* 介绍几种系统设计策略
* 描述一个信息系统开发项目中设计阶段的任务

**Systems design** – the specification of a detailed computer-based solution.

* + Also called **physical design**.
  + systems analysis emphasizes the business problem
  + systems design emphasizes the technical or implementation concerns of the system.

System Design Approaches

* Model-Driven
  + Modern structured design
  + Information engineering
  + Prototyping
  + Object-oriented
* RAD

**Object-oriented design (OOD)** techniques are used to refine the object requirements definitions identified earlier during analysis, and to define design specific objects.

* + 对象技术试图消除“数据”和“过程”内容的分离

**Rapid application development (RAD)** – 反复使用结构化技术和原型化技术来定义用户的需求并设计最终系统。

模型-原型-模型-原型…

最总得出一个组合的业务需求和技术设计陈述，它们用以构造新系统

System Design Tasks For In-House Development (Build)

* Design the Application Architecture
  + Define technologies to be used by (and used to build) one, more, or all information systems.
  + Revise（修改） models as physical models
* Design the System Databases
  + Database schema
  + Optimized for implementation DBMS
* Design the System Interface
  + Input, output, and dialogue specifications
  + Prototypes
* Package Design Specifications
  + Specifications to guide programmers
* Update Project Plan

**Physical data flow diagram (DFDs)** – a process model used to communicate the technical implementation characteristics of an information system.

* + Communicate technical choices and other design decisions to those who will actually construct and implement the system.

**Physical process** – either a *processor*, such as a computer or person, or a technical implementation of specific work to be performed, such as a computer program or manual process.

* + A logical process may be split into multiple physical processes:
    - 为了将过程分解为人和计算机执行的部分
    - 为了将过程分解成使用一种技术实现的部分和使用另一种技术实现的部分
    - 统一过程的多种实现（如同一个过程可以手工或计算机实现）
    - 增加新过程为了处理例外和安全需要

如果逻辑过程一部分由人实现，一部分由软件实现，那么必须把它分解成不同的物理过程

Physical Data Stores

Implementation :

* + A database
  + A table in a database
  + A computer file
  + A tape or media backup of anything important
  + A temporary file or batch
  + Any type of noncomputerized file

系统架构（分层）：Computing Layers

* **Presentation layer**—the user interface
* **Presentation logic layer**—processing that must be done to generate the presentation, such as editing input data or formatting output data.
* **Application logic layer**—the logic and processing to support business rules, policies, and procedures
* **Data manipulation layer**—to store and retrieve data to and from the database
* **Data layer**—the actual business data

Client/Server Architecture — Servers

* **Database** **server** – a server that hosts one or more databases and executes all data manipulation commands at the server.
* **Transaction server** – a server that hosts services which ensure that all database updates for a transaction succeed or fail as a whole.
* **Application server** – a server that hosts application logic and services for an information system.
* **Messaging or groupware server** – a server that hosts services for e-mail, calendaring, and other work group functionality.
* **Web server** – a server that hosts Internet or intranet websites.

**Network computing system** – presentation and presentation logic layers implemented in client-side Web browsers using content downloaded from a Web server.

* + Presentation logic layer connects to application logic layer running on application server, which connects to database servers on the backside of the system.
  + The greatest potential of this approach is its applicability to redesign of traditional information systems to run on an intranet.

**Intranet** – a secure network that uses Internet technology to integrate desktop, work group, and enterprise computing into a cohesive framework.

Drawing Physical DFDs for Network Architecture

* Develop a physical data flow diagram (DFD) for the network architecture.
  + Each process symbol represents a server or class of clients.
* For each processor, develop a physical DFD to show the event processes (from Chapter 9) that are assigned to that processor.
* All but simple processes should be factored into design units and modeled as a more detailed physical DFDs.

Data Distribution Options

* Store all data on a single server.
* Store specific tables on different servers.
* Store subsets of specific tables on different servers.
* Replicate (duplicate) specific tables or subsets on different servers.