposure to E-Business Suite not skip the first four chapters.

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CHAPTER 1

Introduction to Oracle E-Business Suite



In this introductory chapter, we'll give a high level functional overview of Oracle E-Business Suite from an application developer's point of view. This chapter is primarily aimed at the readers who are familiar with Oracle tools but new to E-Business Suite; those who have already gained experience in working with E-Business Suite can safely skip this chapter.

We also look at what options are available to implementation teams and developers to change the standard product features, and later in the chapter we briefly discuss the concept of E-Business Suite environments.

At the end of this chapter we look at how information is shared and reused within different modules in Oracle Applications in order to highlight the importance of data sharing between different modules within E-Business Suite.

What Is Oracle E-Business Suite?

Oracle E-Business Suite is a software package that allows organizations to manage key business processes; it is known on the market by various names such as Oracle Enterprise Resource Planning (ERP), Oracle Apps, Oracle Applications, Oracle Financials, e-Biz and EBS (E-Business Suite). In this book we refer to it as either E-Business Suite, or Oracle Applications.

In the past, it was a common practice for businesses and organizations to develop in-house software to automate their business processes. Most of the software that was developed in-house largely matched the precise needs of the business. However, the fundamental business flows and processes such as accounting, procurement, human resource/employee management, and order management are based on common principles across all organizations. For example, most organizations require a system to make purchases from suppliers and a system to make payments to the suppliers, events known as transactions that need to be accounted for in the financial reporting. Enterprise Resource Planning (ERP) software prepackages different types of these functionalities into out-of-the-box software package, so that customers who purchase such software packages do not have to develop the same software applications time and again.

Product Families

Oracle E-Business Suite is a product offering that covers almost all of the business flows widely used in most organizations. Businesses can implement as many modules as necessary due to the modular but still integrated nature of the E-Business Suite architecture. This allows unified information to be available across the enterprise; it also reduces information technology (IT) expenses and helps run business more efficiently.

On the contrary, managing heterogeneous software solutions developed in-house that use different systems and technologies can be extremely costly and complex. Any time you update one system, you must go back and review all the integration points and potentially update the interfaces between the systems. Oracle E-Business Suite is engineered to work as an integrated system on a common IT infrastructure. You can directly pass information from one application to another without incurring incremental integration costs.

The product offering in E-Business Suite is organized into product families. Some of the key product families are as follows:

- Financials
- Procurement
- Customer Relationship Management (CRM)
- Project Management
- Supply Chain Planning and Management
- Discrete Manufacturing
- Process Manufacturing
- Order Management
- Human Resources Management System (HRMS)
- Applications Technology

In E-Business Suite, each product family usually consists of individual applications. For example, some of the applications that make up the Oracle Financials product family are General Ledger, Payables, Receivables, Cash Management, iReceivables, iExpenses, and others. It is beyond the scope of this book to cover the functionality of products such as General Ledger, Oracle Purchasing, and the like. There is a wealth of information about the functionality of E-Business Suite products publicly available, and we suggest the following resources for further reading:

- **Oracle Technology Network (Documentation section)** www.oracle.com/technology/documentation/applications.html
- **Oracle E-Business Suite** www.oracle.com/applications/e-business-suite.html
- **Oracle Metalink (requires registration)** metalink.oracle.com



NOTE

Throughout this book, we'll sometimes refer to E-Business Suite applications as modules. The terms application and module will be used interchangeably.

Professional User Interface

When the Oracle ERP product was initially launched, the screens were built in character mode. The end users interacted with the system through dumb terminals, which provided a character-based interface that connected to the back end server. Both Oracle Forms (then known as SQL*Forms) and Oracle Database were run at the back end tier. Initially, the R10.7 version of Oracle Applications ran in character mode, as did all the previous releases. However, when Oracle released its GUI version called SmartClient, the SmartClient screens were built with Oracle Forms 4.5 and ran at the desktop client tier, accessing the database over the network. Although SmartClient provided a better user experience, it was difficult to maintain, as software updates needed to be distributed on every individual client desktop. Last in that release, Oracle announced R10.7 NCA (Network Computing Architecture), which was an attempt to integrate the latest web technologies into Oracle's business applications using three-tier architecture, including database and application servers; end users interacted with the system using the browser from their client desktops. The latest releases of E-Business Suite, R11i and R12, are also based on multi-tier architecture, and the details will be covered in the next chapter.

Nowadays, in the latest releases of E-Business Suite R11i and R12, we refer to the professional user interface as an interface that is built with the Oracle Forms developer tool. Such Forms-based screens run within a Java applet at the client desktops, and in their appearance and behavior they are similar to desktop applications. Office personnel who often performs data entry tasks usually prefer using this type of user interface as it allows speedy data entry.

Web User Interface

As mentioned in the previous section, most of the screens in Oracle E-Business Suite were initially developed using Oracle Forms. However, over the last few years, Oracle has started to deliver new screens using pure web-based technology. These web-based screens do not run within a Java applet, unlike Forms-based screens. Instead, the HTML-based screens are run with a browser such as Firefox or Internet Explorer. Oracle initially started developing HTML-based pages in E-Business Suite primarily to provide a light footprint application or Self-Service-based applications. Here are some examples of the Self-Service applications:

- **HR Self-Service** End users maintain their own personal records, such as name, address, and so on.
- **iProcurement** Users create requisitions to buy goods such as stationery by themselves directly rather than having a central purchasing team creating that order for them.
- **iRecruitment** Users apply for a different job internally within their organization.
- **iExpenses** Employees submit their expenses for approval via a web interface.

The reasons that justify the broad adoption of an HTML-based interface is ever increasing; here we list just a few of them:

- Commitment to the open industry standards usually leads to the increased product interoperability.
- A pure HTML-based web application is lightweight and it runs without the need for a Java applet in the browser.
- An adoption of the new components and emerging technologies such as AJAX, Rich Internet Applications (RIA), and others ensures a better end user experience.

As a result of the preceding factors, even the new back office screens are now being developed as HTML-based pages using Oracle Application Framework (OA Framework). The sophisticated user interface features that were previously offered only through Oracle Forms are increasingly becoming available to HTML-based screens that run exclusively within desktop browsers, without the need for Java applets.

Nowadays, Oracle E-Business Suite developers find themselves working with both Oracle Forms and OA Framework, as the current releases (Release 11i and Release 12) contain a mixture of screens using both the technologies. Later in the book, we cover both Oracle Forms in Chapter 6 and E-Business Suite Oracle Applications Framework development techniques in Chapter 9.

Configurations, Personalizations, Extensions, and Customizations

Oracle E-Business Suite was designed and developed to take into consideration various standard business flows that are common to most organizations. However, each business can have its own unique requirements. For example, a company may want to allow all of its employees to make purchases up to \$10 without