Like state diagrams, activity diagrams describe activities which involve concurrency and synchronization.

Activity diagrams focus on the flow of actions and events.

Can be used
- To model a human task (e.g., a business process).
- To describe a system function represented by a use case.
- To describe the logic of an operation.
Petri Nets

Petri nets generalize state diagrams by allowing transitions which involve several input and output states:

An Example
Order Processing

Receive Order

- for each line item on order
- [failed]

Authorize Payment

- [in stock]
- [succeeded]

Check Line Item

- [stock assigned to all line items and payment authorized]
- [need to reorder]

Cancel Order

Assign to Order

Dispatch Order

Reorder Item

Decision Points

- Decision points:
  - Calculate total cost
  - [cost<$50]
  - Charge customer’s account
  - [cost≥$50]
  - Get authorization

- Dead ends: there may be transitions in an activity diagram with no destination state; this can mean that:
  - Not all processing has been specified;
  - Or, that another activity diagram will take over.
**Swimlanes**

**Finance**
- Receive Order
- Authorize Payment
- Cancel Order
- Dispatch Order

**Order Processing**
- Reorder Item
- Check Line Item
- Assign to Order
- Assign Goods to Order
- Check Line Item *for each chosen order item
- Choose Outstanding Order Items
- Stock Manager
- Receive Supply
- Add Remainder to Stock

**Stock Manager**
- Receive Supply

*In stock* *for each line item on order
*in stock* *for each chosen order item
[stock assigned to all line items and payment authorized]
[stock assigned to all line items and payment authorized]
[need to reorder] [order items filled]

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**When to Use What?**

- **State diagrams** are good for modeling the lifetime of an object or actor, also for modeling user interfaces and business processes which involve many states.
- **Activity diagrams** are good for modeling business processes and system processes **that involve a lot of concurrency**.
- **Sequence and collaboration diagrams** are useful for modeling interactions; **several of them** can be used to model dialogue structure for a user interface, or a business process.
Additional Readings