Chapter I

Object-Relational Approaches

This book focuses on the implementation of an object-oriented model into object-relational DBMS using Oracle™. All aspects of the object-oriented model, particularly those that play a significant role in database implementation, will be discussed in this book.

The object-oriented modeling technique is an important issue in this book because it is the underlying notion behind the development of the object-relational approaches. Therefore, in this chapter we will start with an outline of the object-oriented conceptual model (OOCM).

Object-Oriented Conceptual Model

An OOCM encapsulates the structural and static as well as behavioral and dynamic aspects of objects. The static aspects consist of the classes and objects, and the relationships between them, namely, inheritance, association, and aggregation. Each of these relationships is associated with a set of constraints. The dynamic aspect of the OOCM is divided into two types of methods: generic and user defined.

The object-oriented method promised to improve software quality and efficiency. One of the most enticing promises is that of real reusability: reusability...
of codes, program portions, designs, formal specifications, and also commercial packages. As software-development cost increases, more developers see the benefit of using reusable components. Solving the reusability problem essentially means reducing the effort required to write codes; hence, more effort can be devoted to improving other factors such as correctness and robustness.

The main idea of the object-oriented method is that it provides a more natural way to model many real-world situations. The model obtained by the object-oriented method will be a more direct representation of the situations, providing a better framework for understanding and manipulating the complex relationships that may exist.

The basic segment of the object-oriented system is an object. Everything that exists and is distinguishable is an object. Each object has one or more unique attributes that make it distinguishable from the others.

However, several objects can also have the same structure of attributes and operations. Only after the attributes’ values are given can an object be recognized. A set of attribute structures and operations applicable to those attributes is called a class.

In the object-oriented method, we also recognize the concept of encapsulation. Basically, from an outside point of view, each object is just a thing or a person (such as a student named Jennie, Andy, etc.). However, if each object is explored in greater detail, it actually consists of some attributes (identity, name, status, gender, etc.) for which each object has its own value and so is distinguishable, as are the operations that are applicable to those sets of data (print details, set details, etc.). In other words, an object is simply an encapsulation of data and their operations.

Static Aspects of OOCM

The static aspects of OOCM involve the creation of the objects and classes that also includes decisions regarding their attributes. In addition, the static aspects of OOCM are also concerned with the relationship between objects, that is, inheritance, association, and aggregation.