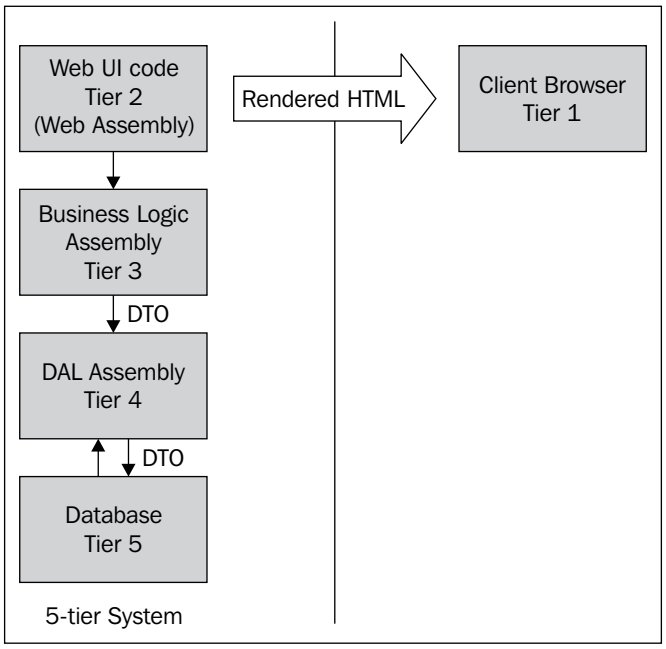
8
Database Design

In the first two chapters, we learnt that we could divide our whole application into the following tiers:

- **Presentation Layer**: This is the client browser.
- **The UI layer**: An ASP.NET website having ASPX/ASCX web pages.
- **Business Logic Layer** (**BLL**): This contains the business logic code.
- **Data Access Layer** (**DAL**): This contains the data access code that talks to the data layer.
- **Common Tier**: This is just a class library that contains the Data Transfer Objects, or DTOs, used to pass data between the tiers. This tier also contains utility or helper methods that are common to all of the tiers.
- **Data Layer** (**DL**): This is the physical database, such as the MS SQL Server; this can include text files or XML Files.

For the sake of convenience, let us revisit the diagram from Chapter 4 to see how all these tiers were interacting in a 5-tier system:



So far, we have focused on the UI, the BLL and the DAL layers, understanding the different application architectural approaches as well as different design and implementation methods that can be used to make the overall architecture more scalable and robust. But we really did not focus on how the actual database or the **Data Layer** (**DL**) can play an important role in making our application architecture better. This chapter is exclusively dedicated to modeling as well as designing our data layer.

In this chapter, we will try to understand:

- The importance of a well designed database
- Database Architecture and Design
- The Logical Data Model
- The Physical Data Model
- Normalization
- What Data Integrity is
- Using MS Visio to create a data model