### Chapter 1 The Database Environment and Development Process

**Chapter Overview**

The purpose of this chapter is to introduce students to the database approach to information systems development, the important concepts and principles of the database approach, and the database development process within the broader context of information systems development. This is an important chapter because it conveys a sense of the central importance of databases in today’s information systems environment and in all modern enterprises. The idea of an organizational database is intuitively appealing to most students. However, many students will have little or no background or experience with the technical implementation of databases. Others will have had some experience with database management systems intended for personal or workgroup use (such as Microsoft Access). Consequently, they will have a limited perspective concerning an organizational approach to databases.

In this chapter we introduce the basic concepts and definitions of databases. We contrast data with information, and introduce the notion of metadata and its importance. We contrast the database approach with older file processing systems, and introduce the Pine Valley Furniture Company case to illustrate these concepts. We describe the range of database applications from databases with a personal or workgroup scope to enterprise databases and identify key decisions that must be made for each type of database. We describe both the potential benefits and typical costs of using the database approach. We also trace the historical evolution of database systems, in order to provide a context for understanding the database approach for data storage and retrieval.

The chapter also presents an expanded description of the systems development life cycle (including an introduction to rapid application development methods of prototyping and agile software development) and the role of database development within it. The chapter provides an updated description of the well-known three-schema architecture and uses it to summarize the various deliverables of database development. The chapter concludes with an example of database development situated in the context the Pine Valley Furniture Company case.

**Chapter Objectives**

1. Create a sense of excitement concerning the data and database management field and the types of job opportunities that are available.
2. Acquaint students with the broad spectrum of database applications and how organizations are using database applications for competitive advantage.
3. Introduce the key terms and definitions that describe the database environment.
4. Describe data models and how they are used to capture the nature and relationships among data.
5. Describe the major components of the database environment and how these components interact with each other.
6. Provide a review of systems development methodologies, particularly the systems development life cycle, prototyping, and agile software development; build an understanding of how database development is aligned with these methodologies.
7. Develop an understanding of the different roles within in a database development team.
8. Make students aware of the three-schema architecture and its benefits for database development and design.
9. Introduce the Pine Valley Furniture Company case, which is used throughout the text to illustrate important concepts.
10. Introduce the Mountain View Community Hospital case, which is included at the end of each chapter as a source for student projects.

**Key Terms**

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| Agile software development | Database | Metadata |
| Conceptual schema | Database application | Physical schema |
| Constraint | Database management system (DBMS) | Prototyping |
| Data | Enterprise data modeling | Relational database |
| Data independence | Enterprise resource planning (ERP) | Repository |
| Data model | Entity | Systems development life cycle (SDLC) |
| Data modeling and design tools | Information | User view |
| Data warehouse | Logical schema |  |