

ITC 250/CPET 499 Web Systems

Nov. 8, 2016

Lectures

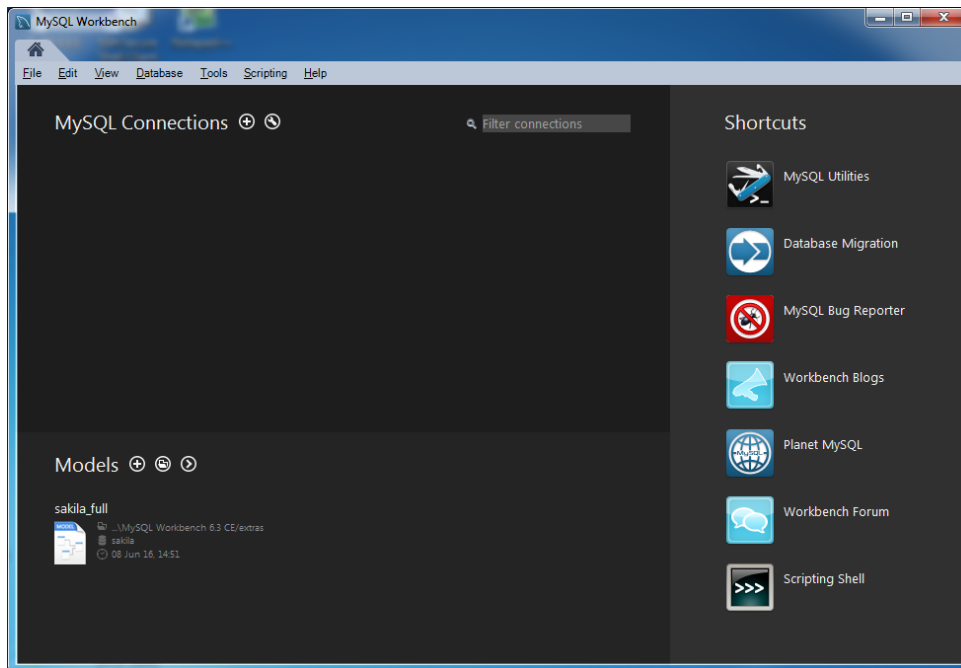
Advanced Topics

Topics

- **Enterprise Information System Modeling & Design**
 - Enterprise Information Service – Operation Environment
 - Enterprise Integration: Web Server System
 - Web-based Databases
 - Mobile Sales Automation System
 - Data Conversion Workflow
- **Data Analysis, Modeling and Design (Web-based System)**
 - Data Input, Process, Store & Display
 - Forms, Reports, Screen of data
 - Data Modeling Workflow
 - Logical Data Structure
 - Graphical Data Model
 - Schemas
 - A model of the structure of a database
 - Describe the kinds of data as realized in specific implementation model, such as the relational model or the object-oriented model
 - Physical Data Storage
 - Business Data Processing
 - Data => Information
 - Restrictions
 - Constraints
 - Business Rules
 - Legal Issues
 - Users
 - Documentation
- **Database Design, Development, Administration and Migration**

References

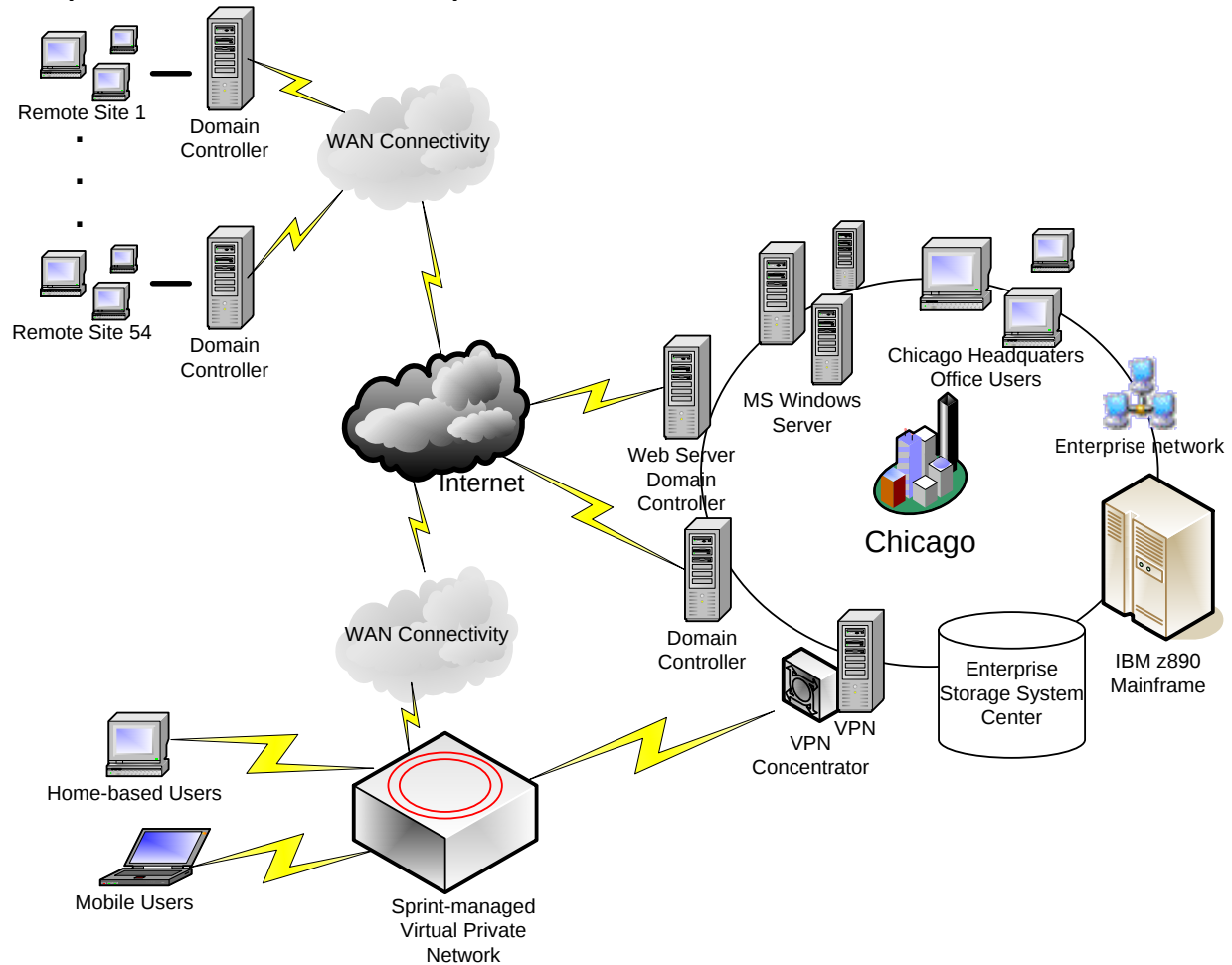
- MySQL Workbench, <http://dev.mysql.com/downloads/workbench/>
- MySQL Topic Guides, <https://dev.mysql.com/doc/index-topic.html>
- MySQL Workbench: Database Design, Development, Administration, and Migration, <https://www.mysql.com/why-mysql/white-papers/mysql-workbench-database-design-development-administration/>
- Virtual Database Schema Design, <https://www.mysql.com/products/workbench/design/>



Enterprise Information System Modeling and Design

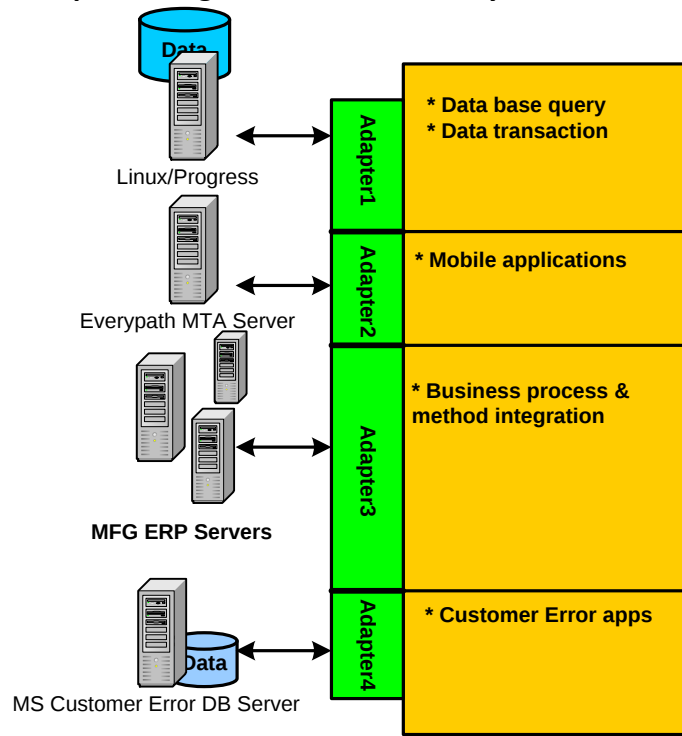
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Enterprise Information Service – Operation Environment



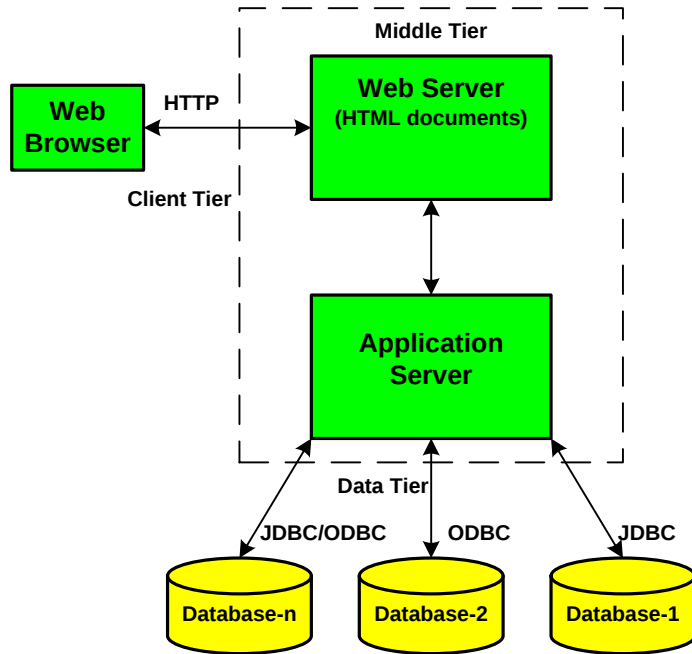
XYZ Enterprise Information Service
Operation Environment

Enterprise Integration: Web Server System

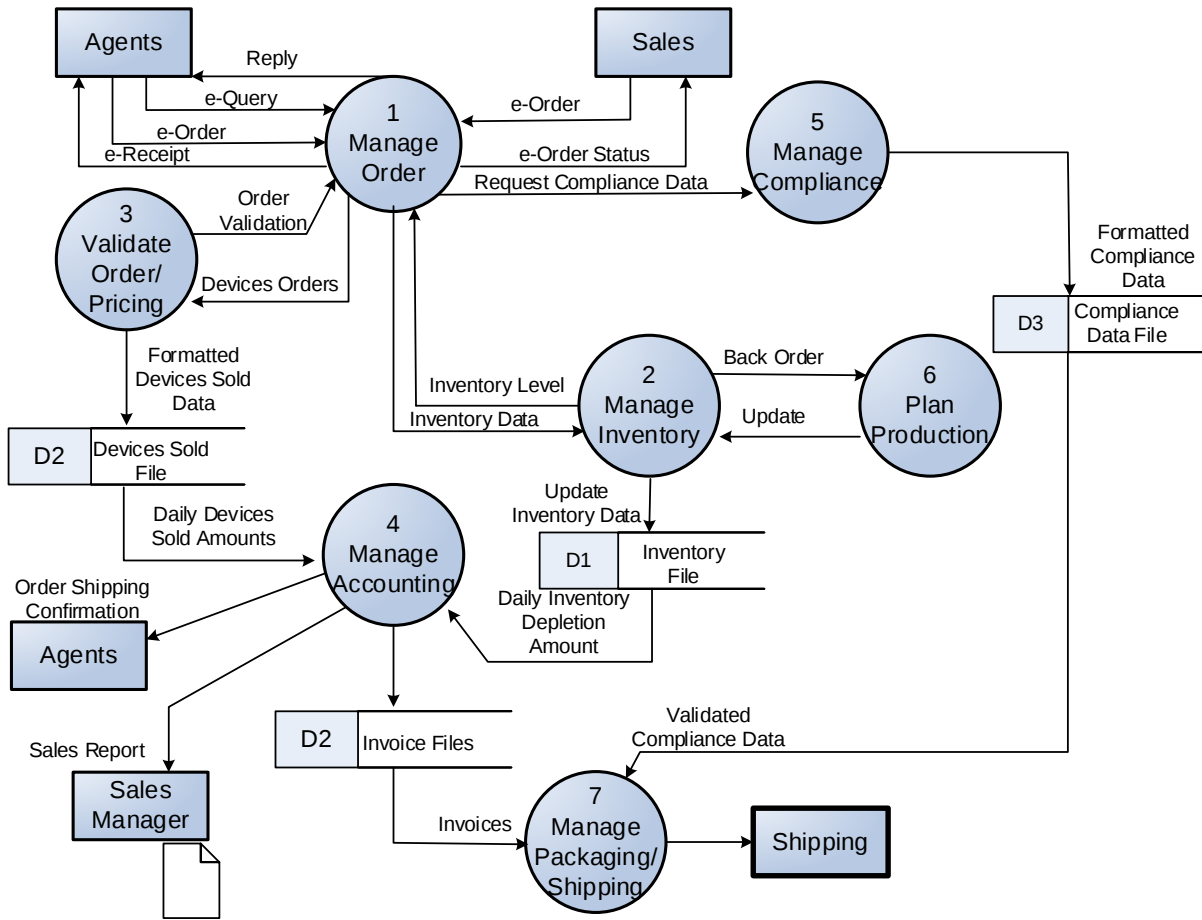


Enterprise Integration
Web Server (EIWS)

Web-Based Databases

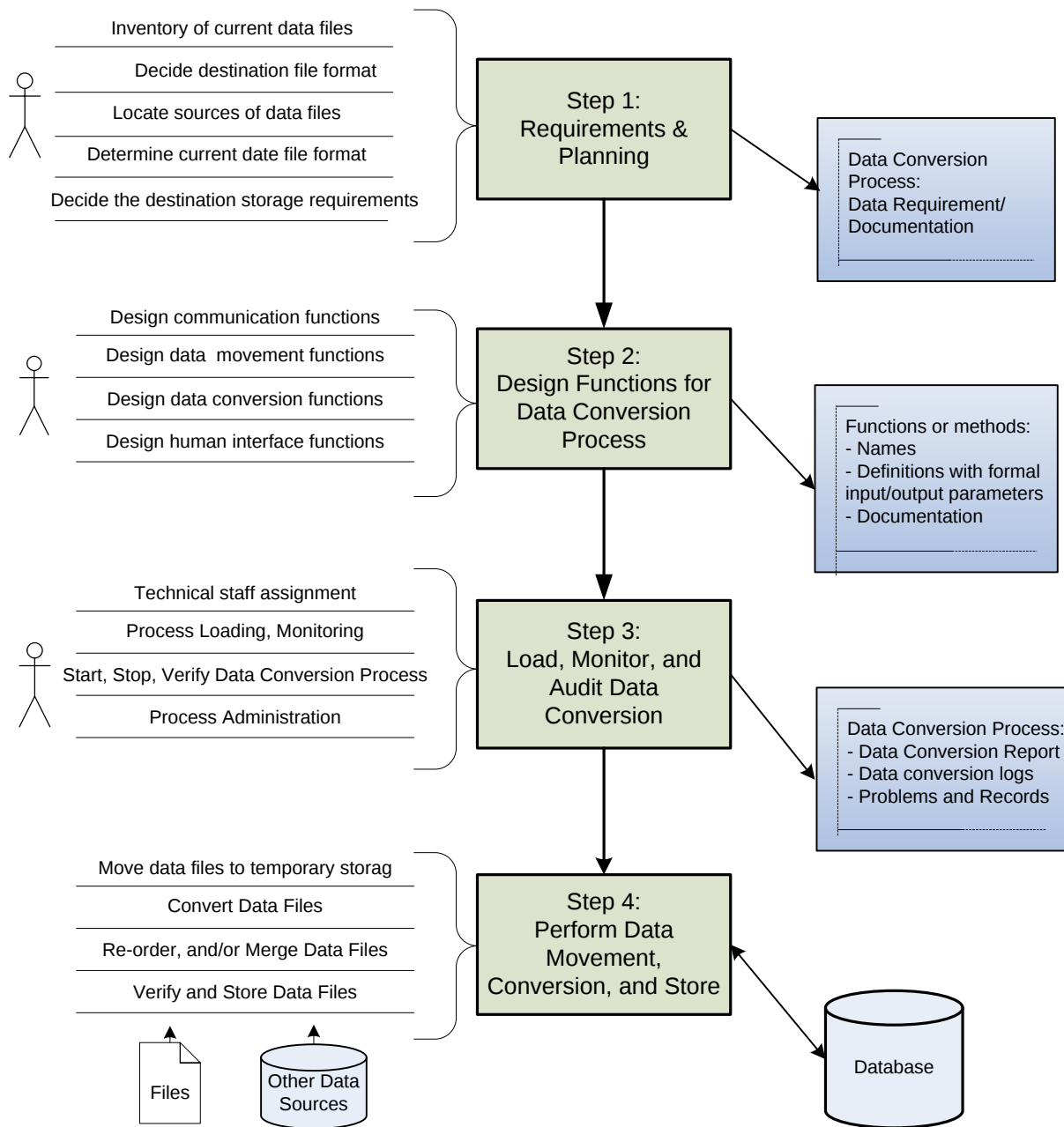


Mobile Sales Automation System



Mobile Sales Automation System: Order System – Level 1 Diagram for Manage Order Process

Data Conversion Workflow

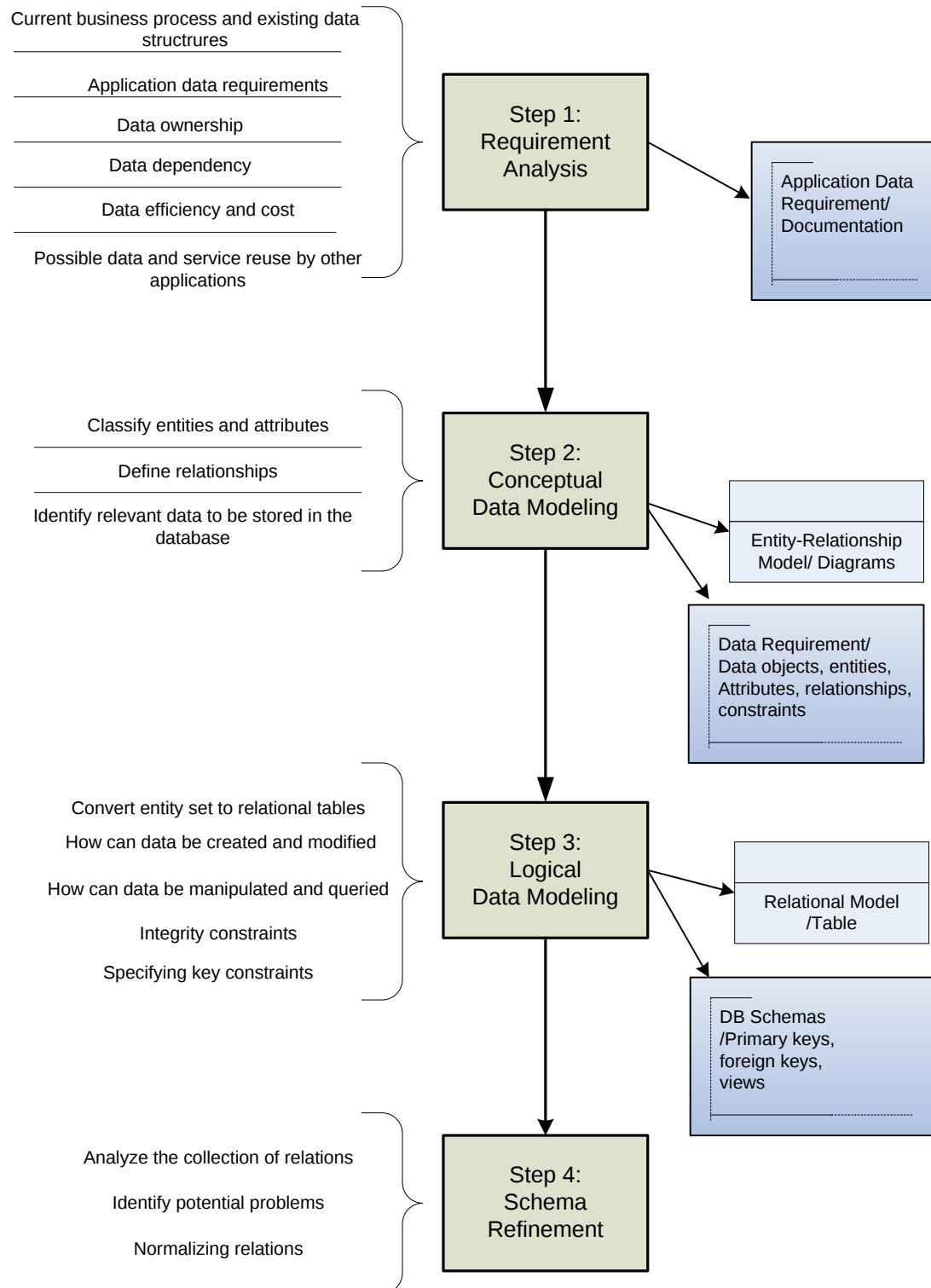


Workflow for Data Conversion

Data Analysis, Modeling and Design (Web-based System)

- **Data Input, Process, Store & Display**
 - Forms, Reports, Screen of data
- **Data Modeling Workflow**
- **Logical Data Structure**
 - Graphical Data Model
- **Database Schema**
 - A model of the structure of a database
 - Describe the kinds of data as realized in specific implementation model, such as the relational model or the object-oriented model
- **Physical Data Storage**
- **Business Data Processing**
 - Data => Information
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- **Users**
- **Documentation**

Data Modeling Workflow – for Database Design & Application



Workflow for Data Modeling

Step 1. Requirement Analysis

- **Inputs:**
 - Current business process & existing data structures
 - Application data requirements
 - Data ownership
 - Data dependency
 - Data efficiency and cost
 - Possible data and service reuse by other applications
- **Outputs:**
 - Application data requirement
 - Documentation

Step 2. Conceptual Data Modeling

- **Inputs:**
 - Classify entities and attributes
 - Defines relationships
 - Identify relevant data to be stored in the database
- **Outputs:**
 - Entity-Relationship Models/Diagrams
 - Data Requirements
 - Data objects, entities, attributes, relationships, constraints

Step 3. Logical Data Modeling

- **Inputs:**
 - Convert entity set to relation tables
 - How can data be created and modified
 - How can data be manipulated and queried
 - Integrity constraints
 - Specifying key constraints
- **Outputs:**
 - Relational Model/Table
 - DB Schema/Primary keys, foreign keys, views

Step 4. Schema Refinements

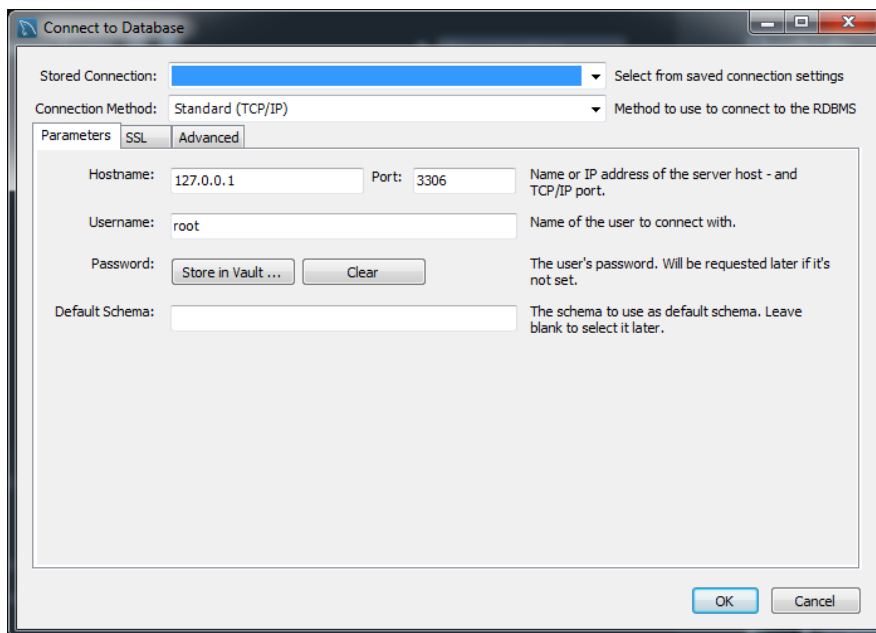
- **Inputs:**
 - Analyze the collection of relations
 - Identify potential problems
 - Normalizing relations
- **Outputs**

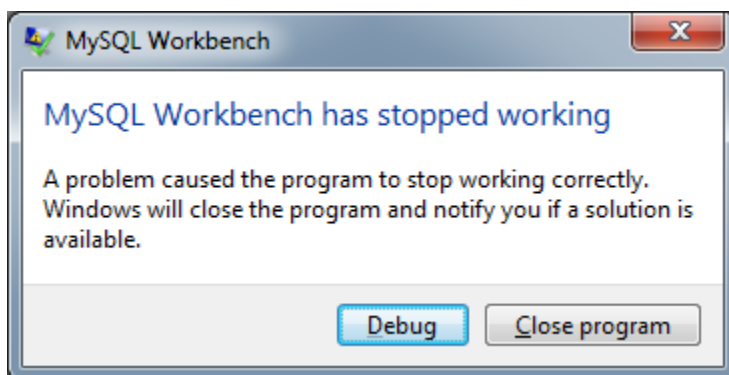
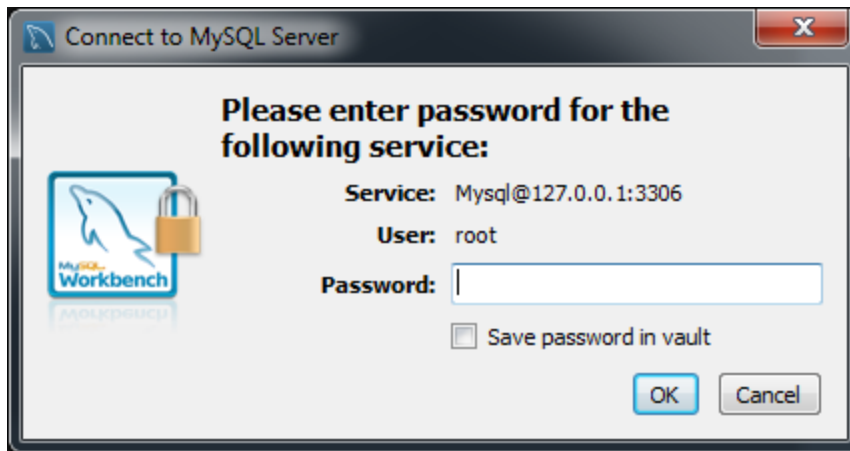
Logical Data Structure (LDS)

- Vocabulary of LDS
 - Entity
 - Attribute
 - Relationship: one-to-one, one-to-many, many-to-one, many-to-many
 - Link
 - Descriptor
 - Maximum degree
 - Identifier
- Entity
 - Represented by a box
 - Examples – a COW entity with 5 attributes
 - COW for RFID Tracking
 - Cow ID
 - Name
 - Birth Place
 - Birth Weight
 - Current Weight
 - Instances

Cow ID	Name	Birth Place	Birth Weight	Current Weight
1254	Manly Bully	Ft Wayne	30	480
1289	Funny Daisy	New Haven	35	500

MySQL Workbench





<http://www.mandsconsulting.com/resolving-mysql-workbench-has-stopped-working-error-message-workbench-v5-2-windows-event-id-1026-and-1000>

Ch. 11 Managing MySQL Database

Case Study Schemas

- Figure 11.23 Art Database Schema, p. 477
- Figure 11.24 Book CRM Database Schema, p. 478
- Figure 11.25 Travel Photo Database Schema, p. 478

Art database tables

- ArtWorks
- Artists
- OrderDetails
- Reviews
- ArtWorkKeyWords
- Keywords
- ArtWorkSubjects
- Subjects
- Customers
- Orders
- CustomerLogon

- OrderDetails
- TypesFrames
- TypesMatt
- TypesGlass

Book CRM database tables

- Books
- Imprints
- BindingTypes
- Subcategories
- ProductionStatuses
- BookAuthors
- Authors
- CustomerBooks
- Customers

Travel Photo Sharing Database Tables

- GeoCounty
- GeoCities
- GeoTimeZones
- GeoContents
- TravellImageDetails
- TravelUser
- TravellImage
- TravelPost
- TravelerUserFollowing
- TravellImageLocations
- TravellImageRating
- TravelPostingImages

Simple Database Techniques