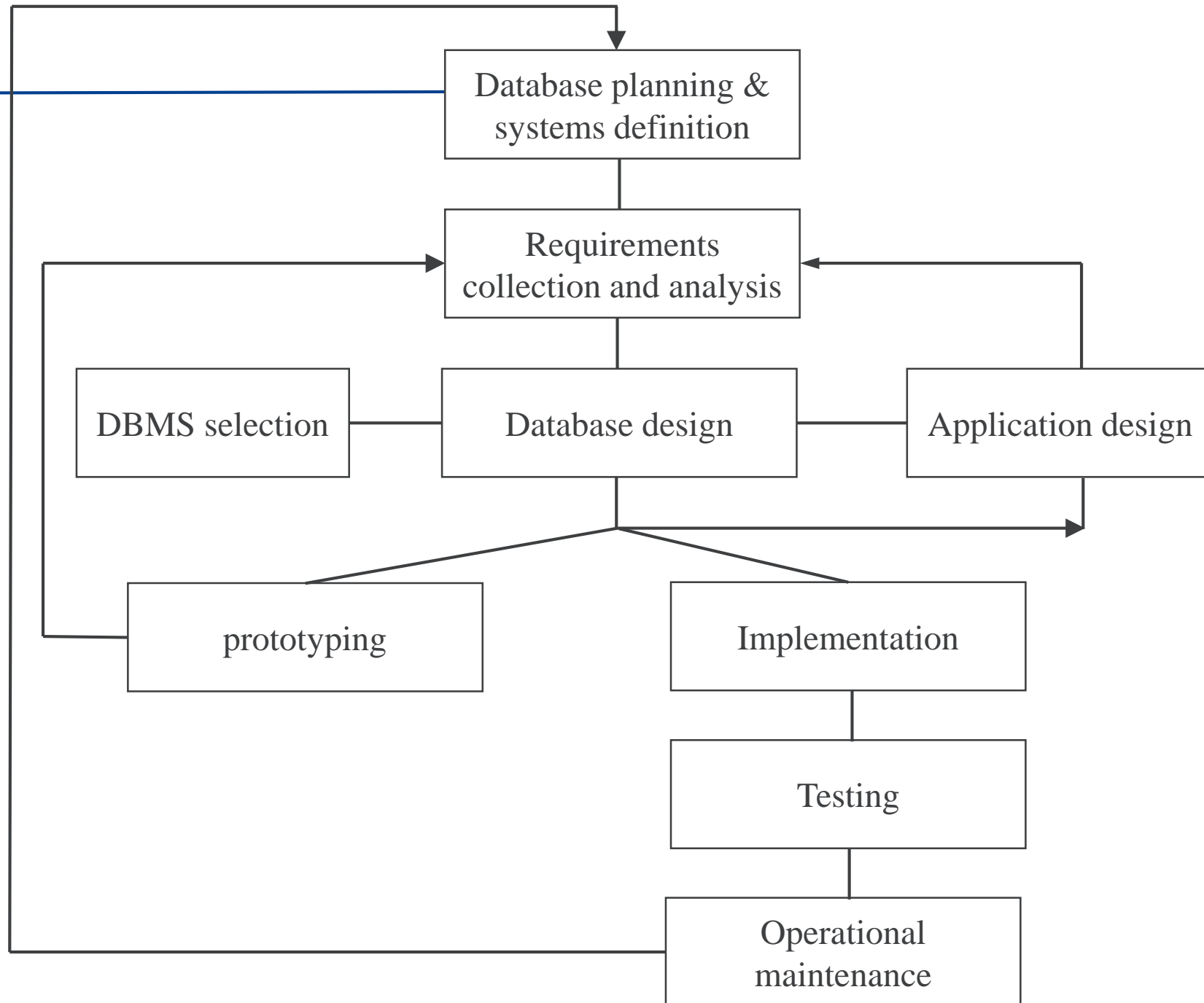# 数据库设计概述

讲解人：陆伟 教授

数据库系统生存周期

☐ The database is a fundamental component of an information system.

☐ The lifecycle of an organization's information system is inherently linked to the lifecycle of the database system that supports it.

```
Database planning &
systems definition
        ↓
Requirements
collection and analysis
        ↓
DBMS selection — Database design — Application design
        ↓
  prototyping        Implementation
                        ↓
                      Testing
                        ↓
                   Operational
                   maintenance
```
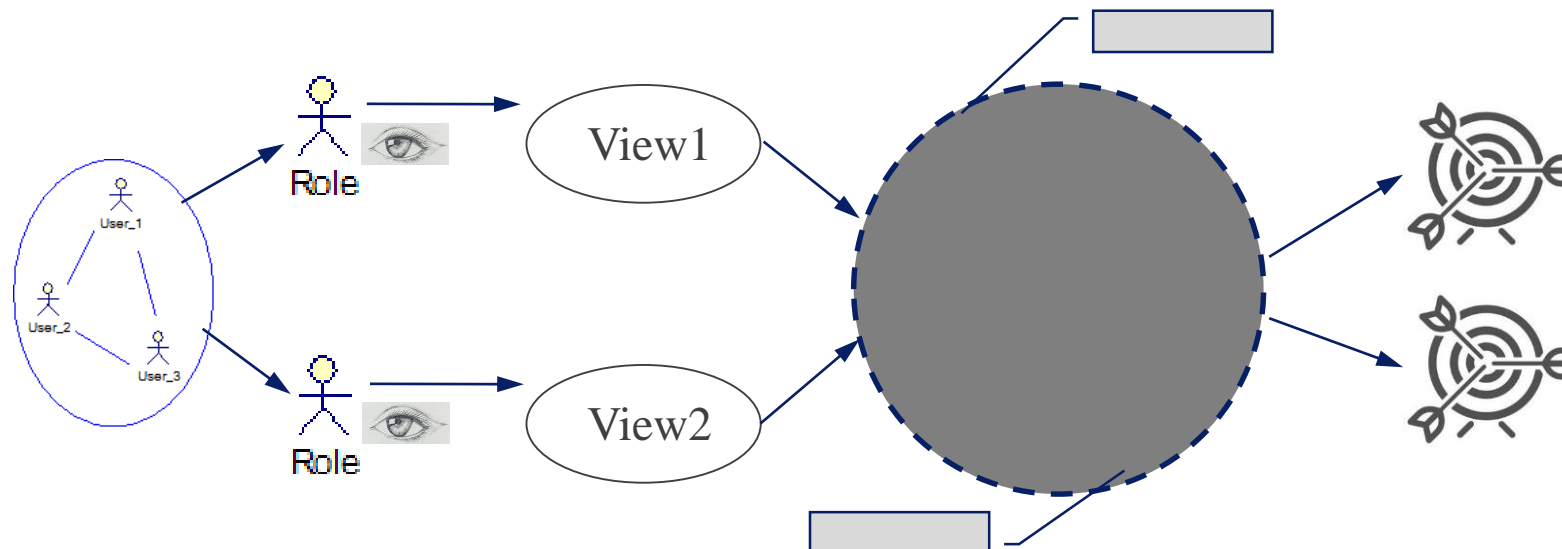
数据库系统生存周期

□ Database Planning
  – The management activities that allow the stages of the database application to be realized as efficiently and effectively as possible.

□ The most important objective of database plan is to clearly define the mission statement and mission objectives.

□ There are three main issues involved：
  – Identification of enterprise plans and goals with subsequent determination of information systems needs.

  – Evaluation of current information systems to determine existing strengths and weaknesses.

  – Appraisal of IT opportunities that might yield competitive advantage.

□ Database planning should also include the development of relative standards.

数据库系统生存周期

□ System definition

– Describes the scope and boundaries of the database application and the major user views.

□ A user view defines what is required of a database application in terms of the data to be held and the transactions to be performed on the data. A database application may have one or more user views. A user view may be distinct to overlap with other views.

数据库系统生存周期

☐ Requirements collection and analysis
  – The process of collecting and analyzing information about the part of the organization that is to be supported by the database application, and using this information to identify the user's requirements of the new system.
☐ There are many techniques for gathering this information, called fact-finding techniques. Anyway identifying the user's requirements is a difficult thing because…
☐ Requirements are described in documents refer to as requirements specifications.
☐ Requirements specification techniques
  – Structured Analysis and Design (SAD) –Data Flow Diagrams (DFD)
  – UML –Other CASE tools

数据库系统生存周期

- ❑ Database Design
  - – The process of creating a design for a database that will support the enterprise's operations and objectives.
- ❑ Database design is an iterative process, which has a starting point and an almost endless procession of refinements.
- ❑ Phases of Database Design
  - – Conceptual database design
  - – Logical database design
  - – Physical database design

数据库系统生存周期

☐ Conceptual database design
  – The process of constructing a model of the information used in an enterprise.
  – It is entirely independent of implementation details such as the target DBMS software, application programs, programming languages, hardware platform, or any other physical considerations.

☐ Logical database design
  – The process of constructing a model of the information used in an enterprise based on a special data model, but independent of a particular DBMS and other physical consideration.

☐ Physical database design
  – The process of producing a description of the implementation of the database on secondary storage.
  – It is tailored to a specific DBMS system.

数据库系统生存周期

☐ DBMS Selection

数据库系统生存周期

- ❑ Application Design
  - – The design of the user interface and the application programs that use and process the database.
  - – Transaction Design
  - – User Interface Design

数据库系统生存周期

☐ Prototyping

数据库系统生存周期

☐ Implementation

数据库系统生存周期

- ☐ Data Conversion and Loading

数据库系统生存周期

☐ Testing

数据库系统生存周期

- ☐ Operational Maintenance

数据库系统生存周期

☐ About Documents for each Stage

数据库应用程序生存期阶段	收集的数据	生成的文档
数据库规划	数据库项目的目标和任务	数据库应用程序的任务陈述和任务目标
系统定义	描述主要用户视图	定义数据库应用程序的分为和边界；定义要支持的用户视图
需求收集和分析	用户视图和系统需求	用户和系统需求说明书
数据库设计	验证逻辑数据库设计的用户反映；目标 DBMS 提供的功能；	概念/逻辑数据库设计；物理数据库设计
应用程序设计	用户对界面设计的反映	应用程序设计
DBMS 选择	目标 DBMS 提供的功能	DBMS 的评估和推荐
建立原型	用户对系统原型的反响	改进的用户需求和系统需求说明书
实现	目标系统提供的功能	
数据转换和加载	当前数据的格式；目标 DBMS 的数据导入性能	
测试	测试结果	采用的测试策略；测试结果分析
运行维护	性能测试结果;用户和系统需求的增加和变化	用户手册；性能分析；改变的用户需求和系统说明书

关于本讲内容

祝各位学习愉快！

感谢观看！

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