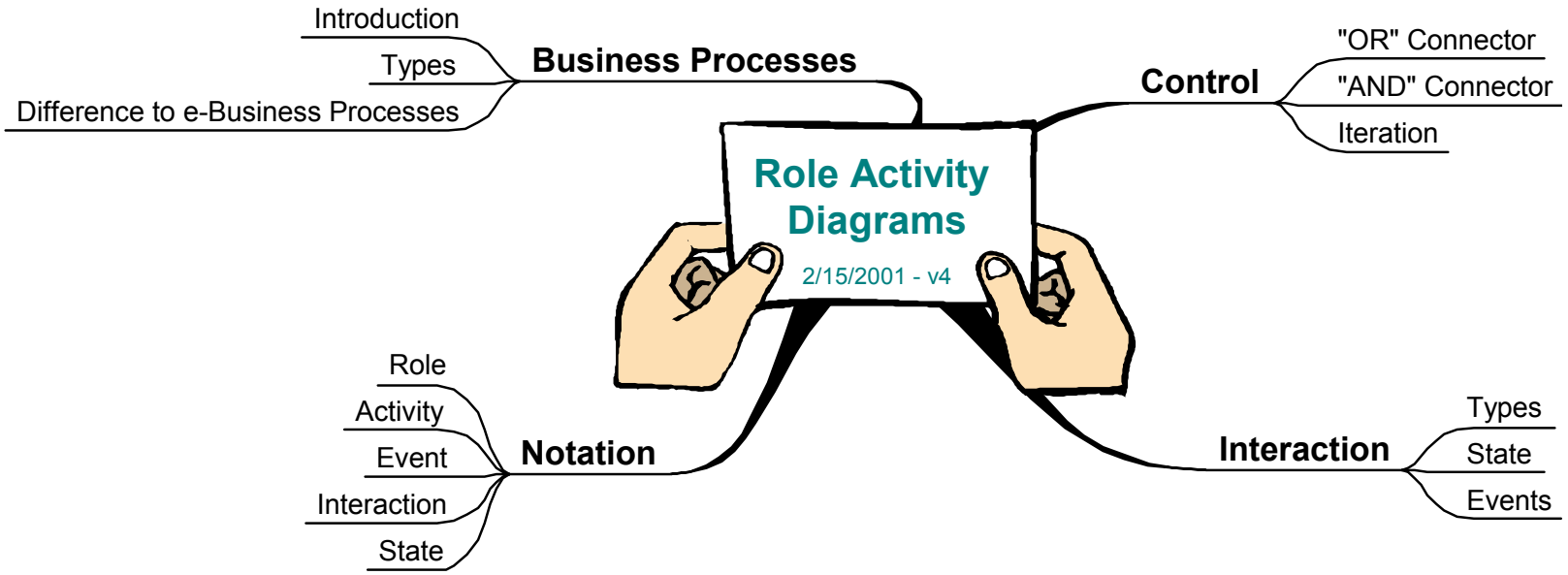
Role Activity Diagrams

-- Introduction / Examples –

Outline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Difference to e-Business Processes
Business Processes
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"OR" Connector
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Role Activity Diagrams
2/15/2001 - v4
Role
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Event
Interaction
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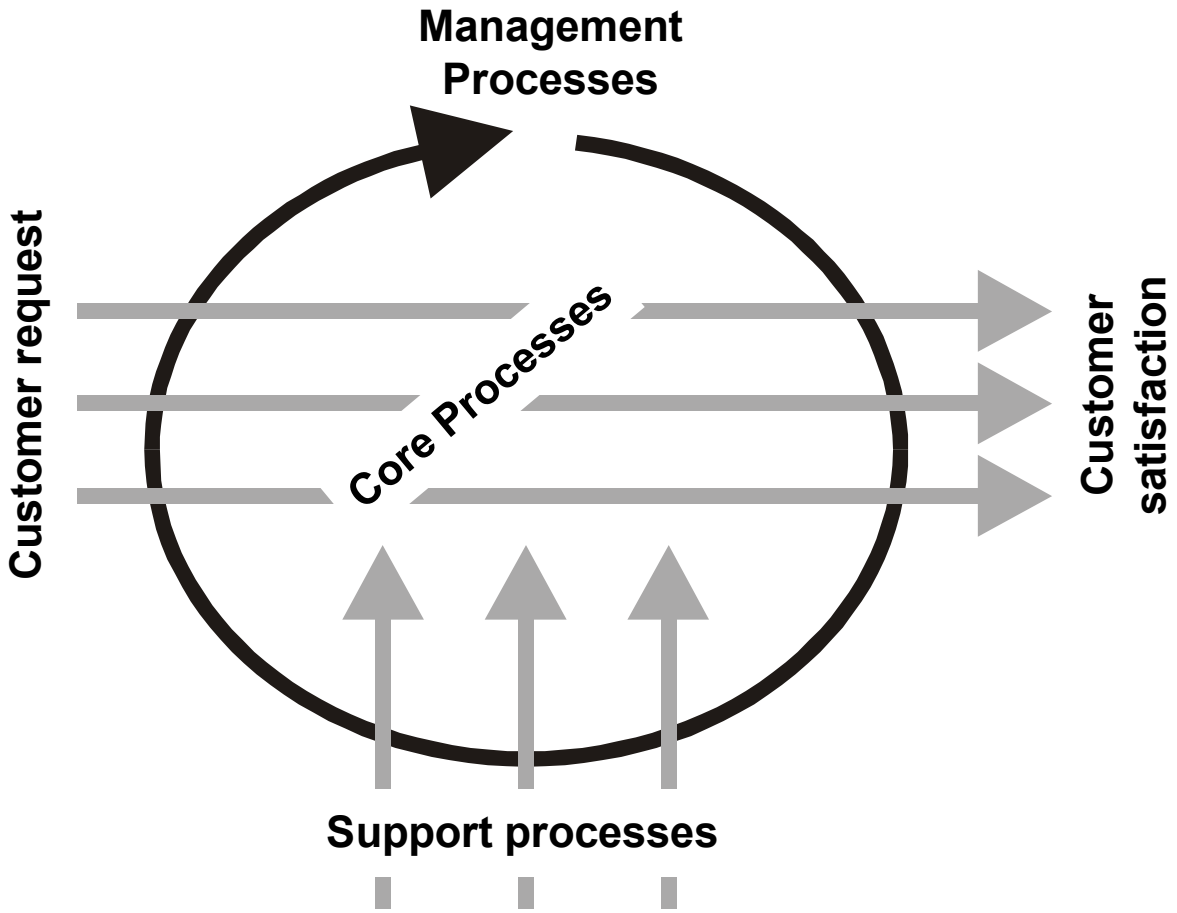
Interaction
Types
State
Events

Introduction

- Original paper Ould & Roberts (1986)
- Formal semantics. Similar to Petri Nets. Can be mapped to other formal notations
- Widely used. Promoted by Praxis (Ould, Huckvale & others) & Coordination Systems (Roberts)
- Applied to a number of domains, e.g., Software Engineering, finance, Retail and Construction

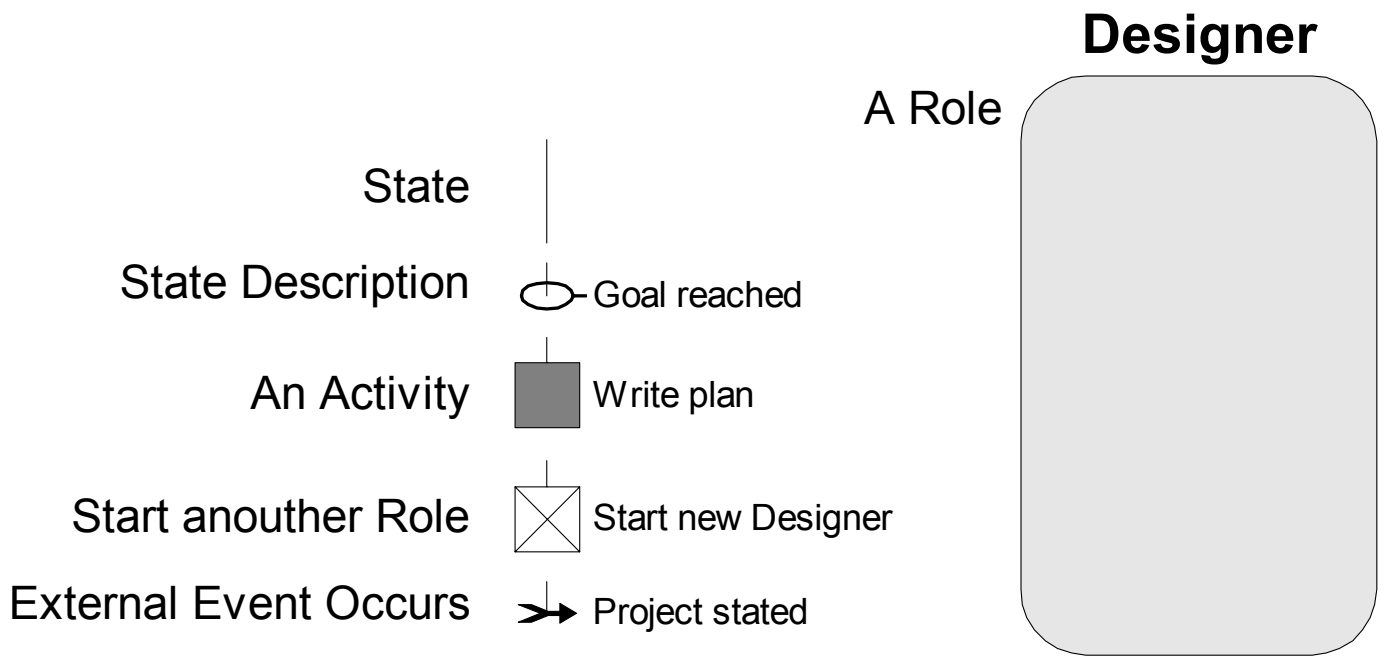
3 Types of Processes



Important Business Process Constructs

- Interactions?
- Parallel / concurrent threads?
- Choices?
- Iteration?

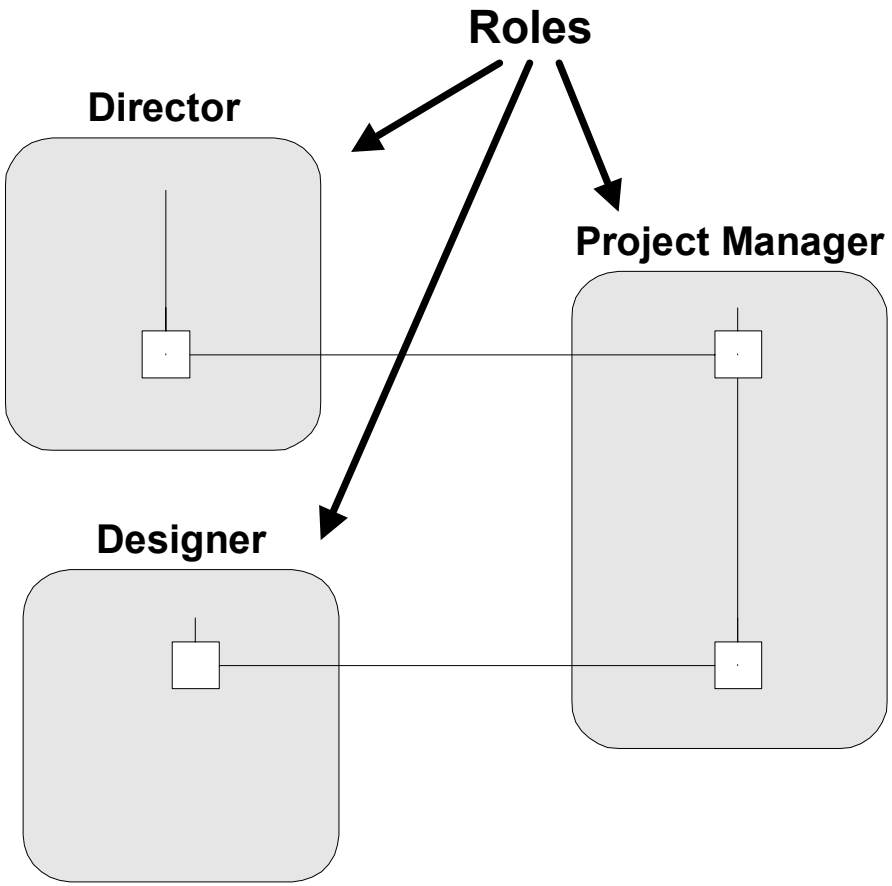
RAD Notation



Roles and RADs

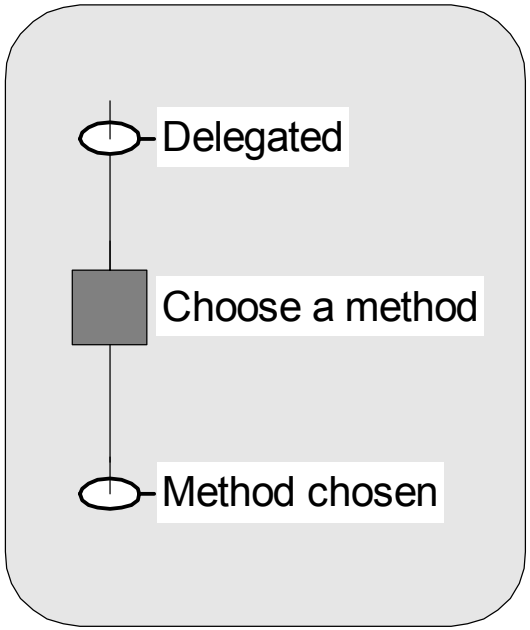
- Business depicted in terms of roles
- Roles are types - e.g., they describe the behaviour of a class of individuals
- A Role is independent of other roles, but communicates through interactions
- Instances of roles therefore act in parallel, with the interaction between roles being their only synchronisation mechanism

Basics: Role Activity Diagram (RAD)

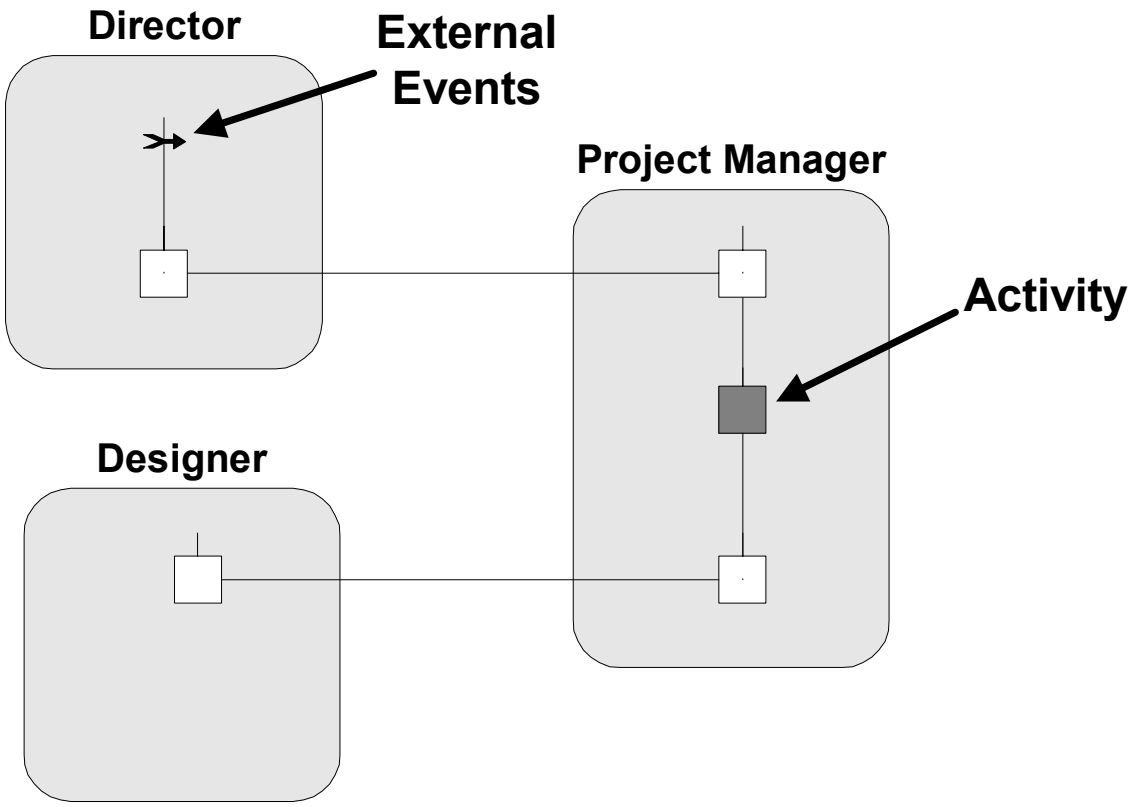


Role Behavior: Actions

- An action is an activity which the role carries out in isolation
- Carrying out an action moves the role from its present state to the next state



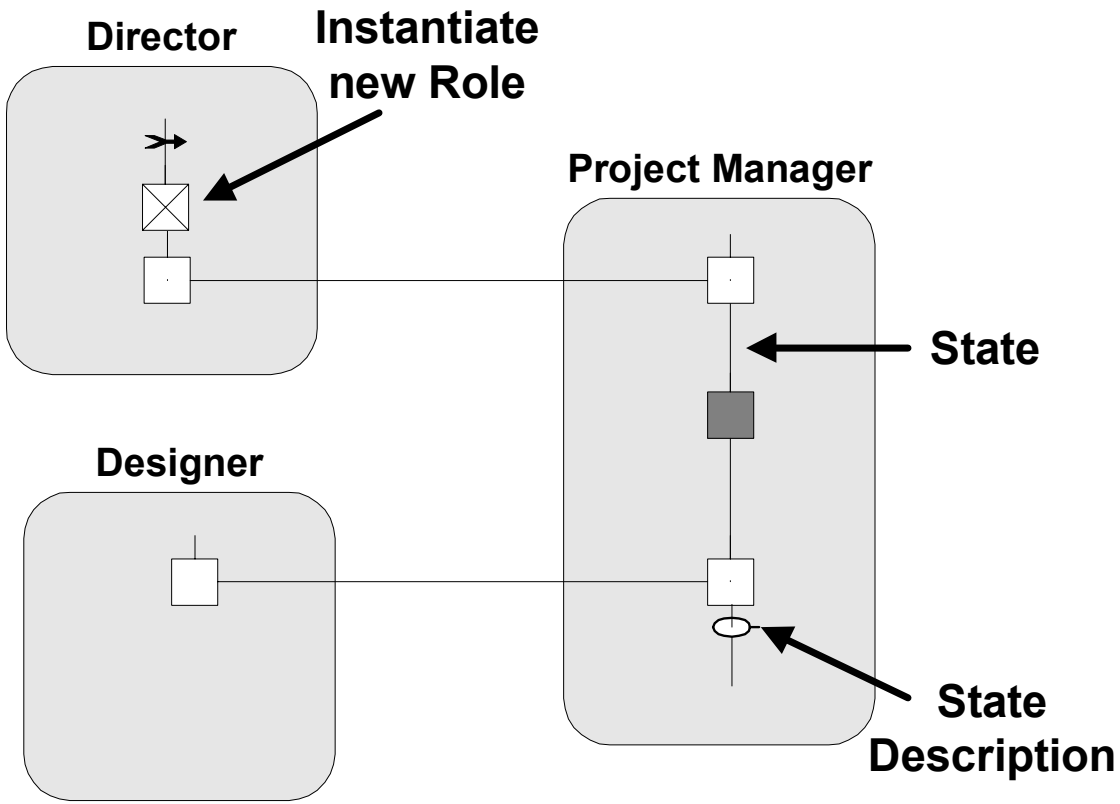
Basics: Role Activity Diagram (RAD)



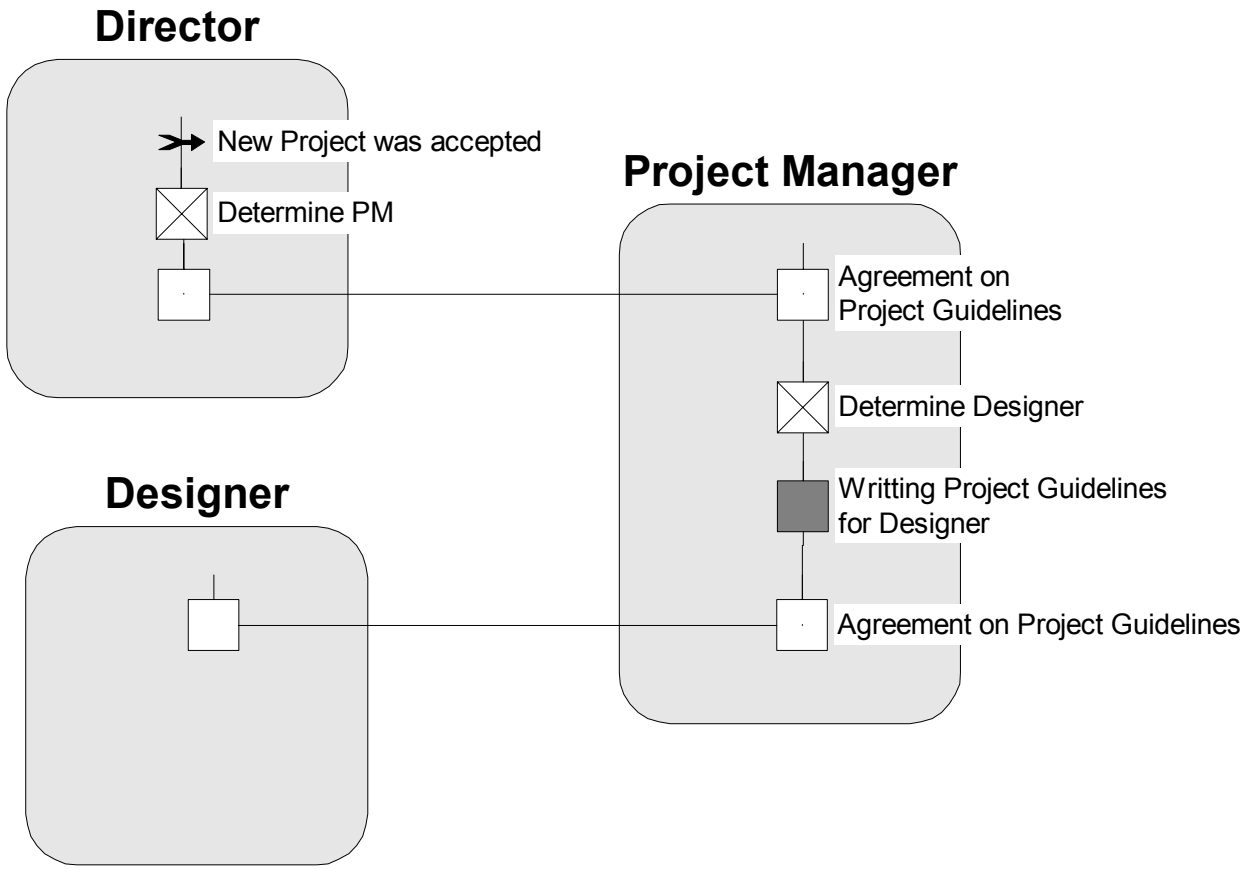
Roles have State

- **Not required to explicitly label the states of a role, though some authors prefer to do so.**
- **Labeling states (with circles or ellipses) helps the semantics of the role become clearer**
  - Labels make explicit the pre-conditions, pre-actions and consequences (post-conditions) of each activity.
  - Sometimes need to separate parallel threads into separate (or main and sub) roles…
- **Diagram becomes larger and this may hamper understanding**

Basics: Role Activity Diagram (RAD)



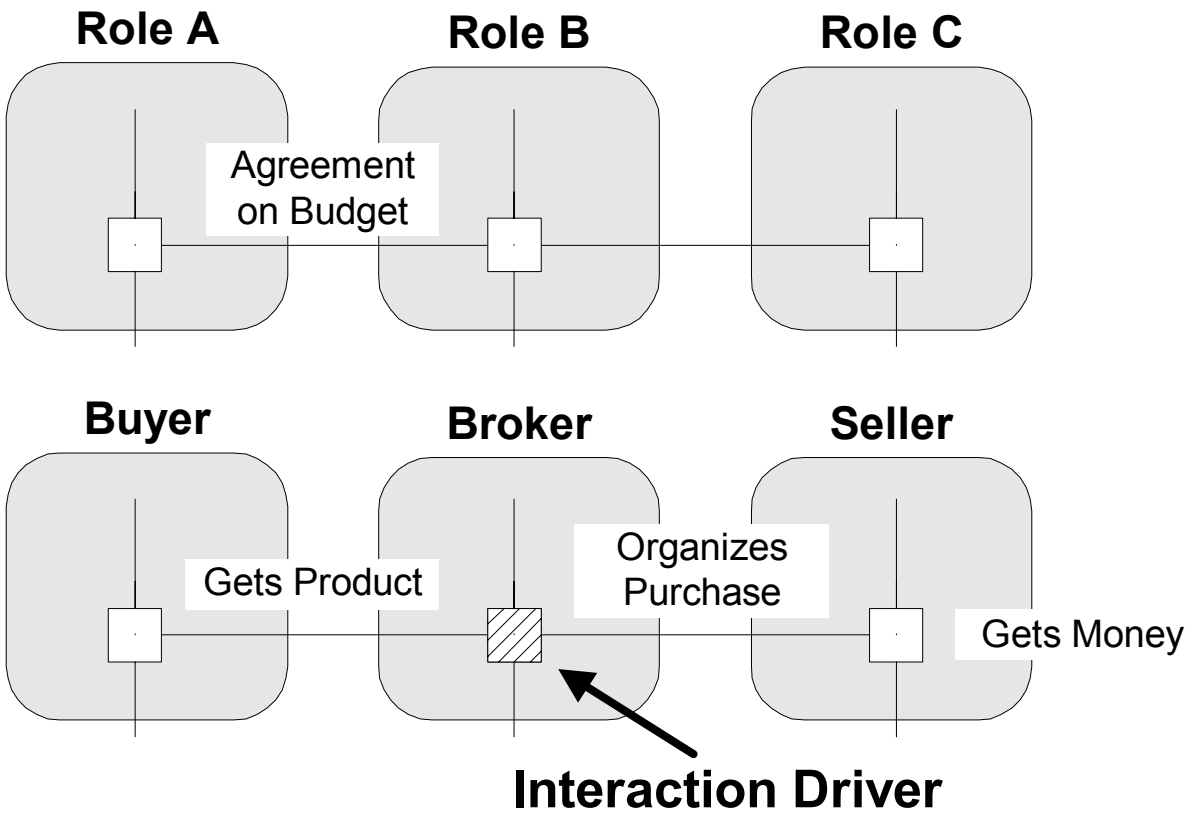
Example: Design Project



Behavior: Interactions

- An activity carried out at the same point as another activity (or other activities) in another role (or roles). A shared event.
- The consequence of an interaction is that all of the roles involved move from their current state to their next state.
- Interaction must be initiated by some (driving) role.
- Interactions are synchronous

Interactions

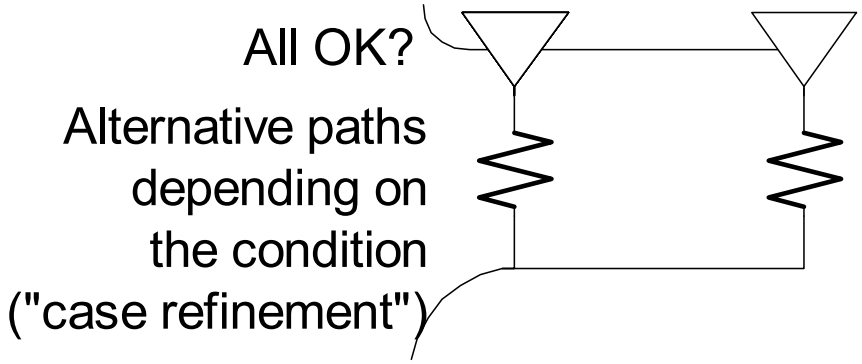


Control

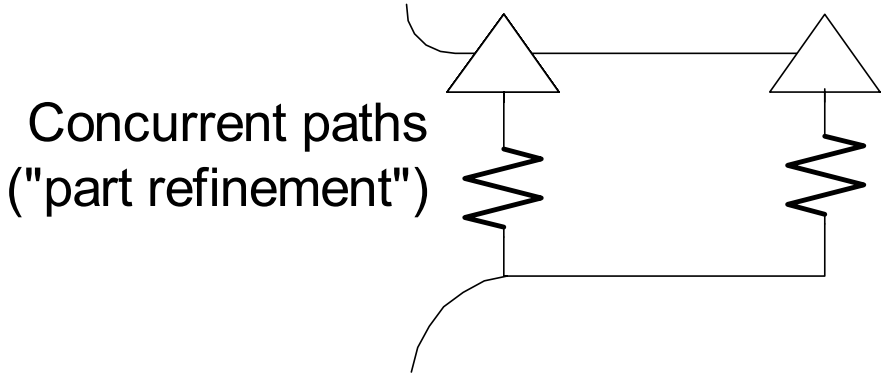
- Thread of control in a role need not proceed sequentially
- Choice or case-refinement. There may be any number of alternative threads but only one of the threads (or cases) may be chosen
- Concurrent threads or part-refinement. Each thread represents part of the path. The threads all join together again after the split denoting that all paths have been completed

RAD: Control

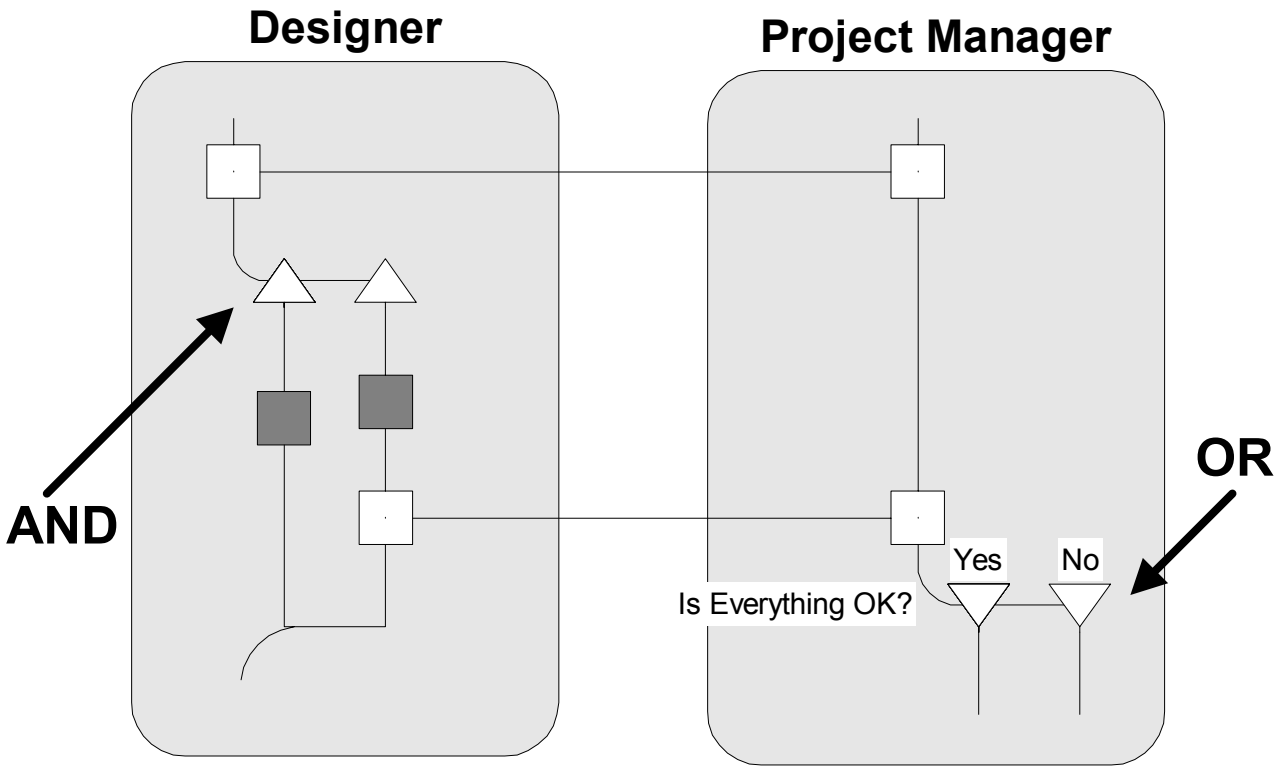
- Alternative Paths, Case Refinement



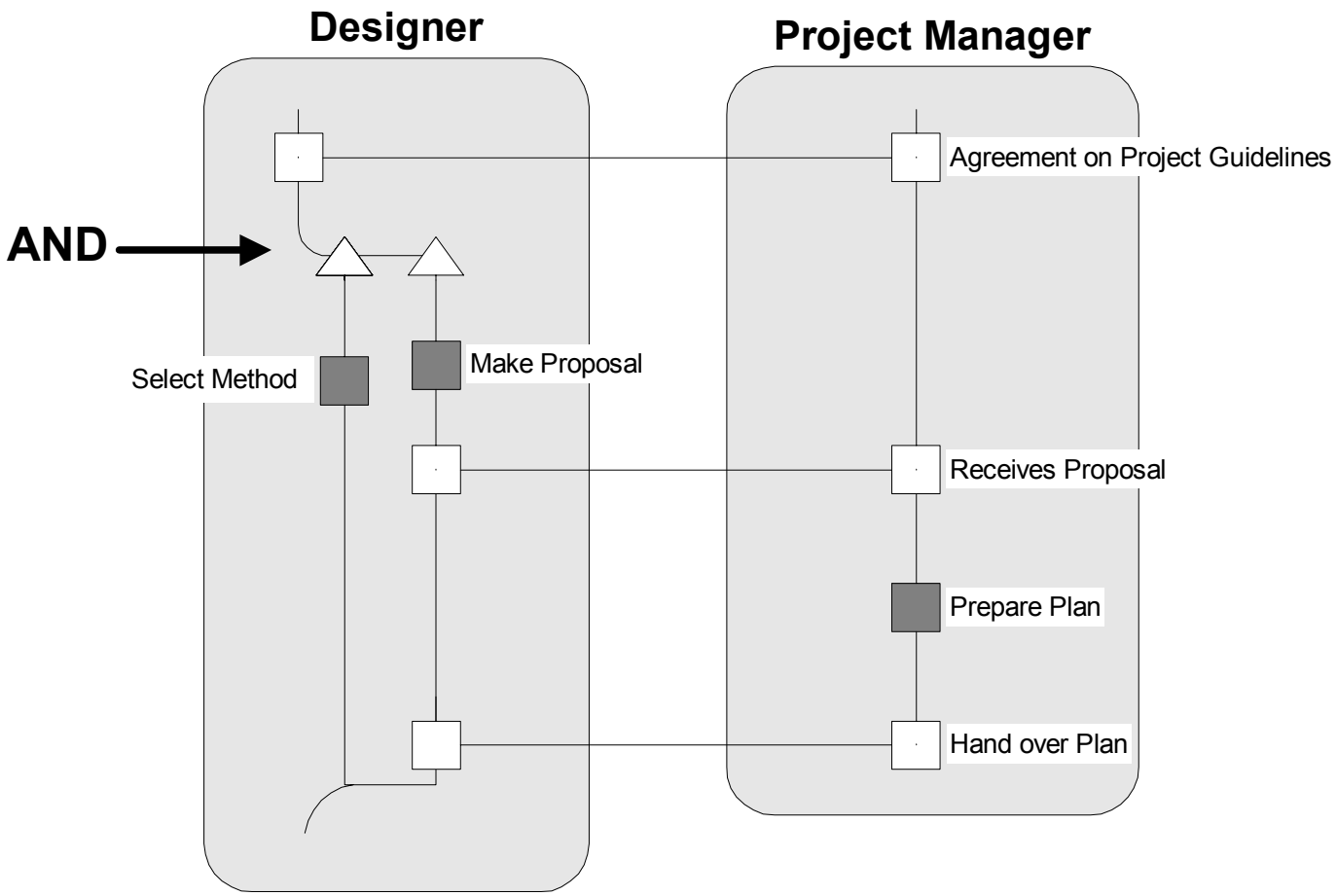
- Concurrent paths, Part Refinement



“AND” & “OR” Connectors



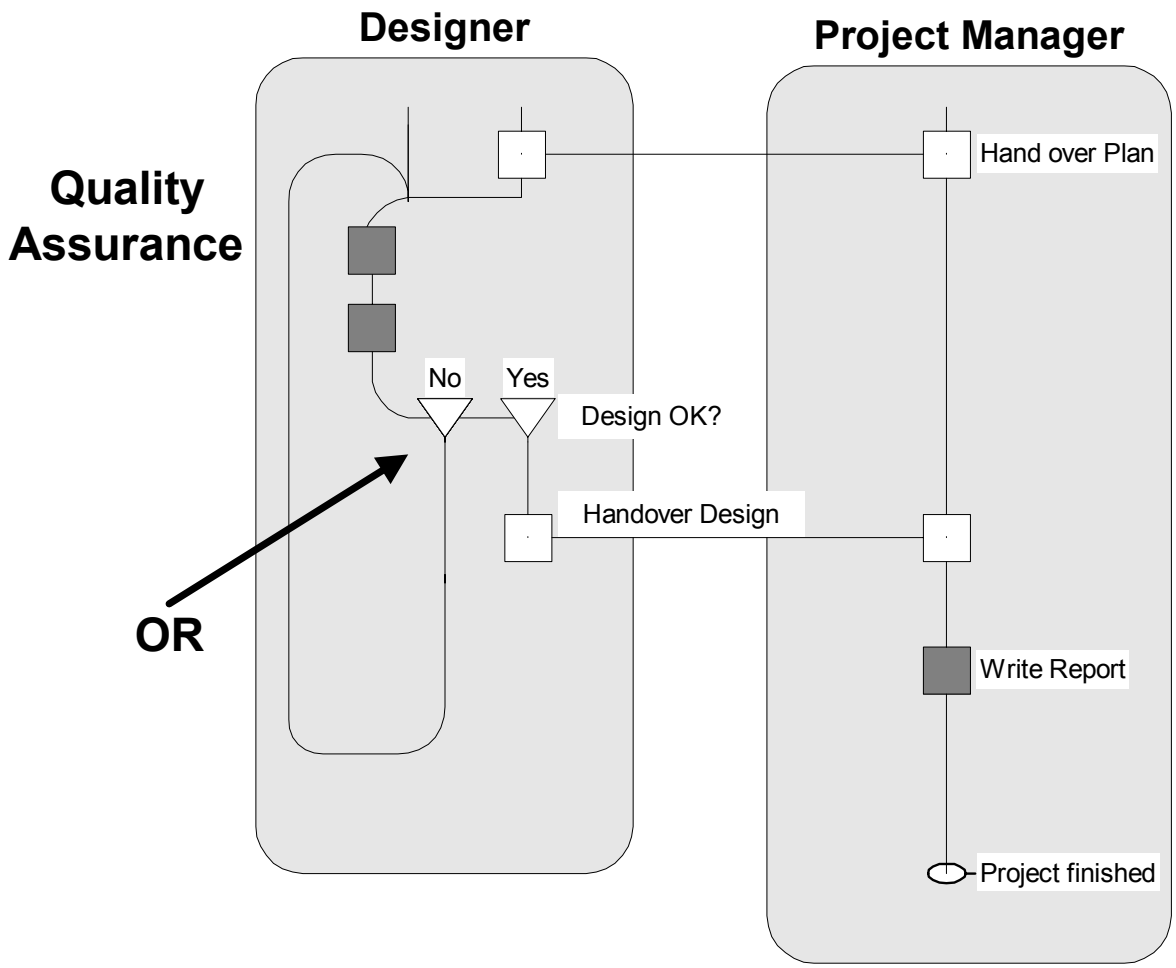
Example: Design Project



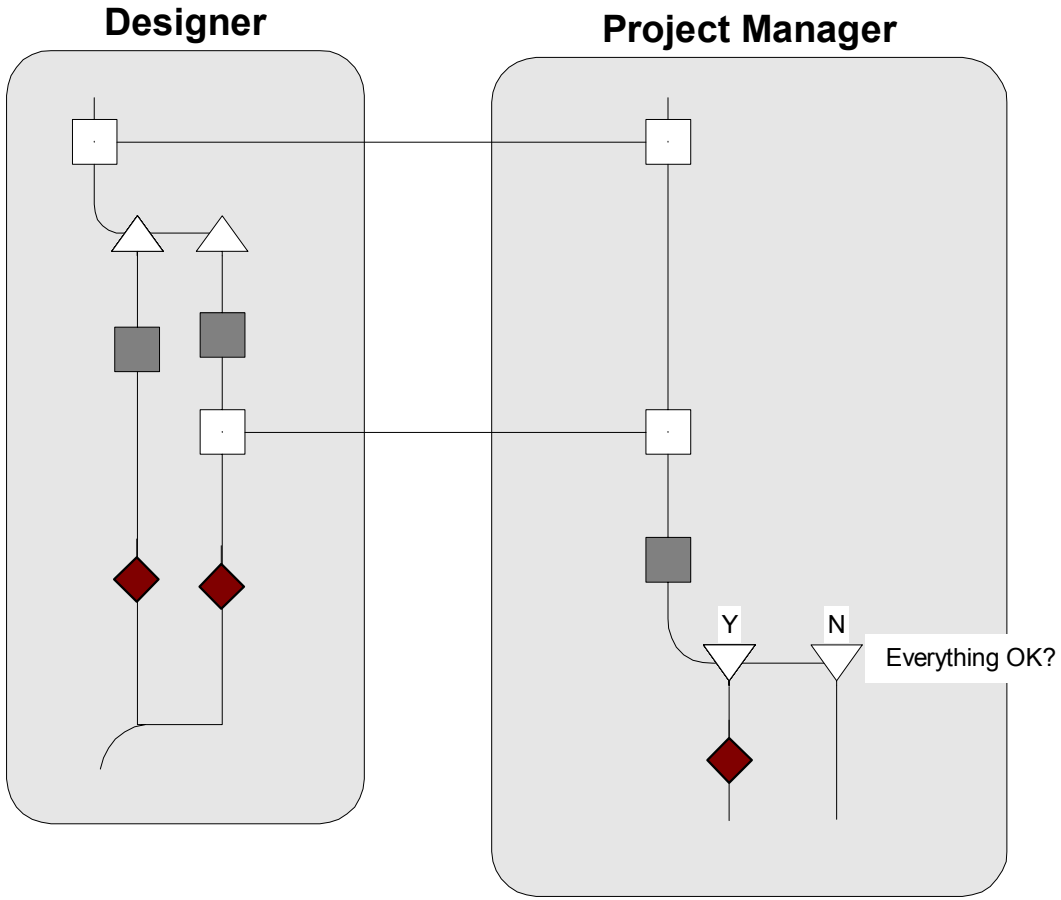
Iteration

- **Iteration is where a state may be revisited. Shown by:**
  - Drawing a loop back to a previous point on the role.
  - Having the post-state of an action as a previously named state.
- **Typically used when there is some checking or control mechanism to be modeled**

Example: Design Project



“TOKENS”



RAD Literature

- **Martyn A. Ould:** Business Processes: Modeling and Analysis for Re-engineering and Improvement
- **RAD Visio Stencils**: http://www.the-old-school.demon.co.uk/veniceresources.htm