

# Data Modelling

## 1. Introduction to Logical Data Modeling

- Importance of logical data modeling in requirements
- When to use logical data models
- Relationship between logical and physical data model
- Elements of a logical data model
- Read a high-level data model
- Data model prerequisites
- Data model sources of information
- Developing a logical data model

## 2. Project Context and Drivers

- Importance of well-defined solution scope
- Functional decomposition diagram
- Context-level data flow diagram
- Sources of requirements
  - Functional decomposition diagrams
  - Data flow diagrams
  - Use case models
  - Workflow models
  - Business rules
  - State diagrams
  - Class diagrams
  - Other documentation
- Types of modeling projects
  - Transactional business systems
  - Business intelligence and data warehousing systems
  - Integration and consolidation of existing systems
  - Maintenance of existing systems
  - Enterprise analysis

- Commercial off-the-shelf application

### **3. Conceptual Data Modeling**

- Discovering entities
- Defining entities
- Documenting an entity
- Identifying attributes
- Distinguishing between entities and attributes

### **4. Conceptual Data Modeling-Identifying Relationships and Business Rules**

- Model fundamental relationships
- Cardinality of relationships
  - One-to-one
  - One-to-many
  - Many-to-many
- Is the relationship mandatory or optional?
- Naming the relationships

### **5. Identifying Attributes**

- Discover attributes for the subject area
- Assign attributes to the appropriate entity
- Name attributes using established naming conventions
- Documenting attributes

### **6. Advanced Relationships**

- Modeling many-to-many relationships
- Model multiple relationships between the same two entities
- Model self-referencing relationships
- Model ternary relationships
- Identify redundant relationships

### **7. Completing the Logical Data Model**

- Use supertypes and subtypes to manage complexity
- Use supertypes and subtypes to represent rules and constraints

### **8. Data Integrity Through Normalization**

- Normalize a logical data model

- First normal form
- Second normal form
- Third normal form
- Reasons for denormalization
- Transactional vs. business intelligence applications

## **9. Verification and Validation**

- Verify the technical accuracy of a logical data model
- Use CASE tools to assist in verification
- Verify the logical data model using other models
  - Data flow diagram
  - CRUD matrix