Data Flow Diagrams

UML Diagram Types

Dynamic Models
- activity diagrams
- statechart diagrams
- interaction diagrams
  - sequence diagrams
  - collaboration diagrams
- use case diagrams

Structural Models
- class diagrams
- object diagrams
- packages

Architectural Models
- component diagrams
- deployment diagrams

Object Modeling Technique

Object Model
- Class/Object Diagrams

Dynamic Model
- State Diagram

Functional Model
- Data Flow Diagram
Elements of a DFD

Process
def'n: part of a DFD that transforms data values
- shows possible functional paths
- does not show control information
- does not show/imply sequence of operations
- processes may be expanded
- Convention: oval with name

Actor
def'n: producer of consumer of data
- shows boundary of system
- Convention: rectangle with name

Data Store
def'n: passive object within data flow diagram that stores data for later access
- shows temporary/permanent storage
- allows values to be accessed in different order than generated
- can be aggregate (tables, arrays)
- Convention: two parallel lines with name
Relationships of a DFD

**Data Flow**

**def'n:** connects the output of an object or process to the input of another object or process
- shows interim data flow in computation
- can have composition, duplication, decomposition
- Convention: directed arc with name

Similarity to UML Diagrams

**Use Case Diagram**
- because DFD shows system border

**Collaboration Diagram**
- because DFD shows message passing between objects

**Deployment Diagram**
- because data stores imply some form of storage device

To Draw Data Flow Diagrams

- Determine all data needed by system
- Determine what system produces
- Determine producers of bullet 1 and consumers of bullet 2
- Determine overall process name and content
- Expand overall system process
- If elemental, then done
- If not elemental, then iterate
Dataflow Diagram: Summary

- Part of UML predecessor, called Object Modeling Technique (OMT), by Rumbaugh
- Frequentely used in non-OO languages
- Comprised of:
  - processes;
  - actors;
  - datastores;
  - dataflows