

IT 775

Database Technology

Database

Development Cycle

Database Scope

- Databases can vary in their scope from small single-user (personal) databases to large enterprise databases that can be used by thousands of end-users
- Regardless of their scope, all databases go through the same fundamental development steps (*requirements, modeling, implementation, deployment, use, etc.*)

Operational versus Analytical Databases

- **Operational information (transactional information)** - the information collected and used in support of day to day operational needs in businesses and other organizations
- **Operational database** - collects and presents operational information in support of daily operational procedures and processes
- **Analytical information** - the information collected and used in support of analytical tasks
 - Analytical information is based on operational (transactional) information
- **Analytical database** - collects and presents analytical information in support of analytical tasks

People Involved with Database Systems

- **Database analysts, designers, and developers**
 - **Database analysts** - involved in the requirements collection, definition, and visualization stage
 - **Database designers** (a.k.a. **database modelers** or **architects**) - involved in the database modeling stage
 - **Database developers** – in charge of implementing the database model as a functioning database using the DBMS software

People Involved with Database Systems

- **Front-end applications analysts and developers**
 - **Front-end application analysts** - in charge of collecting and defining requirements for front-end applications
 - **Front-end applications developers** - in charge of creating the front-end applications

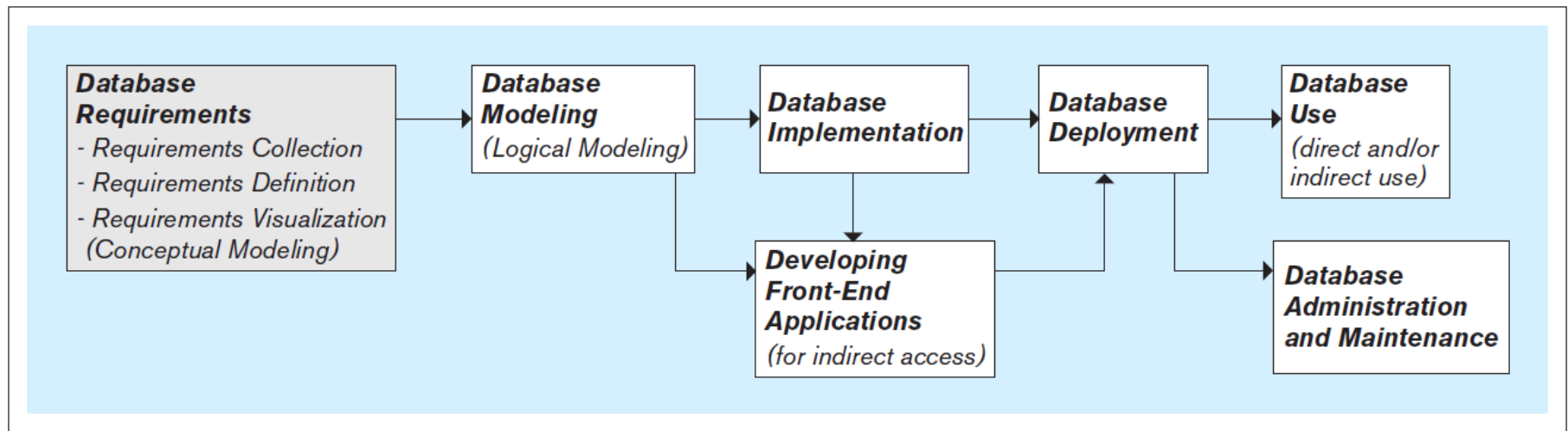
People Involved with Database Systems

- **Database administrators (DBAs)** - perform the tasks related to the maintenance and administration of a database system

People Involved with Database Systems

- **Database end users** - use a database system to support their work- or life-related tasks and processes
 - Users differ in:
 - Level of technical sophistication
 - Amount of data that they need
 - Frequency with which they access the database system

Database Systems Development Steps



Database Systems Development Steps

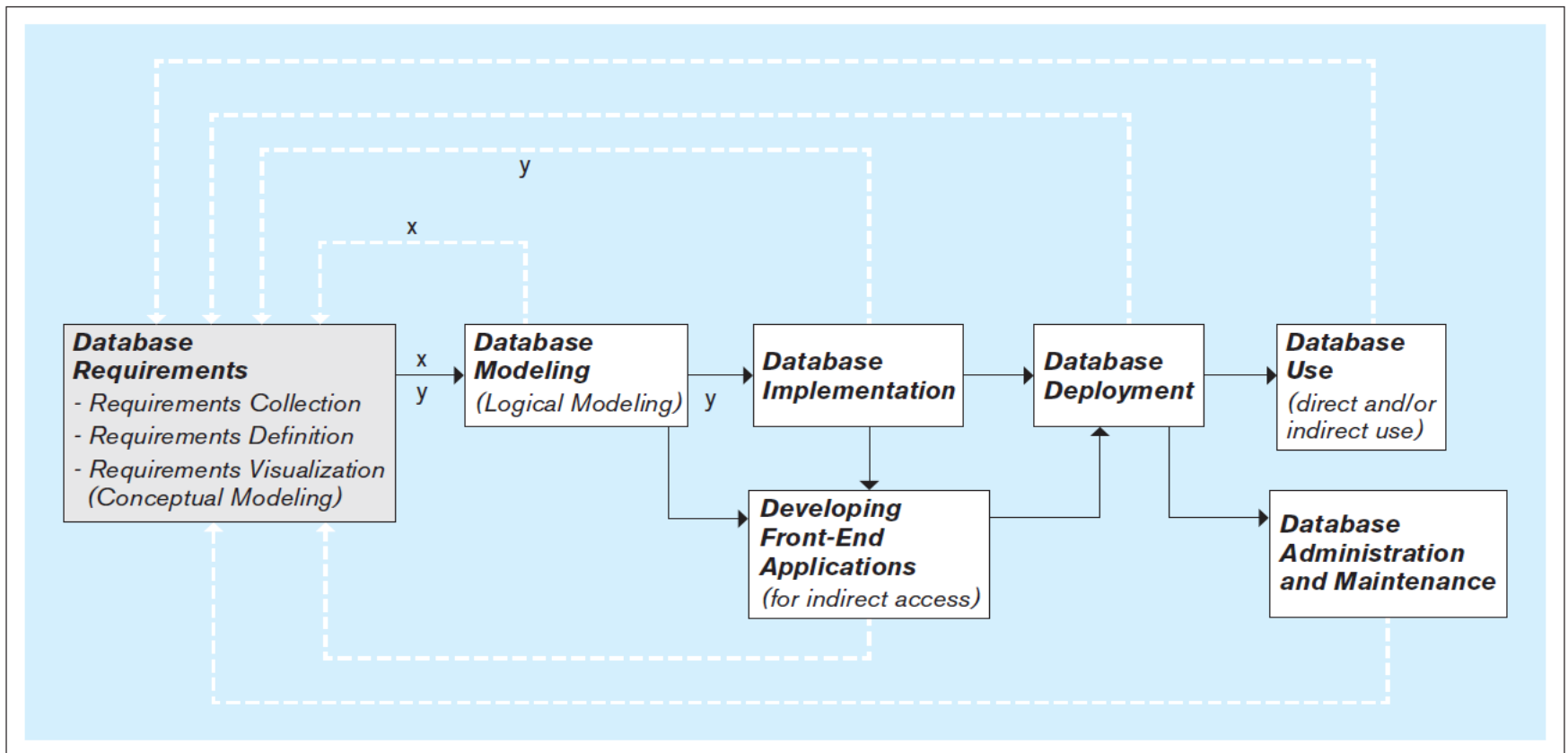
- **Requirements collection, definition, and visualization** - results in the requirements specifying which data the future database system will hold and in what fashion, and what the capabilities and functionalities of the database system will be
 - The **collected** requirements should be clearly **defined** and stated in a written document, and then **visualized**

Database Systems Development Steps

- **Requirements collection, definition, and visualization**
 - **Conceptual database model** – a visualization of requirements by using a conceptual data modeling technique (such as entity-relationship [ER] modeling)

Database Systems Development Steps

Iterative nature of the database requirements collection, definition, and visualization process



Database Systems Development Steps

- **Database modeling (logical database modeling)** - creation of the database model that is implementable by the DBMS software
 - *Logical database modeling follows conceptual database modeling*

Database Systems Development Steps

- **Database implementation** - using a DBMS to implement the database model as an actual database
 - Most modern databases are implemented using a relational DBMS (RDBMS) software

Database Systems Development Steps

- **Developing front-end applications** - designing and creating applications for indirect use by the end-users
 - Front-end applications are based on the database model and the requirements specifying the front-end functionalities
 - Front-end applications contain interfaces (such as forms and reports) accessible via a navigation mechanism (such as a menu)

Database Systems Development Steps

- **Database deployment** - releasing the database system for use by the end users

Database Systems Development Steps

- **Database use** - the insertion, modification, deletion and retrieval of the data in the database system

Database Systems Development Steps

- **Database administration and maintenance** - performing activities that support the database end user, including dealing with technical issues, such as:
 - Providing security for the information contained in the database
 - Ensuring sufficient hard-drive space for the database content
 - Implementing the backup and recovery procedures

The Next Version of the Database

- Follows the same development steps as the initial version

