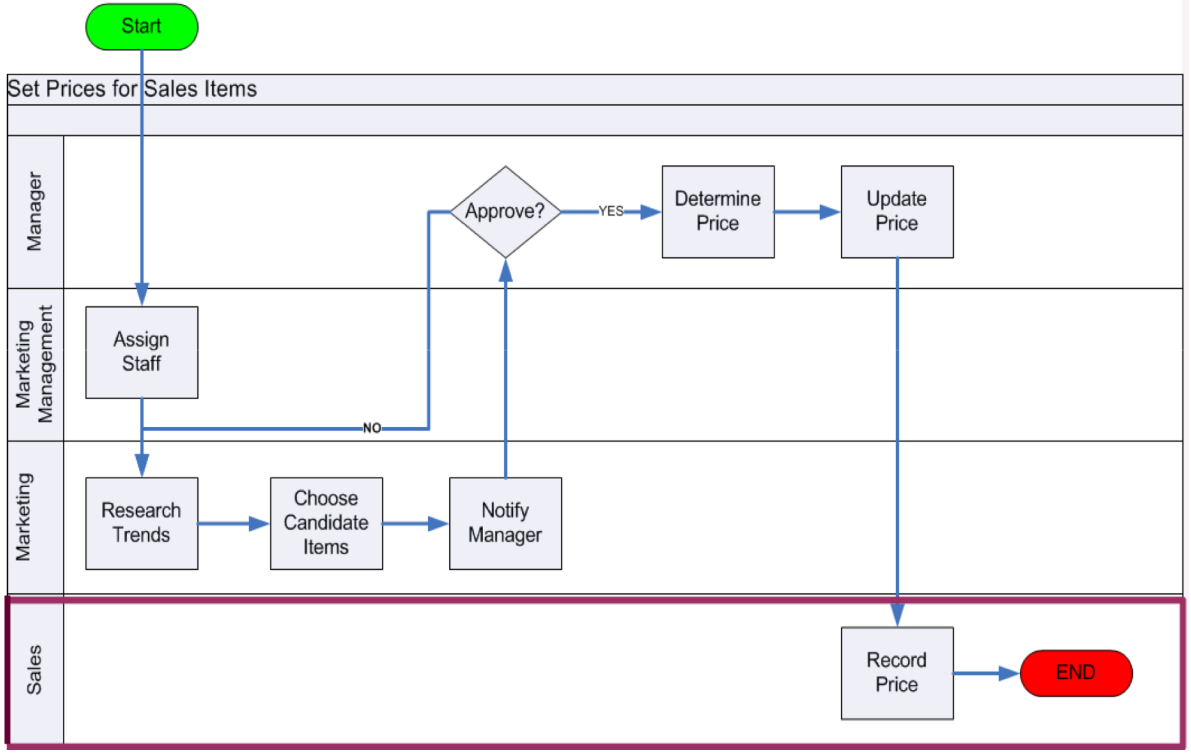
Activity Diagrams

CSCI-4448 - Boese

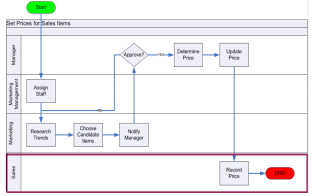
University of Colorado **Boulder**

Overview

Activity Diagrams



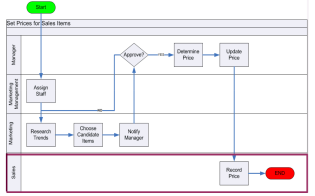
Activity Diagrams - Definition



Activity Diagrams

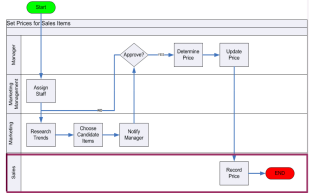
- A.k.a. Business Process Mapping (or Modeling)
- Defining ***current-state*** and ***future-state*** business processes
- Show business **workflow** in response to a business event
- Show the interactions between people and organizations.

Activity Diagrams - Why



- Why?
  - Primary: Identify opportunities for business improvement and optimize business processes.
    A key tool for Six Sigma and Lean approaches for business process improvement
  - Secondary:
    Illustrate interactions between people and systems
  - Helps determine scope
  - Most people “get-it”. Easy to follow.
  - Helps for getting group consensus on what does happen or what should happen

Activity Diagrams – When Use

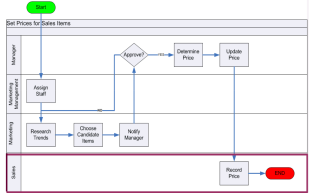


When should you use Activity Diagrams?

- Does your project have all of these characteristics?
  - The boundary includes direct interactions between people and optionally includes one or more systems,
  - Scope issues
    - *Stakeholders' understandings*
    - *The sequence in which activities occur is very important to scoping discussions right from the start of the project.*
  - Teams
    - *"Picture-thinkers"*
    - *Projects using Six-Sigma, Lean or other business modeling methodologies*

Details

Activity Diagrams

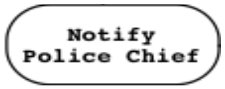


Activity Diagrams

- Represent the business processes, current and future states.
- Main Components
  - **Swim lanes** with the actors

  - **Initial Node**

  - **Final Node**

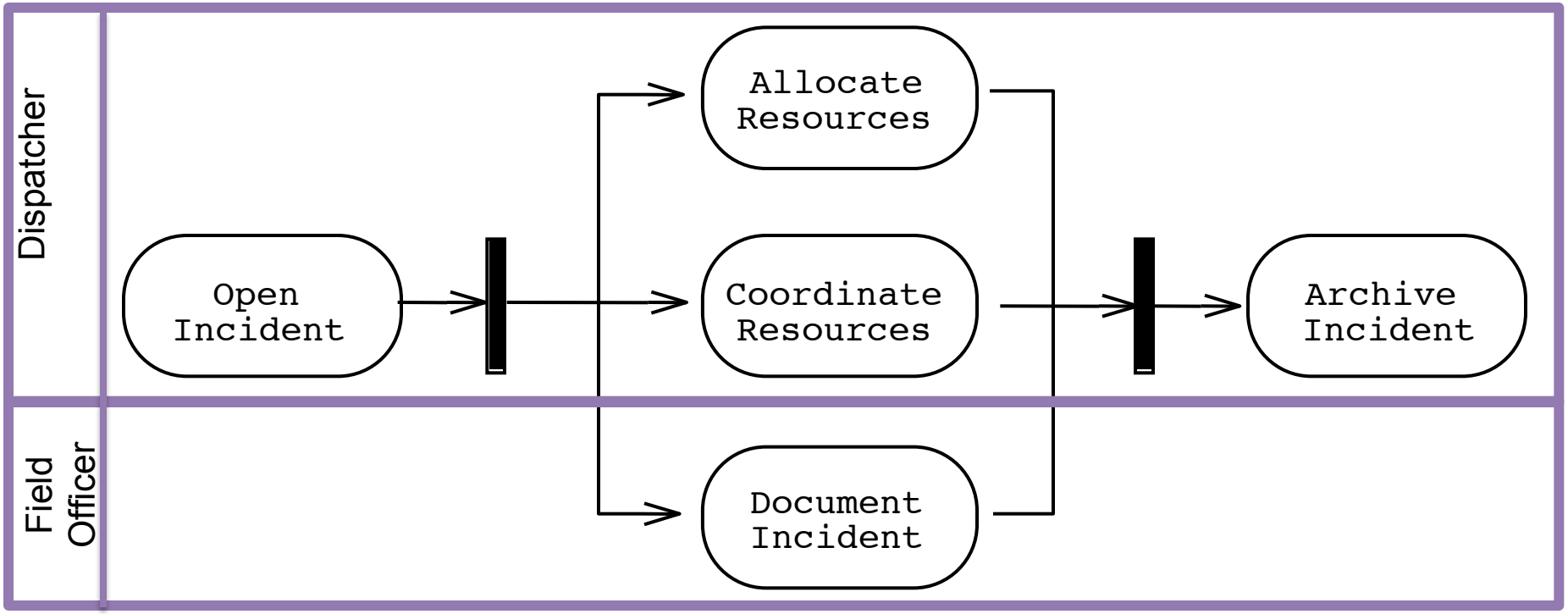
  - **Early Termination Node**
  - **Activity**: *Rectangle (could have rounded edges)* 

  - **Flow**: *Directed lines*

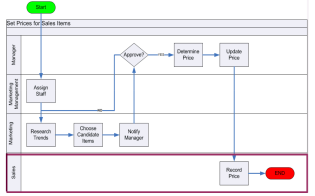
  - **Fork/Join**: *Dotted box around activities that happen in parallel and bar to split/join flow*
  - **Decision/Merge**: *Diamonds w/ conditional logic.*

Activity Diagrams: Grouping of Activities

- Activities grouped into **swim-lanes** to denote the object or subsystem that implements the activities.



Activity Diagrams - Components

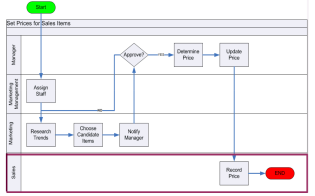


- **Activity**
  - Verb - Noun
  - An action by a system or by a user.
  - E.g.,
    - *Determine Price*
    - *Research Trends*
    - *Assign Staff*
    - *Update Profile*
    - *Create New User*

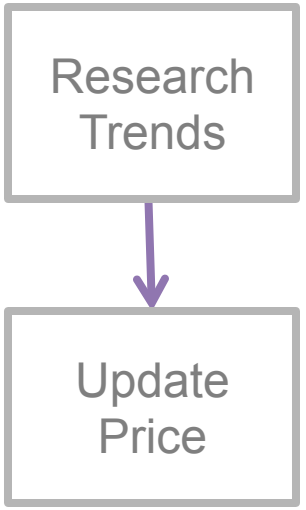
Research Trends

Update Price

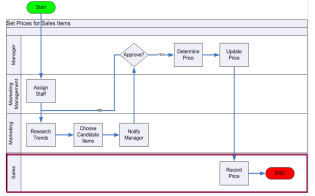
Activity Diagrams - Components



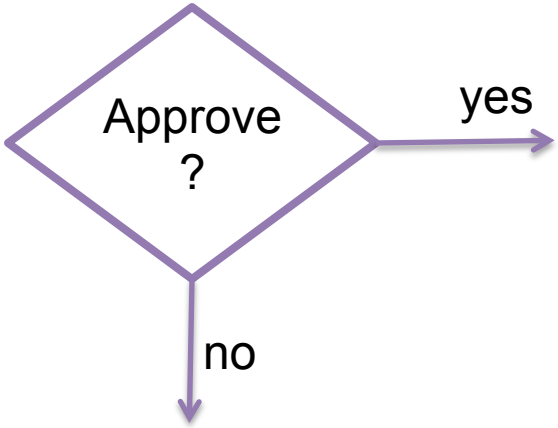
- **Flow**
  - Directed lines
  - Lines between activities and/or other constructs.
  - Flows can be annotated with guards “[student on list]” that restrict its use .



Activity Diagrams - Components

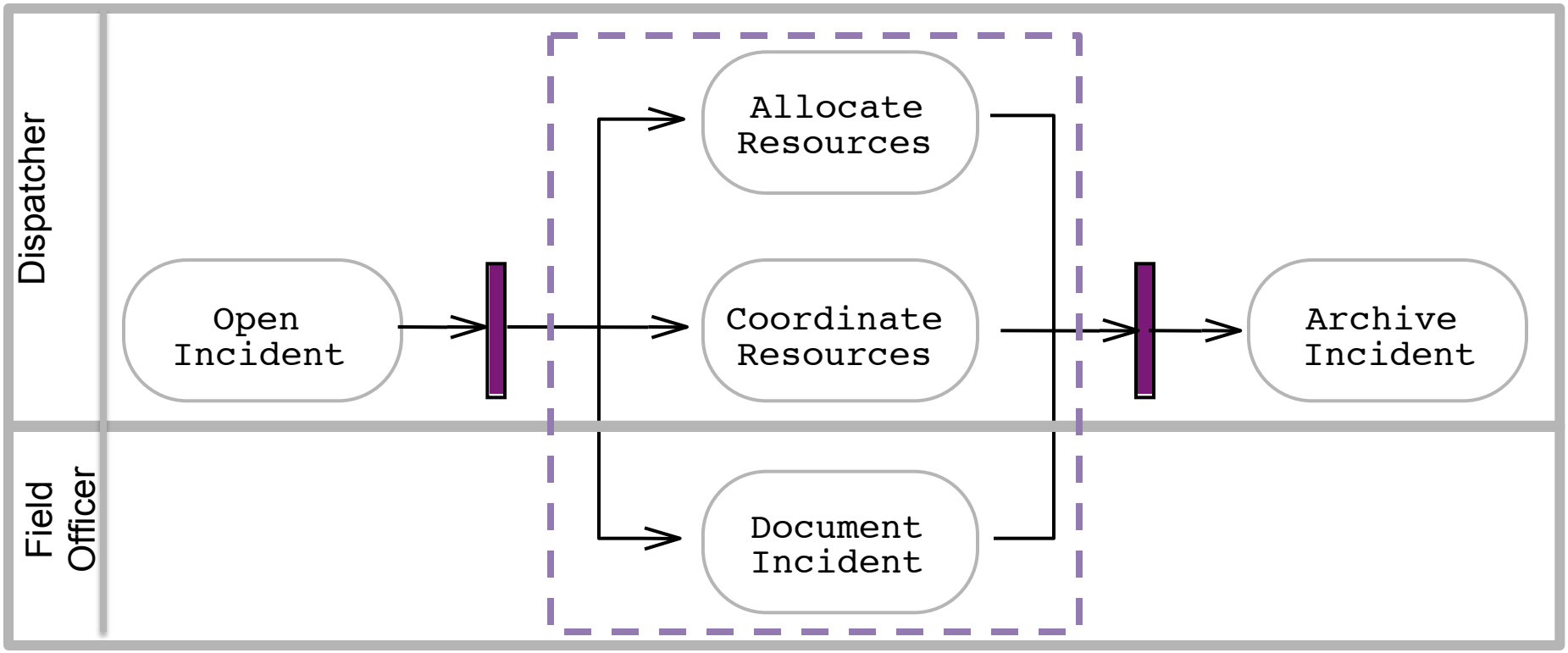


- **Decision**
  - Diamond
  - Condition
  - Branches
    - *Yes/No*
    - *Qualifies/Does not qualify*
    - *Registered User/Guest.*



Fork/Join- Concurrency

- Dotted box around activities that happen concurrently.
- Bar to split/merge flow.



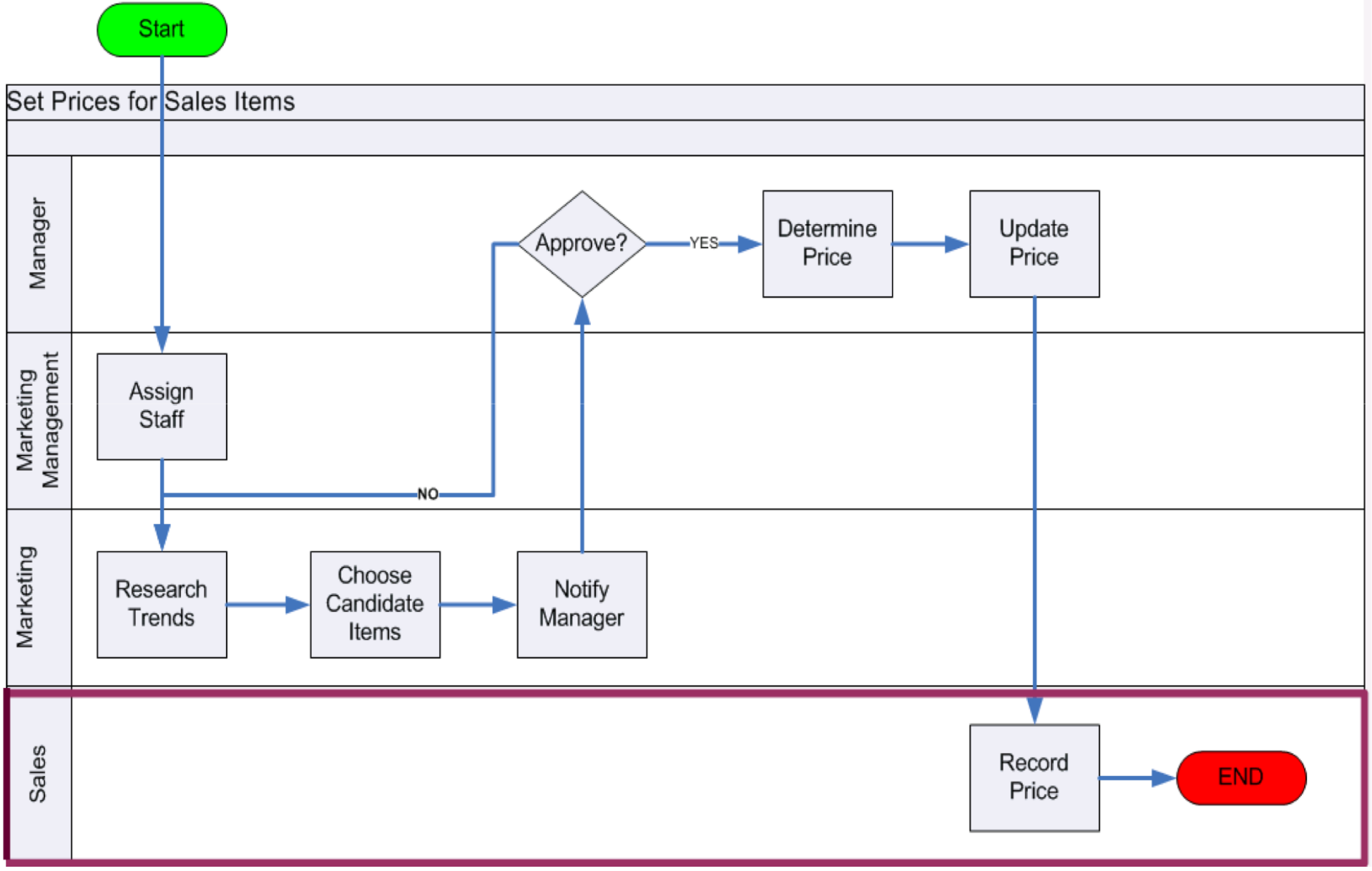
Activity Diagrams - How

Current State

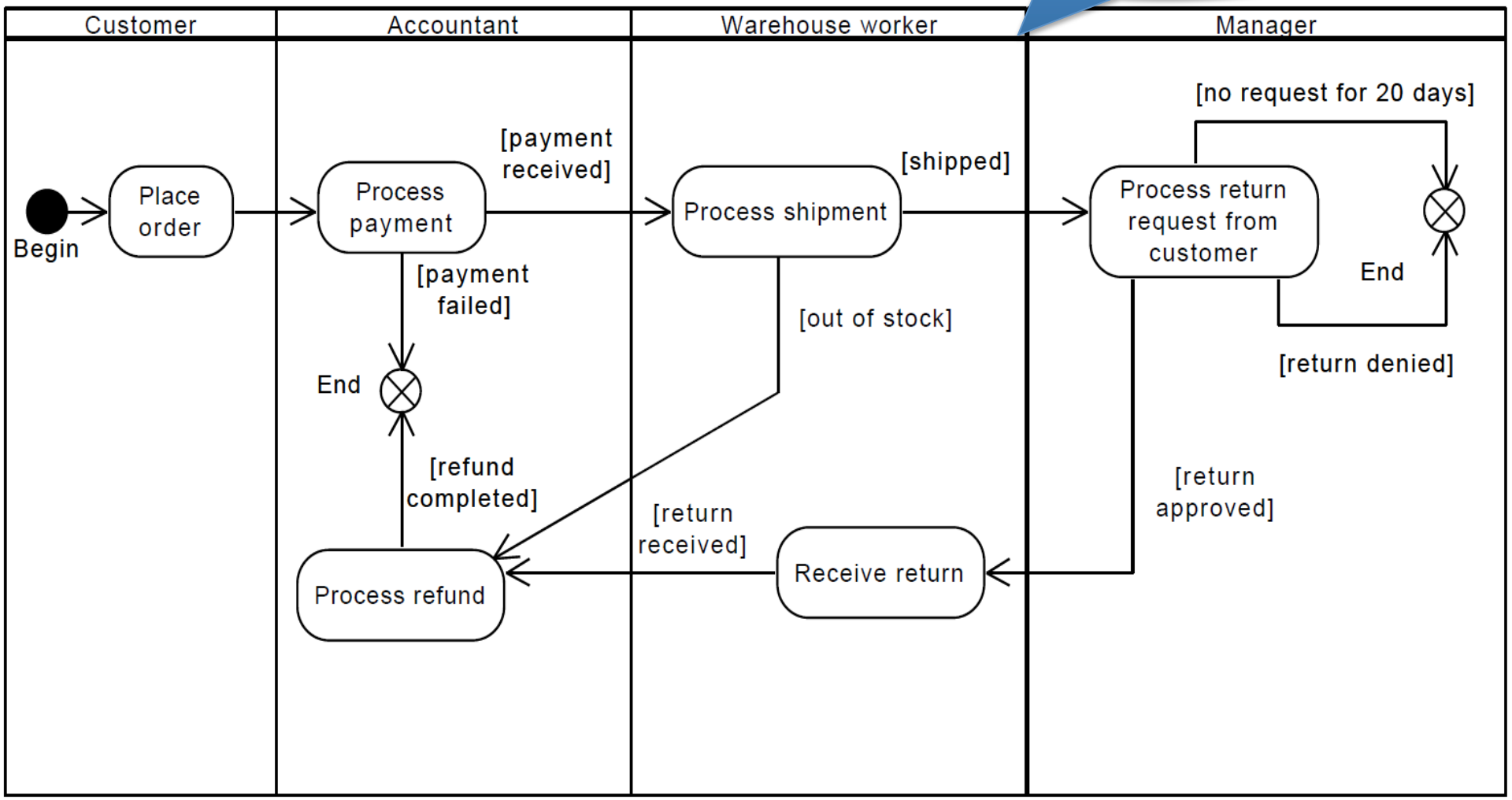
- **Name** the Diagram
- Identify and Define **Actors** (roles)
- Identify **steps** from beginning to end
  - Flag hotspots
  - Flag – but do not detail – business exceptions
- Determine how to handle **business exceptions**
- *If time permits, create a wish-list for reduction or removal of hotspots*

Future State

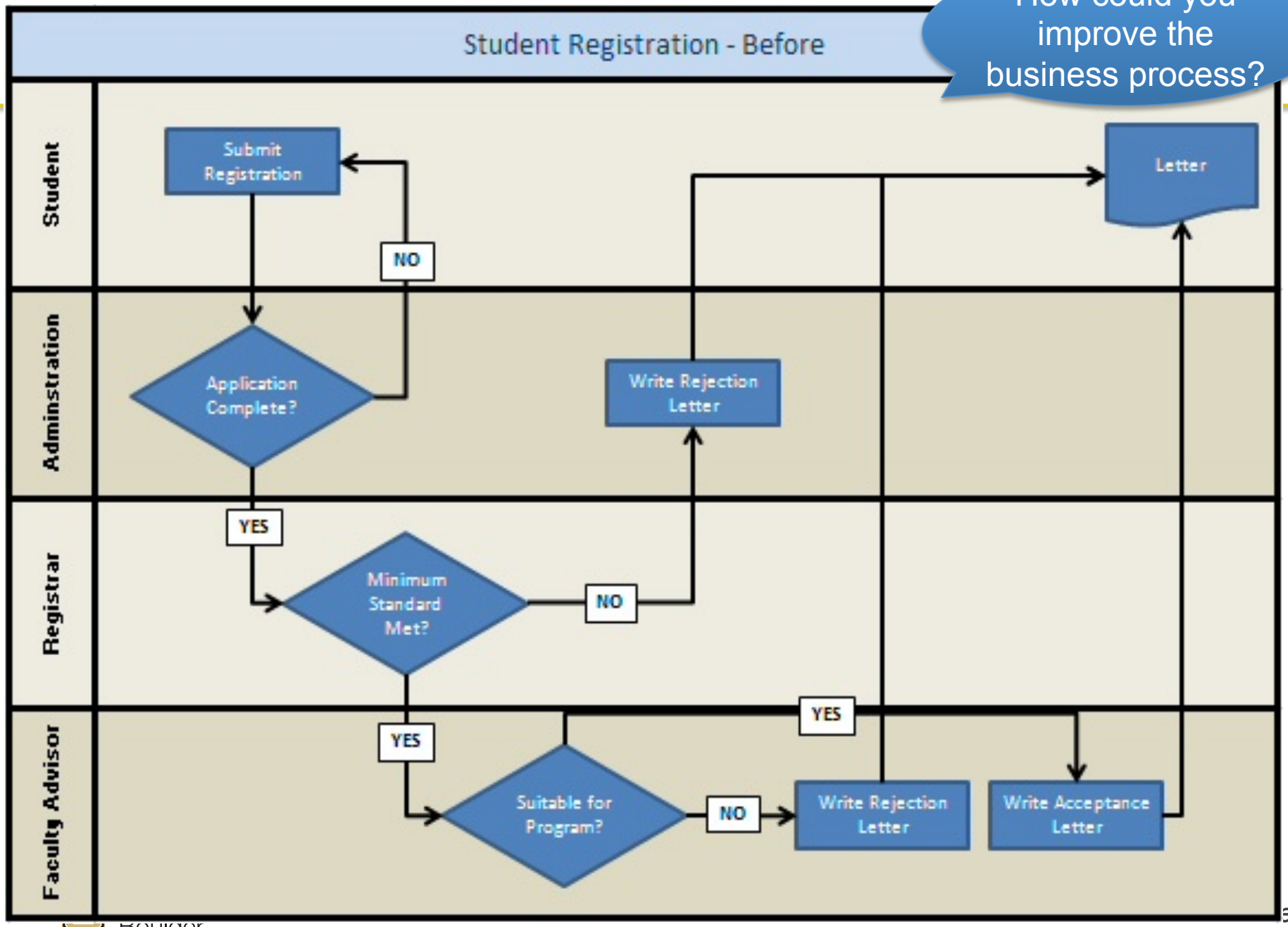
- Include system swim lane
- Optionally flag benefits of one or more steps *(instead of hotspots, which should – hopefully – be removed)*


Start
Set Prices for Sales Items
Manager
Marketing Management
Marketing
Sales
Approve?
YES
Determine Price
Update Price
Assign Staff
NO
Research Trends
Choose Candidate Items
Notify Manager
Record Price
END

How might you improve this one?

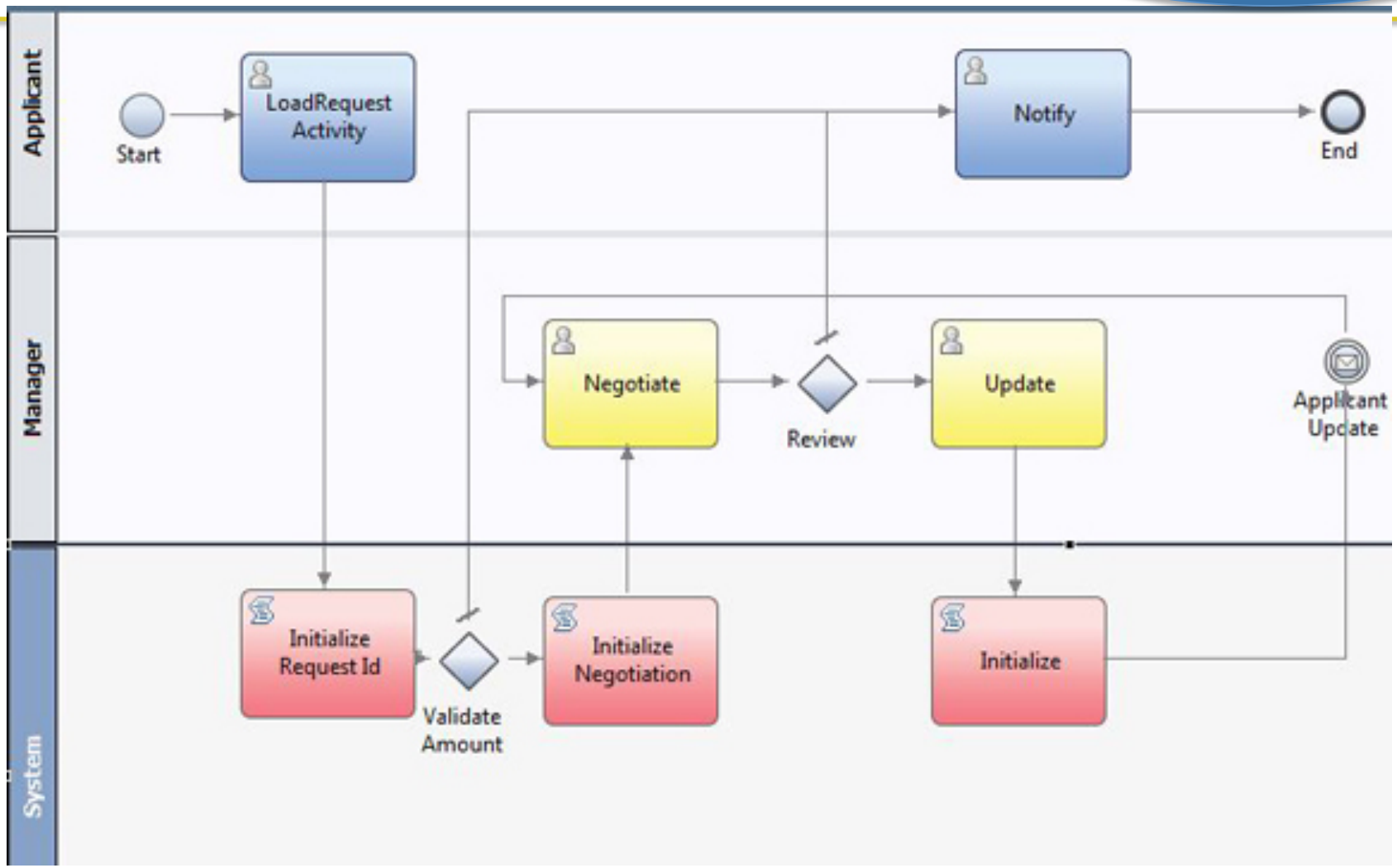


How could you improve the business process?



Bad Example AD

What's not great about this?



Differences Between Diagrams

- Activity Diagrams are an important tool whenever business workflow is important
- Ultimately, use cases usually provide the authoritative view of the bunches of requirements, especially when their scope is automation of business activities.
- Which one or both?
  - Picture thinkers vs. text thinkers
  - May need both techniques for some teams, but try to avoid redundancy
  - When an activity diagram gets very detailed, it may be time to switch to text.