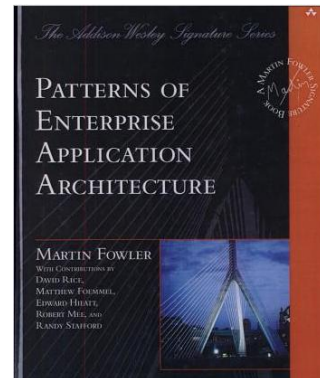


Patterns of Enterprise Application Architecture



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1

Enterprise Applications

- Complex data
- Lots of data
- Persistence
- UI
- Concurrency / Distributed Computing

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2

Value Object

A small simple object, like money or a date range, whose equality isn't based on identity.

- similar to the primitive types

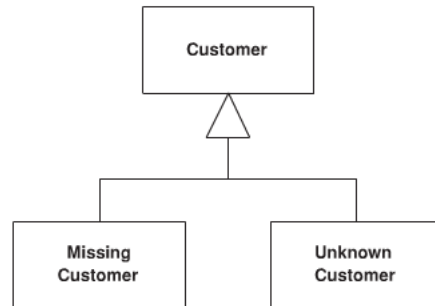
Money

Represents a monetary value.

Money
amount currency
+, -, * allocate >, >, <=, >=, =

Special Case

A subclass that provides special behavior for particular cases.

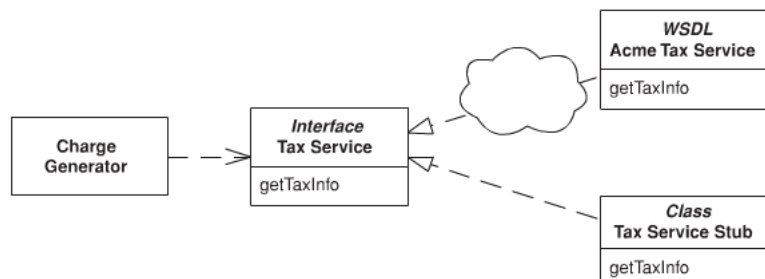


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5

Service Stub

Removes dependence upon problematic services during testing.

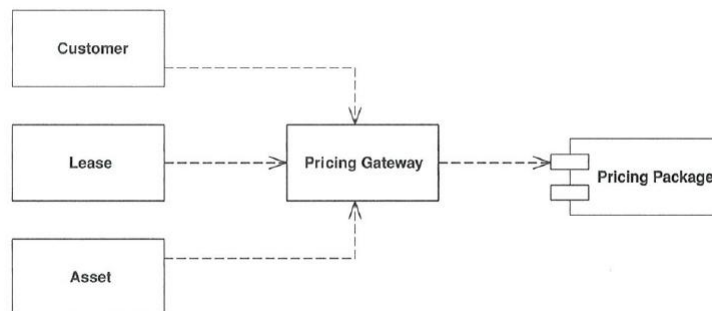


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Gateway

An object that encapsulates access to an external system or resource.

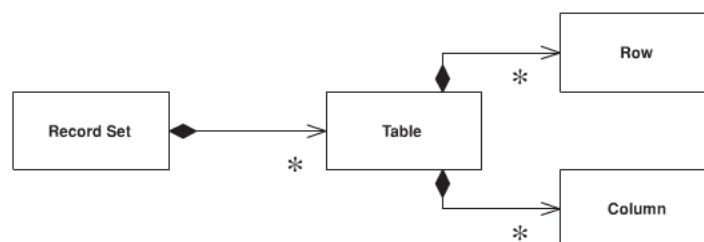


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7

Record Set

An in-memory representation of tabular data.



- A Record Set is usually something that you won't build yourself, provided by the vendor of the software platform you're working with.

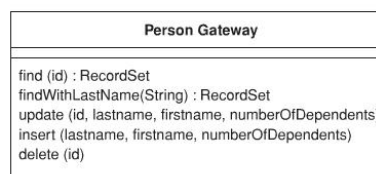
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Table Data Gateway

Table Data Gateway

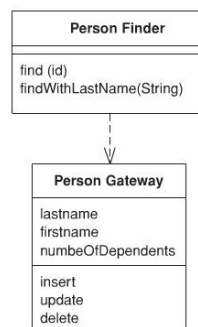
*An object that acts as a Gateway (466) to a database table.
One instance handles all the rows in the table.*



Row Data Gateway

Row Data Gateway

*An object that acts as a Gateway (466) to a single record in a data
source. There is one instance per row.*



Row Data Gateway

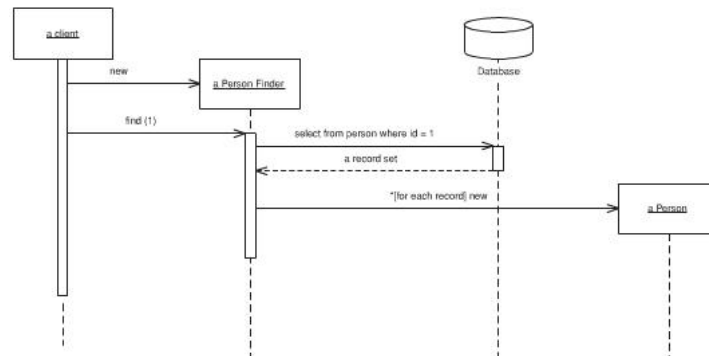
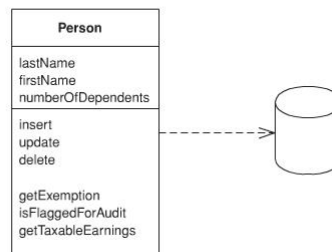


Figure 10.2 Interactions for a find with a row-based Row Data Gateway.

Active Record

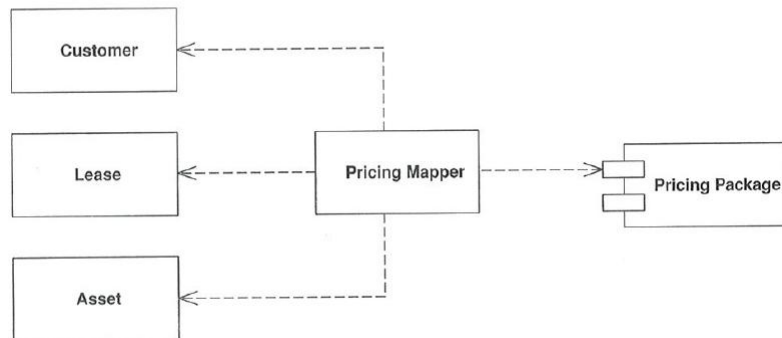
Active Record

An object that wraps a row in a database table or view, encapsulates the database access, and adds domain logic on that data.



Mapper

An object that sets up a communication between two independent objects.



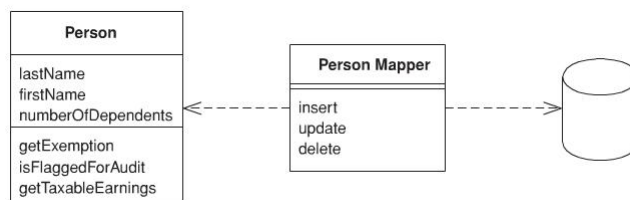
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Data Mapper

Data Mapper

A layer of Mappers (473) that moves data between objects and a database while keeping them independent of each other and the mapper itself.



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Data Mapper

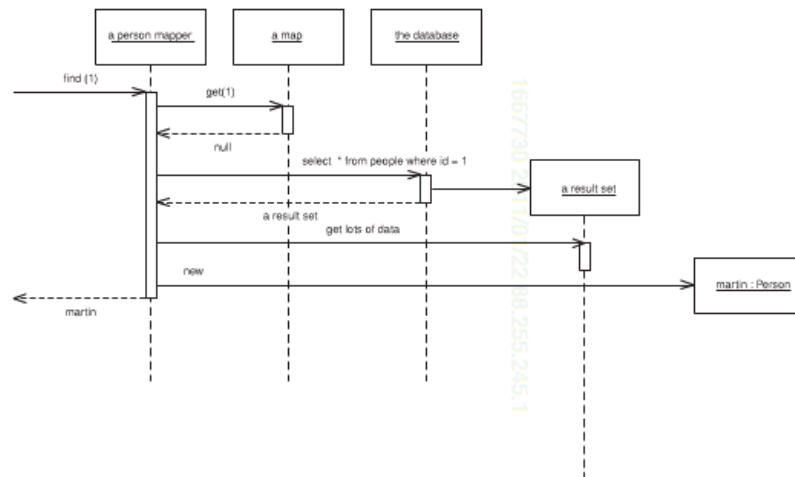


Figure 10.3 Retrieving data from a database.

Data Mapper

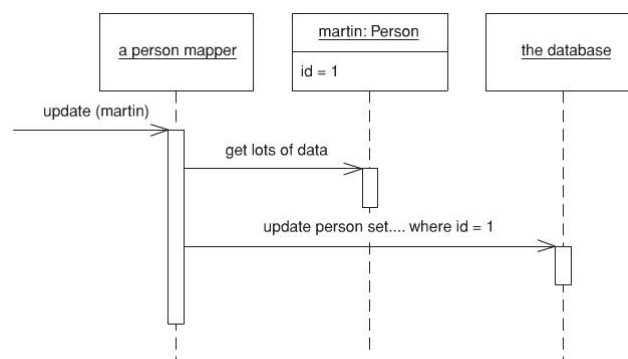
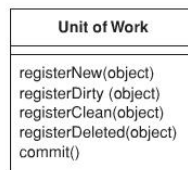


Figure 10.4 Updating data.

Unit of Work

Unit of Work

Maintains a list of objects affected by a business transaction and coordinates the writing out of changes and the resolution of concurrency problems.



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Unit of Work

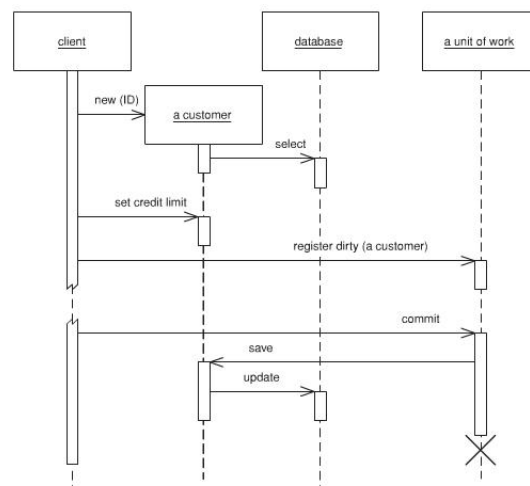
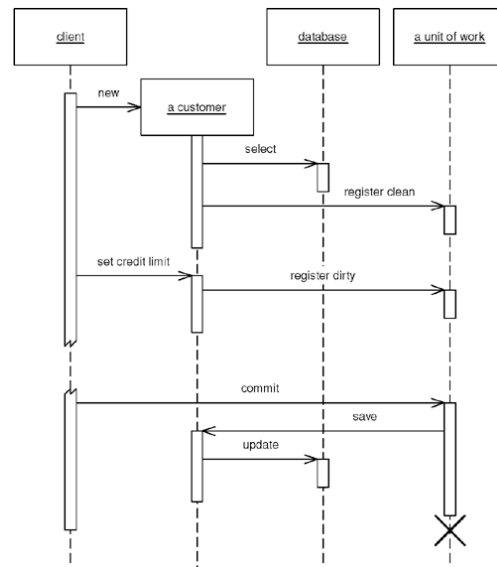


Figure 11.1 Having the caller register a changed object.

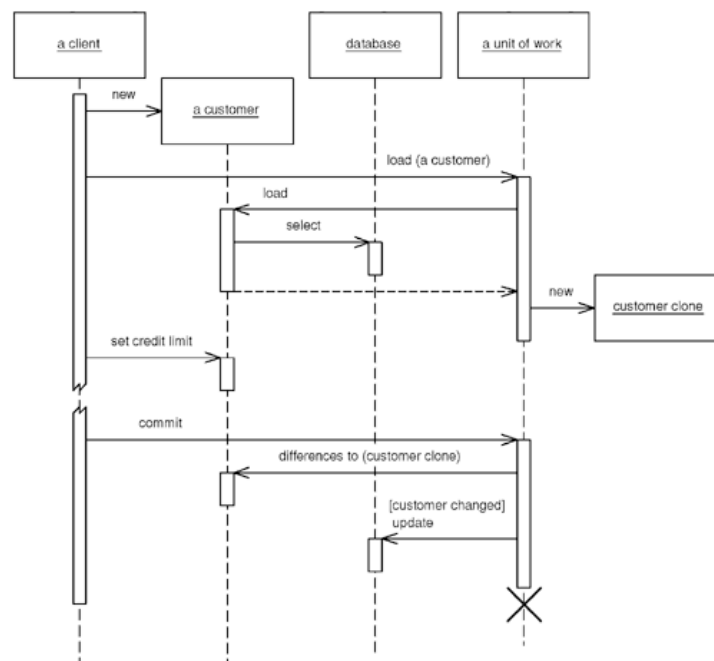
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Unit of Work



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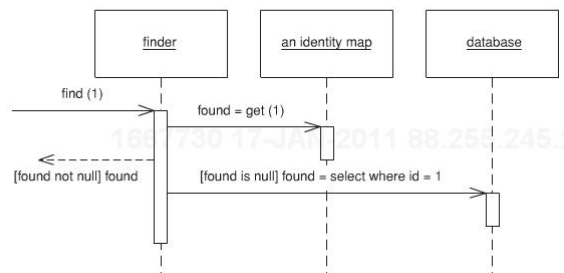


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Identity Map

Identity Map

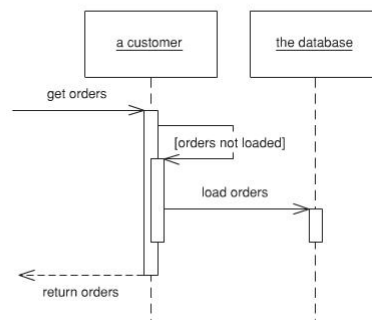
Ensures that each object gets loaded only once by keeping every loaded object in a map. Looks up objects using the map when referring to them.



Lazy Load

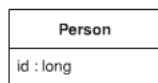
Lazy Load

An object that doesn't contain all of the data you need but knows how to get it.



Identity Field

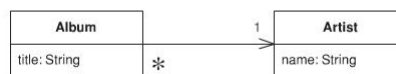
Saves a database ID field in an object to maintain identity between an in-memory object and a database row.



Foreign Key Mapping

Foreign Key Mapping

Maps an association between objects to a foreign key reference between tables.



Foreign Key Mapping

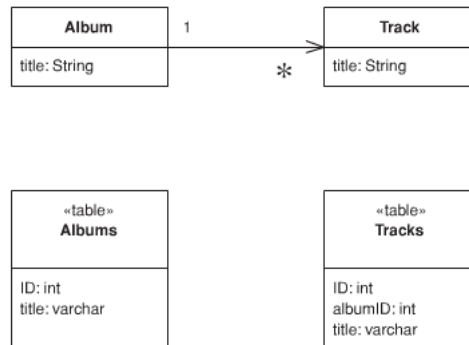


Figure 12.3 Classes and tables for a multivalued reference.

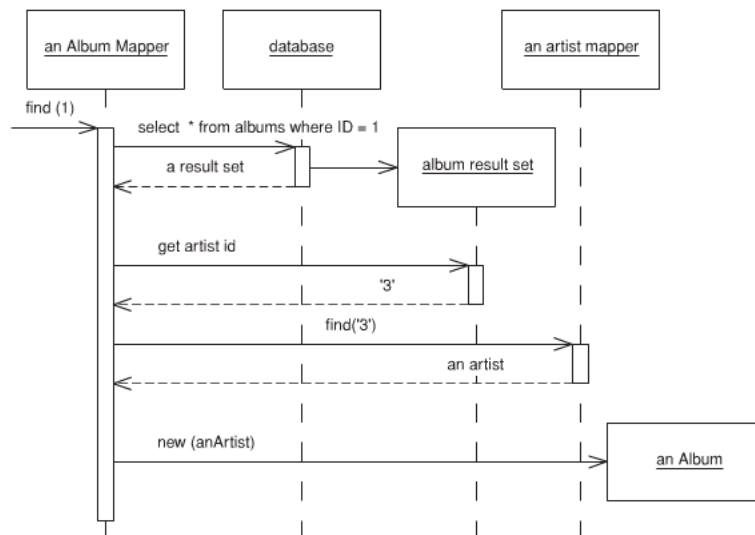
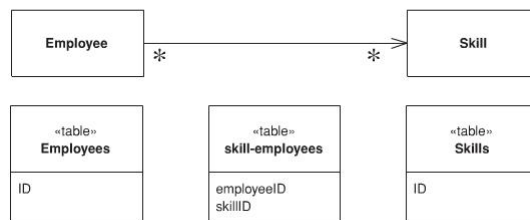


Figure 12.4 Sequence for loading a single-valued field.

Association Table Mapping

Association Table Mapping

Saves an association as a table with foreign keys to the tables that are linked by the association.



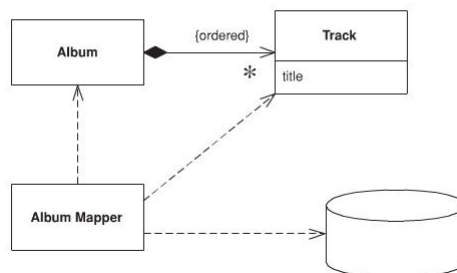
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Dependent Mapping

Dependent Mapping

Has one class perform the database mapping for a child class.



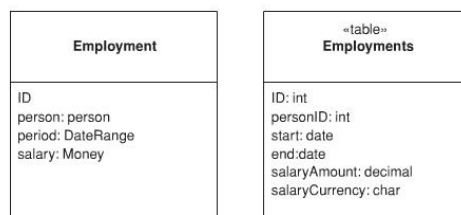
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Embedded Value

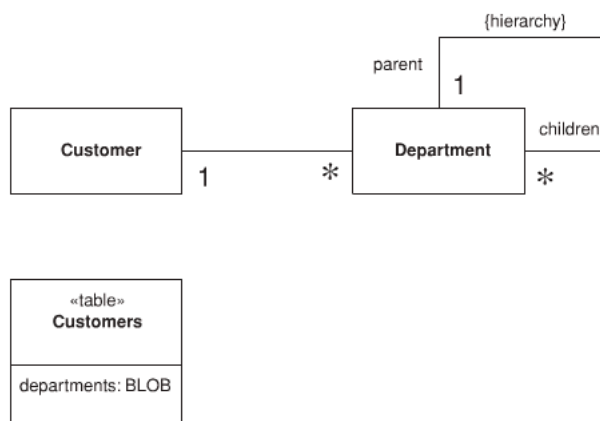
Embedded Value

Maps an object into several fields of another object's table.



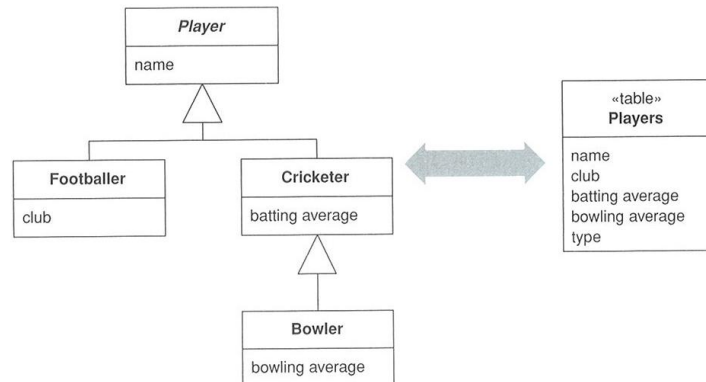
Serialized LOB

Saves a graph of objects by serializing them into a single large object (LOB), which it stores in a database field.



Single Table Inheritance

Represents an inheritance hierarchy of classes as a single table that has columns for all the fields of the various classes.

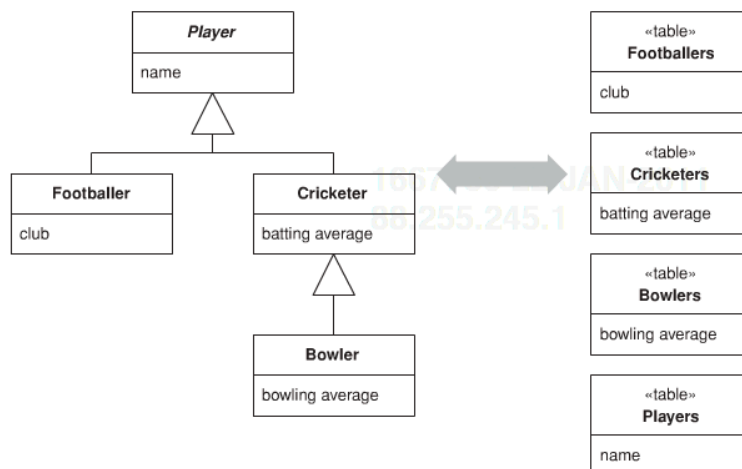


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Class Table Inheritance

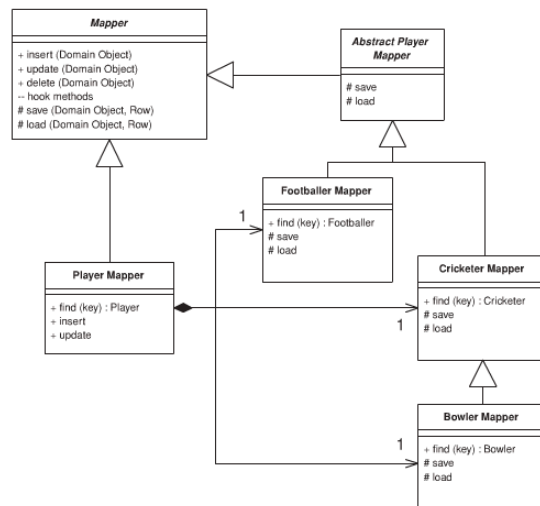
Represents an inheritance hierarchy of classes with one table for each class.



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Inheritance Mappers

A structure to organize database mappers that handle inheritance hierarchies.



Motivation: minimize the amount of code needed to save and load the data to the database.

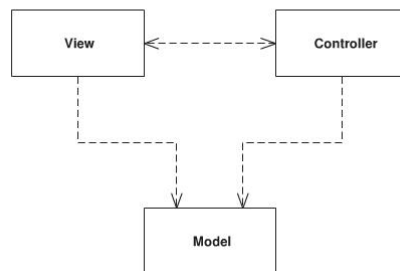
33

End

MVC

Model View Controller

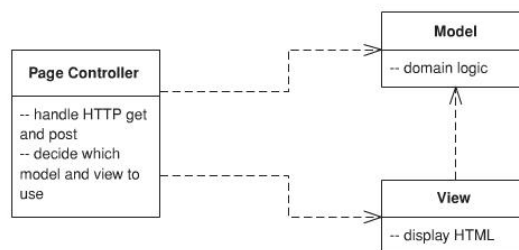
Splits user interface interaction into three distinct roles.



Page Controller

Page Controller

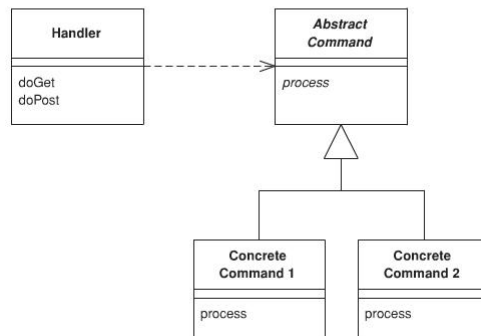
An object that handles a request for a specific page or action on a Web site.



Front Controller

Front Controller

A controller that handles all requests for a Web site.



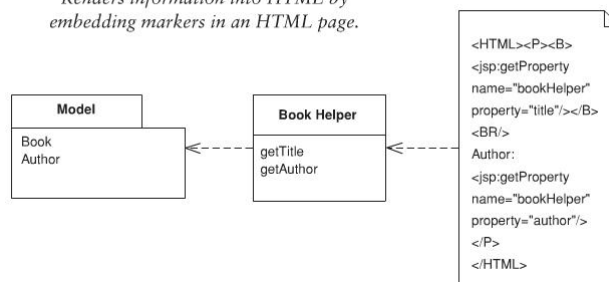
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Template View

Template View

Renders information into HTML by embedding markers in an HTML page.



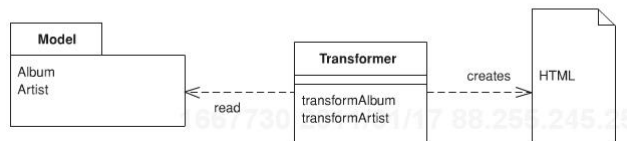
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Transform View

Transform View

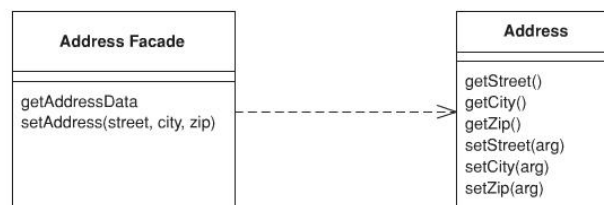
A view that processes domain data element by element and transforms it into HTML.



Remote Facade

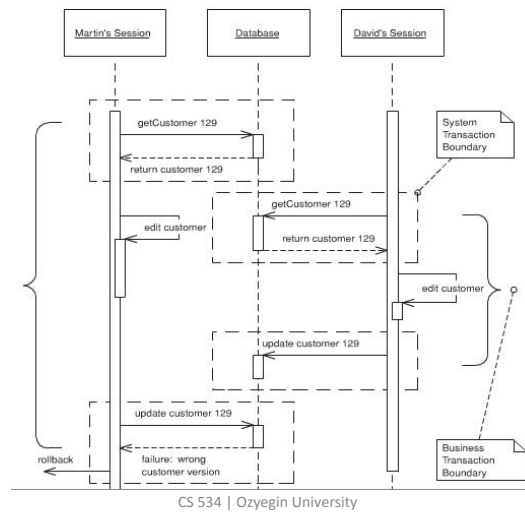
Remote Facade

Provides a coarse-grained facade on fine-grained objects to improve efficiency over a network.



Optimistic Offline Lock

Prevents conflicts between concurrent business transactions by detecting a conflict and rolling back the transaction.



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The revenue recognition problem

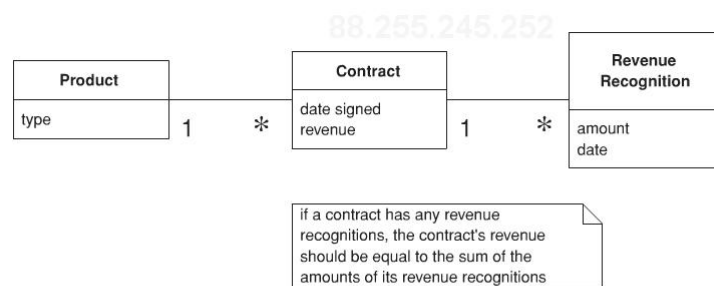


Figure 9.2 A conceptual model for simplified revenue recognition. Each contract has multiple revenue recognitions that indicate when the various parts of the revenue should be recognized.

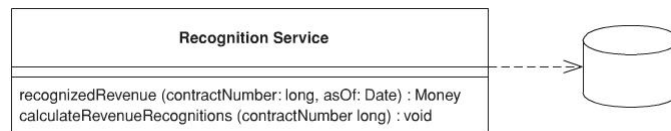
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Transaction Script

Transaction Script

Organizes business logic by procedures where each procedure handles a single request from the presentation.



Transaction Script

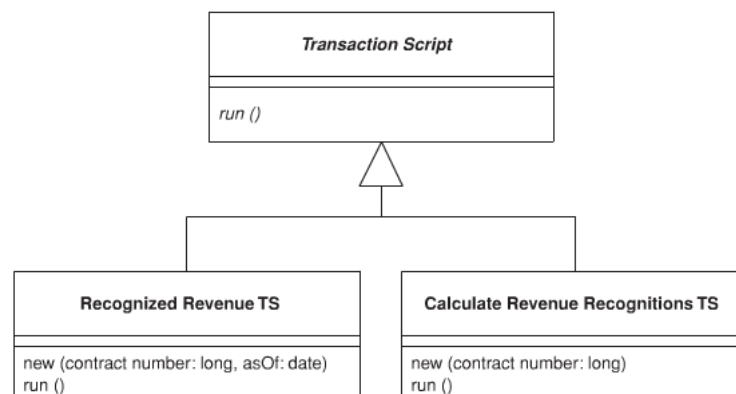
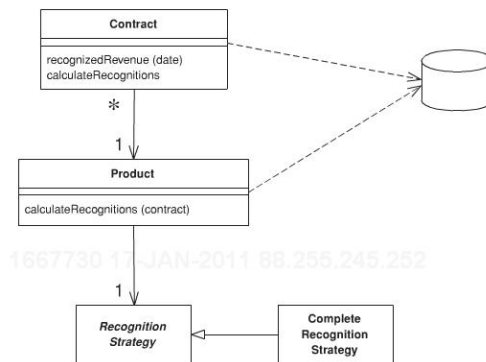


Figure 9.1 Using commands for Transaction Script.

Domain Model

Domain Model

An object model of the domain that incorporates both behavior and data.



Domain Model

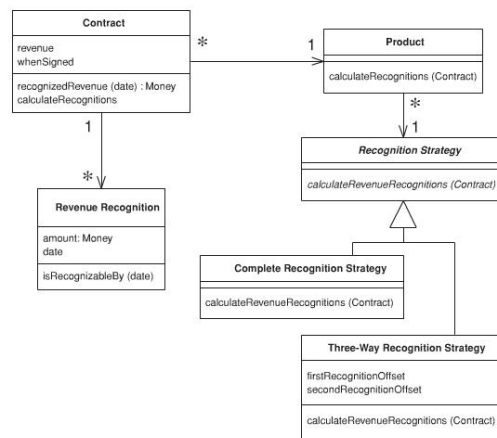


Figure 9.3 Class diagram of the example classes for a Domain Model.

Table Module

Table Module

A single instance that handles the business logic for all rows in a database table or view.

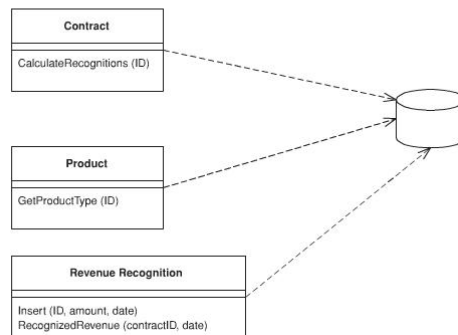


Table Module

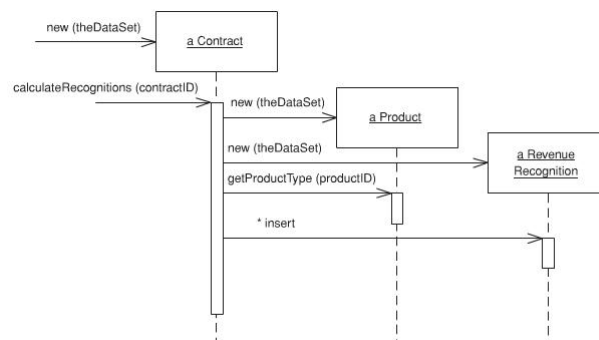


Figure 9.4 Several Table Modules can collaborate with a single Record Set (508).

Table Module

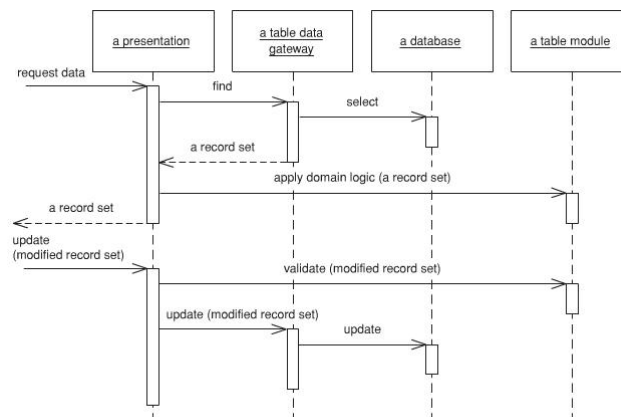


Figure 9.5 Typical interactions for the layers around a Table Module.

Table Module

The revenue recognition problem

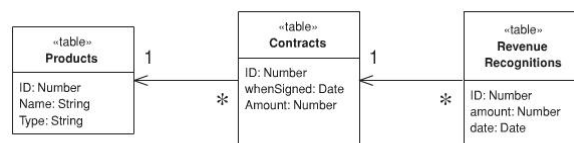
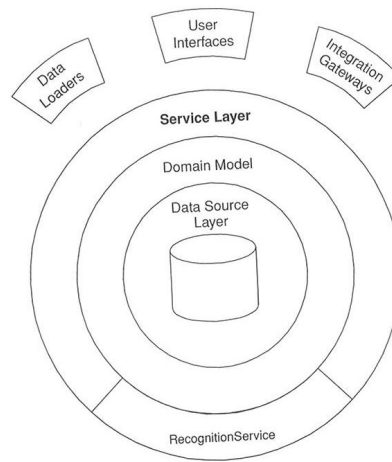


Figure 9.6 Database schema for revenue recognition.

Service Layer



Service Layer Revenue Recognition

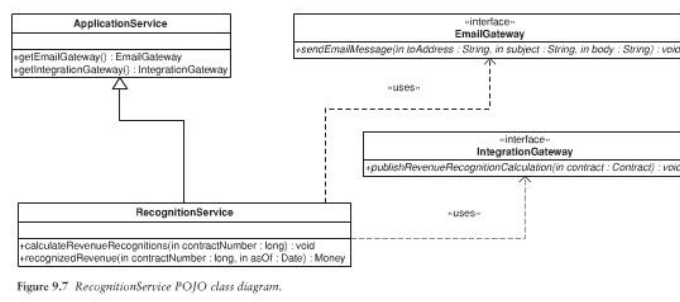


Figure 9.7 RecognitionService POJO class diagram.

Service Layer

Revenue Recognition

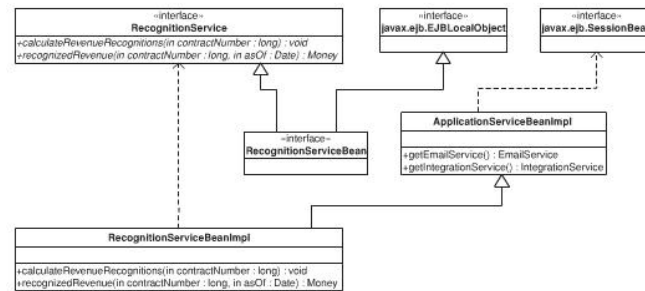


Figure 9.8 RecognitionService EJB class diagram.