Oracle9*i* Designer: Technical Overview

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EXECUTIVE OVERVIEW

Only **one** product, Oracle9*i* Designer, offers a toolset to **model**, **generate** and **capture** the requirements and design of your web-based applications quickly, accurately and efficiently, and also to assess the impact of changing those designs or applications. Oracle9*i* Designer is part of Oracle's Internet Developer Suite of development tools.

Oracle9*i* Designer offers all the features required for the complete 'end-to-end' development of these applications. The flexible and integrated environment of Oracle9*i* Designer enables you to:

- Design databases and applications to implement and underpin e-business solutions
- Protect your current investment by capturing, then redesigning legacy applications
- Completely generate sophisticated web-enabled applications

Supporting these extensive features is Oracle9*i* SCM (Software Configuration Manager), which is used to store and manage the meta data for your applications. Oracle9*i* SCM enables you to manage multiple versions and configurations of software development objects to facilitate team working and project management.

The benefits of Oracle9*i* Designer match your preferred development approach. Oracle9*i* Designer does not enforce any methodology, but includes support for End-User Driven (Rapid Application Development), Information Driven (Information Engineering), Process Model and Design Capture driven development.

Oracle9*i* Designer is also the basis of the Oracle development methodology and toolkit, Oracle Custom Development Method (CDM) used by Oracle Consulting organizations around the world. CDM is a full life cycle methodology for delivering custom solutions.

Therefore, Oracle9*i* Designer is the product to use to rapidly develop applications for web-based environments. This white paper summarizes its features and benefits and outlines the purpose and functionality of each tool.

THE BENEFITS OF USING ORACLE9*i* DESIGNER

Single Point of Truth for Application Meta Data

To enable you to respond to changes in technology rapidly, Oracle9*i* Designer offers the ability to single source application meta data from one central repository (the engine behind Oracle9*i* SCM), for example a table definition. This stimulates productive and efficient model based application development for deploying in a web-based environment.

Accurate Analysis of System Requirements

Oracle9*i* Designer provides integrated graphical modeling tools to represent the requirements of new or legacy applications accurately, quickly, and easily. The tools integrate tightly with the Oracle9*i* SCM toolset to enable team-based working in a multi-user environment in which requirements are available immediately.

All Oracle9*i* Designer systems modeling tools support standard modeling techniques for analyzing relational database system requirements. Use them to rapidly record and verify the relevant, important features of your business, to deliver the required application first time.

Powerful Default Database and Application Design Transformers

Oracle9*i* Designer provides powerful transformers for quickly and seamlessly creating default database and application designs from your validated system requirements. The Database Design Transformer builds a database schema, with tables, columns, indexes and referential integrity constraints, while the Application Design Transformer builds complete module definitions for screens, reports and menus.

These first cut database and application designs are immediately ready for review and further design, until you generate the finished application. Transformers establish comprehensive baselines for your designs. Using them promotes focusing on analyzing initial system requirements more efficiently, which increases productivity and improves the quality of the finished application.

Rapid Creation of Databases and Applications Using Generators

Oracle9*i* Designer generators create high quality, usable applications using meta data in the Oracle9*i* SCM repository. These generators provide facilities for specifying and generating all the crucial elements for a web-based application, for example:

- Oracle9*i* Database objects
- Oracle9*i* Forms
- PL/SQL Application Programmatic Interfaces (APIs)
- Web PL/SQL

The Oracle9*i* Designer generators are a productive, accurate and trouble free method for generating and implementing the right application for the right platform. They help you to reap the benefits of investing in the earlier analysis and design stages of the development life cycle.

Effective Design Capture of Existing Applications

Robust design capture features in Oracle9*i* Designer will capture all the design information for a legacy application easily and efficiently. Applications developed using Oracle9*i* Forms or that use a non-Oracle database may also be captured, including the application logic written in the native scripting environment. Using Oracle9*i* Designer to design capture your applications offers several advantages, regardless of its source. Migrating an Oracle or non-Oracle database from a legacy application is not an issue, because Oracle9*i* Designer will capture the design of any ODBC compliant database. It provides an enterprise view of all of your existing business data, recording legacy meta data for amending and regenerating later or as a baseline for new requirements.

Complete, Iterative Design and Development

Oracle9*i* Designer supports the process of changing an application after generating it, capturing the changes into Oracle9*i* Designer, then regenerating the application while preserving the changes. This reflects how Oracle9*i* Designer is integrated tightly with the latest Oracle9*i* Forms and Oracle9*i* Reports functionality. This iterative design is a key element of a complete, productive environment required for designing and developing new applications from scratch or based on legacy applications.

Comprehensive Repository Management Facilities

To facilitate the rapid, productive and efficient design and generation of applications, Oracle9*i* Designer uses Oracle9*i* SCM; a comprehensive set of tools for storing and managing application meta data.

Versioning and Configuration Management

Oracle9*i* SCM supports each stage of the development process in a true multi-user environment, which facilitates smooth team working on small or large-scale applications in a secure, controlled environment. Parallel development of applications from a single source is assured because Oracle9*i* SCM can be used to:

- Create configurations of all the application meta data for a particular version or release
- Manage multiple versions of software development objects
- Compare, and if necessary merge, versions of software development objects

Defining, changing, and updating applications using Oracle9*i* Designer is trouble free, knowing that Oracle9*i* SCM will synchronize the application and its meta data instantly. Users' access to the repository is strictly controlled, and users 'check in' and 'check out' software development objects under version control, providing an essential method for recording and reporting on the status and history of changes to these objects.

Powerful Dependency Analysis

You have the power to analyze dependencies between structured and unstructured data. There is an opportunity to check for shared components and gauge the complexity of an application, reducing the risk of duplicating effort and promoting the use of reusable, single source components.

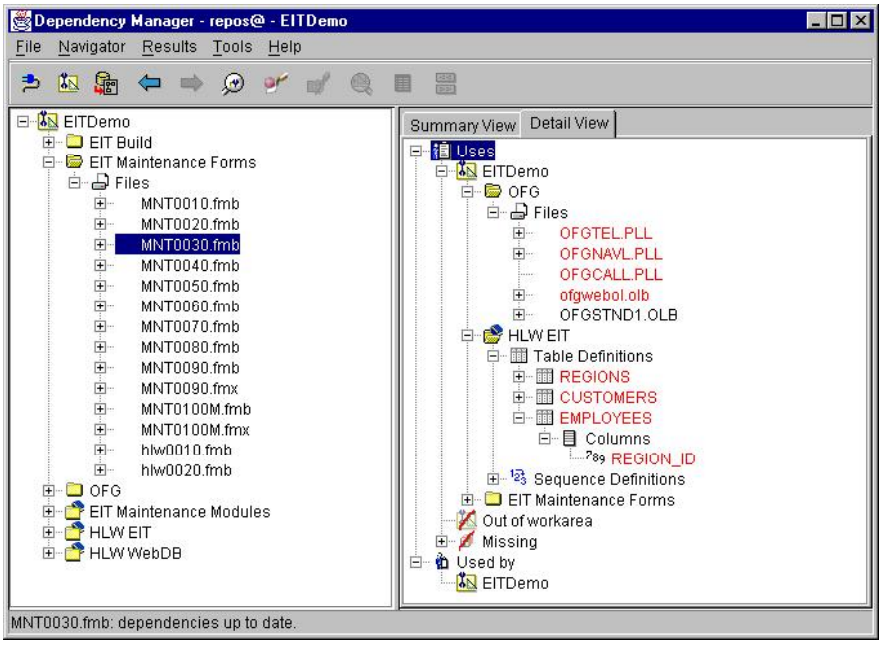

Figure 1: Dependencies Viewed in the Dependency Manager

Oracle9*i* SCM contains an open and published API and supports creating custom software development objects to help meet any activities or meta data needs specific to your business.

OVERVIEW OF ORACLE9*i* DESIGNER TOOLS

You access the entire Oracle9*i* Designer modeling, design, generation and Oracle9*i* SCM tools using the 'one stop' point of entry, the Oracle9*i* Designer Front Panel. This section outlines the purpose and functionality of each Oracle9*i* Designer tool, based on the development activity to which it relates.

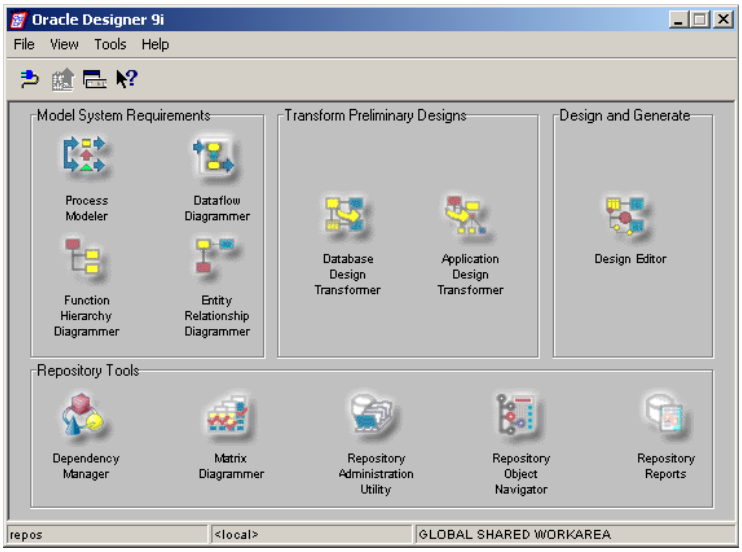

Figure 2: The Oracle9*i* Designer Front Panel

Modeling System Requirements

The **Process Modeler** represents current and future target business processes, including metrics such as time, cost and yield. It also provides flexible support for Business Process Reengineering techniques.

The **Entity Relationship Diagrammer** represents the data-centric system requirements of a business and provides access to the Database Design Transformer for creating default database designs. It uses standard information engineering notation to represent things of importance (entities), their properties (attributes) and how entities relate to each other (relationships).

The **Function Hierarchy Diagrammer** represents the elementary business functions that your business performs, which illustrate how you use entities and their attributes, key to creating application designs. It supports Function Point Analysis for project management purposes and also provides access to the Application Design Transformer for creating default application designs.

The **Dataflow Diagrammer** represents how data flows through your business at any level to identify if data dependencies exist, for example between datastores and elementary business functions. It offers rapid treewalking across the functional model and provides access to the Application Design Transformer for creating default application designs.

Transforming Preliminary Designs

The **Database Design Transformer** creates first cut database designs (or server models) based on the Entity Relationship Diagrams created when defining system requirements. It creates for example, tables to record instances of entities, columns to store attributes, and indexes to support foreign keys.

You have the power to control the scope of the design process completely, offering the choice of developing detailed whole models or concentrating on single steps.

The **Application Design Transformer** creates first cut application designs based on the functions and business unit definitions created when defining system requirements. It creates candidate modules and menus, modules you then implement easily as Oracle9*i* Forms, Oracle9*i* Reports or Web PL/SQL using the Design Editor.

You have the choice of using candidate modules and menus in the generated application for the appropriate context and platform, or leaving them as part of the design for possible future use. This flexible approach supports considering design implications thoroughly and dealing with any possible need to respond easily to requirement changes.

Designing and Generating Databases and Applications

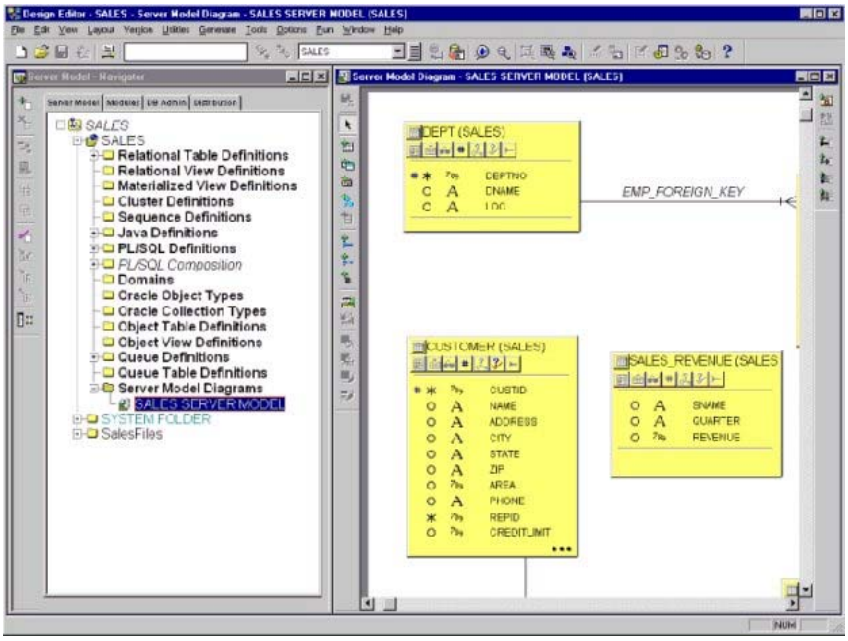

Figure 3: The Oracle9*i* Designer Design Editor

The **Design Editor** is the control center for database and application design, generation, and design capture. Features such as multiple diagram types, preference palettes, object libraries and wizards form a workbench for new or experienced

users to define user interface standards once, and then enforce them across an application.

The Design Editor's declarative approach represents business rules graphically, fully supporting the design and generation of relational and object relational database structures:

- Generate applications for any target platform from meta data stored in the repository
- Generate Oracle9*i* Forms, Oracle9*i* Reports and/or Web PL/SQL from the same, single diagram
- Define and generate application logic for PL/SQL or JavaScript
- Generate and design capture Oracle and non-Oracle databases
- Design capture applications for analysis, redesign, and regeneration

Oracle9*i* Forms Generator and Oracle9*i* Reports Generator

Used through the Design Editor, the Oracle9*i* **Forms Generator** and Oracle9*i* **Reports Generator** fully specify, generate, or capture the design of Oracle9*i* Forms and Oracle9*i* Reports. This facilitates the rapid creation of applications for deploying in a web-based environment. Oracle9*i* Forms Generator has the functionality to fully integrate with the powerful functionality available in Oracle9*i* Forms. This functionality includes:

- The ability to capture forms into Oracle9*i* Designer directly from Oracle9*i* Forms (including any changes made to generated forms in Form Builder, for example changes to generated application logic)
- Separating Lists of Values (LOVs) from lookup table usages to make them easier and quicker to generate. Users can also define LOVs for unbound items, define multiple LOVs for the same block and reuse the same LOV across multiple blocks and multiple forms
- Support for splitting blocks across multiple canvases by generating multi-region blocks and also for side-by-side blocks on the same canvas
- Relative tab stops (not absolute tab stops from previous releases) for positioning and aligning items and item groups, which the Design Editor represents graphically
- The ability to capture the design of multi-region blocks, specify real units when setting decoration preferences and generate Bean Area items to contain JavaBeans

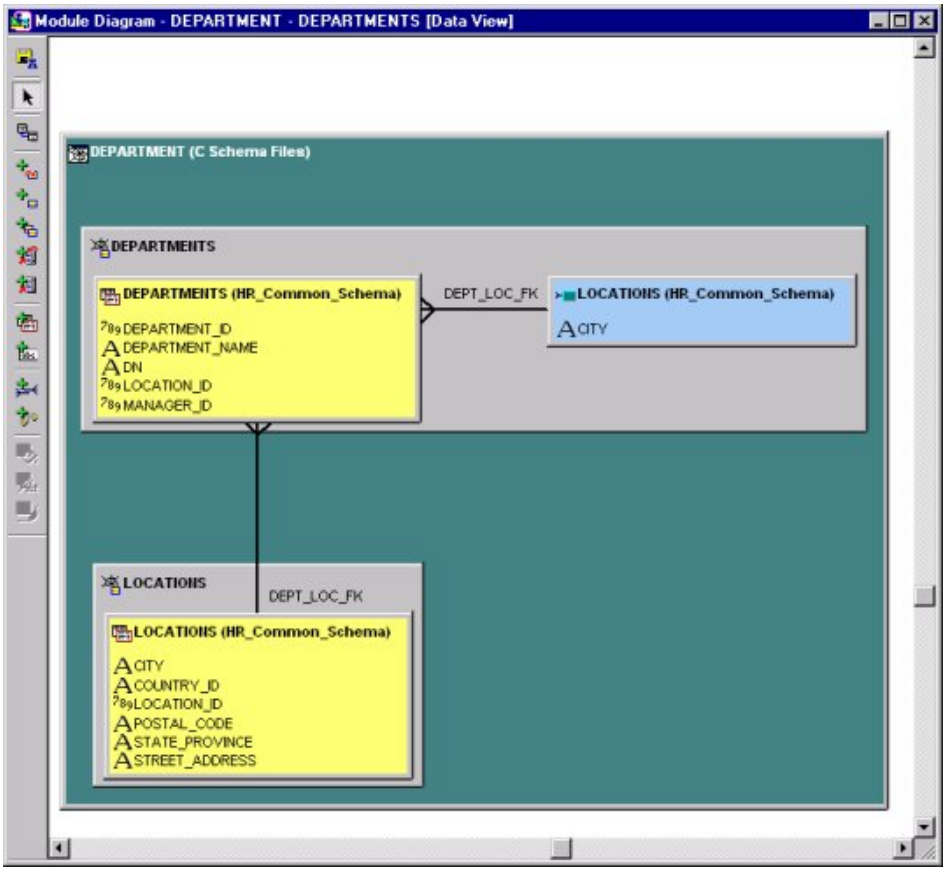

Figure 4: Generating Oracle9*i* Forms from Oracle9*i* Designer Module Definitions

Oracle Web PL/SQL Generator

Used through the Design Editor, the **Web PL/SQL Generator** generates applications for deploying in a web-based environment using Oracle9*i* Application Server (9iAS). The generated applications run in an industry-standard browser and consist of PL/SQL packages, which generate a dynamic HTML user interface with JavaScript validation code.

The Web PL/SQL Generator uses the same module definitions as those used to generate Oracle9*i* Forms. It provides a robust method for publishing information stored in the repository, and the support for JavaScript adds data manipulation capabilities to the HTML platform.

Full support for cascading style sheets, multiple frames on a page, and graphics results in generating attractive and powerful HTML based applications.

Oracle Server Generator

Used through the Design Editor, the Server Generator creates your application database objects, database administration objects, and PL/SQL Server API. You

can choose whether to generate these objects directly into the target database, or generate to script files. The ability to capture all this information from existing databases allows you to maintain and redesign your applications using Oracle9*i* Designer.

The Server Generator exploits all the sophisticated features and capabilities of Oracle9*i* relational database technology, for example distributed databases, server-side validation and logic, role-based security models, data replication, and so on. It offers full support for generating the different flavors of Oracle relational databases:

- Oracle9*i*
- Oracle8*i*
- Oracle8 RDBMS VLDB and Object extensions
- Oracle7
- Oracle RDB

Additionally, the Server Generator offers extensive generation and design capture capabilities for any ODBC compliant non-Oracle database, for example DB2, Microsoft SQL Server, Sybase, or ANSI standard SQL DDL.

Generating the PL/SQL Server table API (TAPI) for all the table definitions created in the database provides server-side validation of the constraints that enforce the relationships between database objects, for example denormalization. This facilitates multi-tier applications that encapsulate database data within the database logic.

STORING AND MANAGING APPLICATION META DATA

The **Repository Administration Utility** (RAU) is the nerve center of Oracle9*i* SCM, used to administer the SCM repository from day to day. This graphical tool is the mechanism for installing a new repository for Oracle9*i* Designer, or migrating or upgrading a repository from a previous release. It's here that you add customized software development objects to meet meta data needs specific to your business.

Using the RAU to perform administrative tasks, for example checking repository objects and system requirements, backing up repository objects and maintaining user access, underpins the true multi-user environment of Oracle9*i* SCM.

Repository Object Navigator

The **Repository Object Navigator** (RON) is the tool that exposes the infrastructure for storing and managing all your software development objects and related files stored in the SCM repository. Use it with the RAU to complete tasks relating to repository administration, and to access objects in it, but specifically for maintaining multiple versions of those repository objects.

Creating and managing your software configurations is easy and efficient using the Repository Object Navigator and Property Palette to see details of the objects in each configuration.

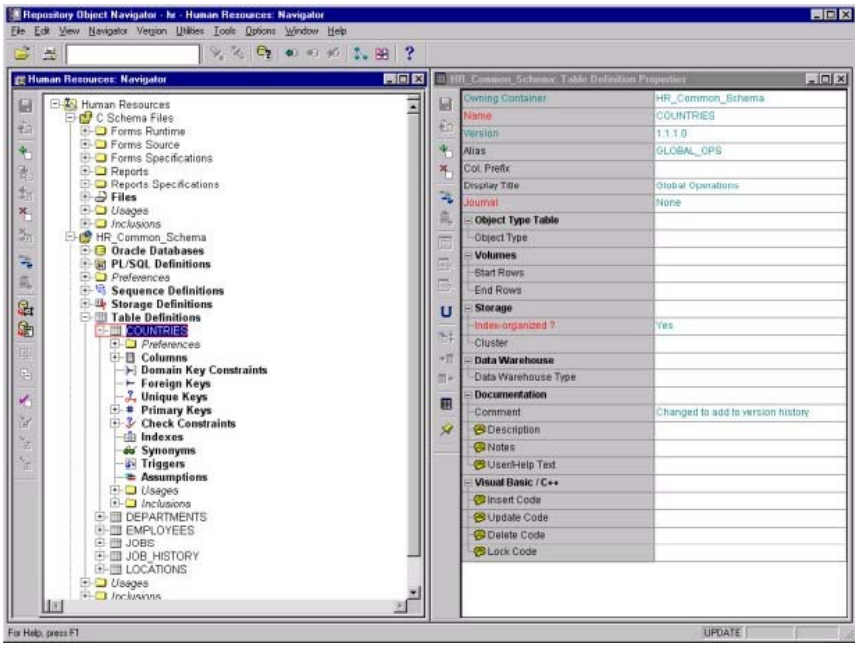

Figure 5: The Oracle9*i* Designer Repository Object Navigator

Managing Multiple Versions or Objects

Version History Viewer and Dependency Manager

The **Version History Viewer** is a graphical tool used to display a history of the different versions of an object stored in the SCM repository. You can view the number of versions and branches that exist for an object, including the relationship between versions, which versions are checked out and the latest version of each object on each branch.

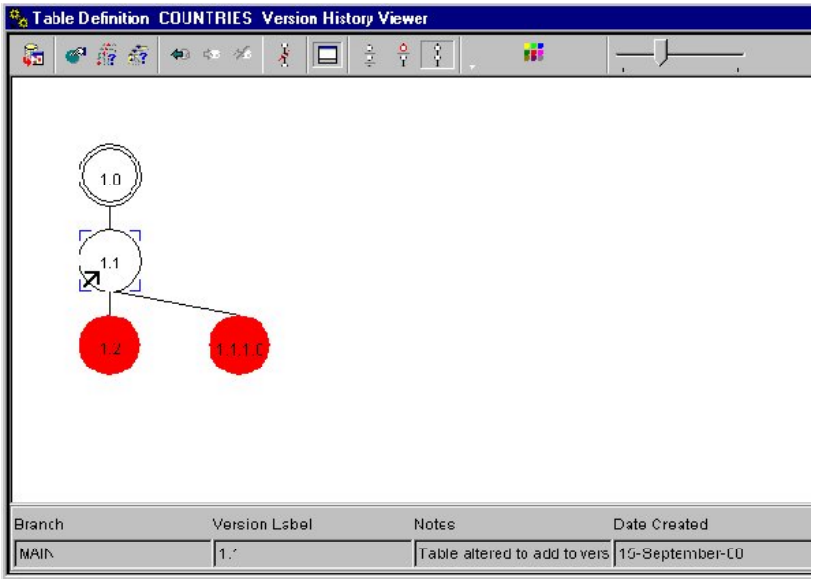

Figure 6: The Version History of a Repository Object

Version Event Viewer

To complete a comprehensive and easy-to-use graphical view of the multiple versions of your repository objects, the Version History Viewer is coupled with the **Version Event Viewer.** This is another graphical tool used to list, in chronological order, details of the different versions of an object stored in the repository. Details displayed include, for example, the number of versions created since a particular time and date and which user makes the most changes to an object.

Dependency Analysis

To analyze associations between structured and unstructured data stored in the SCM repository, enabling effective impact analysis of changing objects and management of configurations, the RON also provides access to the **Dependency Manager**.

The Dependency Manager

Using the Dependency Manager ensures no dependencies remain unknown. Over time, a wealth of dependency information builds up for your application, all stored in the SCM repository for immediate access and analysis. The result is more

efficient development activities, with common components identified to reduce duplicating effort.

The Matrix Diagrammer

The **Matrix Diagrammer** is a general-purpose cross-referencing tool that supports assessing the scope of a project, impact analysis, network planning and quality control. The cross-referencing of information in the repository is important throughout the development lifecycle. The Matrix Diagrammer could answer questions such as:

- To what strategic objective or critical success factor does this program contribute?
- Do I have any functions that do not use entities in any way?
- At which network nodes are my database tables currently residing?

The Matrix Diagrammer cross-references two or three types of objects and provides the ability not just to view the objects, but also to create and update them.

Repository Reports

Repository Reports provides approximately 100 predefined reports for examining the contents of the SCM repository. The graphical **Reports Navigator** displays the reports by name, or divided into groups, depending on their usage or the type of information they show. Therefore, selecting the right report to run is easy.

Repository reports offer in-depth information for monitoring progress and identifying the associations between elements of the application developed using different Oracle9*i* Designer tools. Custom-built reports are available to offer a complete reference of your application covering any business specific meta data needs not included in the predefined reports.

SUMMARY

Only Oracle9*i* Designer offers the comprehensive toolset that enables you to 'fast track' your development activities for web-based e-business applications. It supports the latest release of the Oracle database, Oracle9*i*, and integrates fully with other development tools such as Oracle9*i* Forms. Coupled with Oracle9*i* SCM, Oracle9*i* Designer delivers a productive environment for developing small or larger scale, complex applications.

Oracle9*i* Designer offers a powerful, flexible, efficient, accurate and automatic approach that is easy to manage and maintain. Use it to reduce the amount of coding necessary, focus on analysis and design and therefore improve the quality of the finished application by hitting the target first time.

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