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<<数据库系统>>

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前言

Background The history of database research over the past 30 years is one of exceptional productivity that has led to the database system becoming arguably the most important development in the field of software engineering. The database is now the underlying framework of the information system and has fundamentally changed the way many organizations operate. In particular, the developments in this technology over the last few years have produced systems that are more powerful and more intuitive to use. This development has resulted in increasing availability of database systems for a wider variety of users. Unfortunately, the apparent simplicity of these systems has led to users creating databases and applications without the necessary knowledge to produce an effective and efficient system. And so the software crisis?or, as it is sometimes referred to, the software depression?continues. The original stimulus for this book came from the authors?work in industry, providing consultancy on database design for new software systems or, as often as not, resolving inadequacies with existing systems. In addition, the authors?move to academia brought similar problems from different users students. The objectives of this book, therefore, are to provide a textbook that introduces the theory behind databases as clearly as possible and, in particular, to provide a methodology for database design that can be used by both technical and nontechnical readers. The methodology presented in this book for relational Database Management Systems (DBMSs) the predominant system for business applications at present has been tried and tested over the years in both industrial and academic environments. It consists of three main phases: conceptual, logical, and physical database design. The first phase starts with the production of a conceptual data model that is independent of all physical considerations. This model is then refined in the second phase into a logical data model by removing constructs that cannot be represented in relational systems. In the third phase, the logical data model is translated into a physical design for the target DBMS. The physical design phase considers the storage structures and access methods required for efficient and secure access to the database on secondary storage. The methodology in each phase is presented as a series of steps. For the inexperienced designer, it is expected that the steps will be followed in the order described, and guidelines are provided throughout to help with this process. For the experienced designer, the methodology can be less prescriptive, acting more as a framework or checklist. To help the reader use the methodology and understand the important issues, the methodology has been described using a realistic worked example, based on an integrated case study, DreamHome. In addition, three additional case studies are provided in Appendix B to allow readers to try out the methodology for themselves. UML (Unified Modeling Language) Increasingly, companies are standardizing the way in which they model data by selecting a particular approach to data modeling and using it throughout their database development projects. A popular high-level data model used in conceptual/ logical database design, and the one we use in this book, is based on the concepts of the Entity-Relationship (ER) model. Currently there is no standard notation for an ER model. Most books that cover database design for relational DBMSs tend to use one of two conventional notations: ● Chen notation, consisting of rectangles representing entities and diamonds representing relationships, with lines linking the rectangles and diamonds; or ● Crow Feet notation, again consisting of rectangles representing entities and lines between entities representing relationships, with a crow謁 foot at one end of a line representing a one-to-many relationship. ……

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内容概要

本书是数据库领域的经典著作，内容系统全面，实用性强，被世界多所大学选为数据库相关课程的教材。
全书主要内容有：数据库系统和数据库设计的基本知识；关系模型和关系语言；数据库分析和设计的主要技术；数据库设计方法学；数据库安全、事务管理、查询处理与优化；分布式DBMS与数据复制技术；面向对象数据库技术；DBMS与Web技术的结合，半结构化数据与XML；与商务智能有关的一些日益重要的技术，包括数据仓库、联机分析处理和数据挖掘以及数据库架构等。

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章节摘录

版权页：插图：The Database Management System （DBMS） is now the underlying framework of the information system and has fundamentally changed the way in which many organizations operate. The database system remains a very active research area and many significant problems remain.The predecessor to the DBMS was the file-based system, which is a collection of application programs that perform services for the end-users, usually the production of reports. Each program defines and manages its own data. Although the file-based system was a great improvement over the manual filing system, it still has significant problems, mainly the amount of data redundancy present and program——data dependence.The database approach emerged to resolve the problems with the file-based approach. A database is a shared collection of logically related data and a description of this data, designed to meet the information needs of an organization. A DBMS is a software system that enables users to define, create, maintain,and control access to the database. An application program is a computer program that interacts with the database by issuing an appropriate request （typically a SQL statement） to the DBMS. The more inclusive term database system is used to define a collection of application programs that interact with the database along with the DBMS and database itself.

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