**Requirements and Specification, ESOF 328, Spring 2020**
**"A picture is Worth 1024 Words" (Chapter 12), Feb. 14**

An early goal of structured systems analysis was to replace the classical functional specification with diagrams and notations that are more formal than narrative text.

Don't invent your own modeling notations, use standardized ones.

Modeling can be used for:

- Analysis – concepts
- Design – what you intend to build

Relate the models to each other:

- DFD help identify missing entities in ERDs
- Processes in a DFD are good candidates for swimlane diagrams
- Class diagrams show structure of software, object diagrams show a snapshot in time (these are UML diagrams)

Table 12-2 (pages 225-226) is very useful for determining what diagram to use.

When creating diagrams place a textbox near the top that overviews what the diagram represents in the given context. (This may be removed when the diagram goes into the document.)

Recall that Chapter 5:"Establishing the business requirements", discussed

- Context diagram
- Ecosystem map
- Feature tree

DFD – useful for batch systems; less useful for event-driven systems

- Circles – processes
- Arrows – data flow
- Parallel lines – data store
- Rectangles – external entities

Swimlane diagrams – show steps in a business process, emphasizing who does what (like UML activity diagrams)

- Lanes – for different systems or actors
- Rectangles or rounded rectangles – process steps
- Arrows – transitions between process steps
- Diamonds – decisions
- Bars
    - One arrow going in - do in parallel
    - Multiple arrows going in – wait, to synchronize

State-transition diagrams (in UML sometimes called state charts)

- Rectangles – states
- Arrows – transitions from one state to another
- Text on arrows – events that cause the transitions

Same information can be represented in a table.

Dialog map – user interface design

- Rectangles – dialog elements (screens with no detail)
- Arrows – navigation between dialog elements
- Text on arrows – user action to cause the navigation

Decision tables or trees – for complex logic

Event-response tables – for real time systems. Include:

- Events: Business event, signal event or temporal event
- State
- System response

UML, typically for design, but certain models can be helpful.

Agile systems (and all systems) – focus on creating only the models you need, only when you need them, and only to the level of detail you need to make sure project stakeholders adequately understand the requirements.