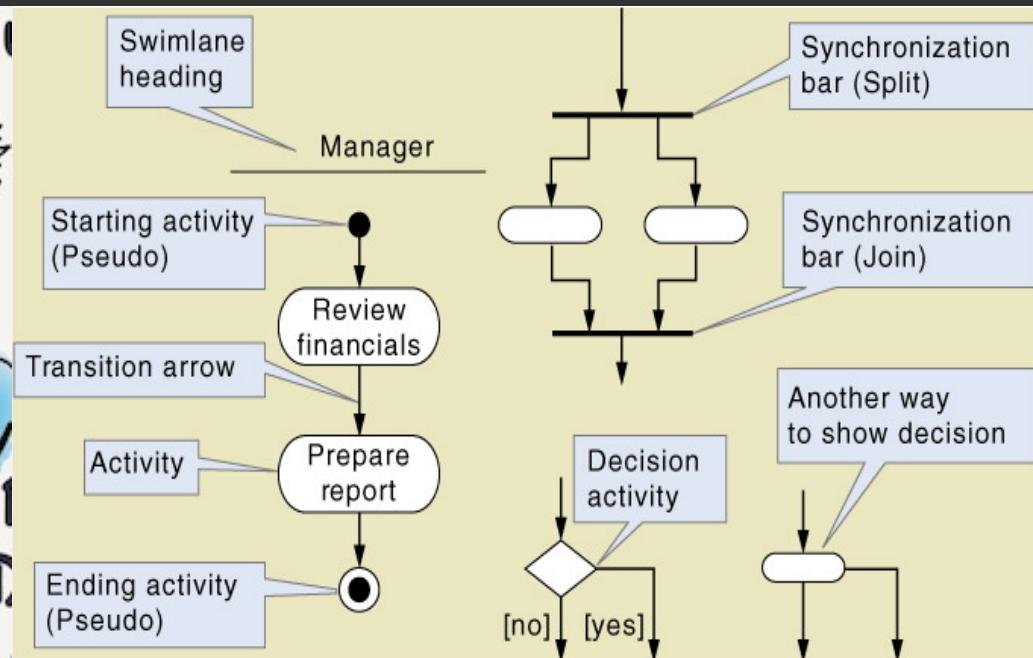




FIT2001 – Systems Development

Seminar 4: Investigating and documenting system requirements
User Stories, Activity Diagrams

Chris Gonsalvez



Our road map:

- What are Information Systems?
- How do we develop them? Systems Development (SDLC) – key phases
- Development Approaches – Focus on Agile
- Some System Development roles and skills
- Understand the requirements gathering process
- Managing stakeholders
- Requirements gathering techniques

- Why modelling?
- Investigating and documenting requirements
 - User Stories
 - Activity Diagrams

At the end of this topic you will:

- Explain the value of modelling in systems development;
- Be able to document system requirements using user stories;
- Understand the process for developing suitable user stories for a given scenario;
- Be able to document workflows with Activity diagrams.

Models - Why do we use them?

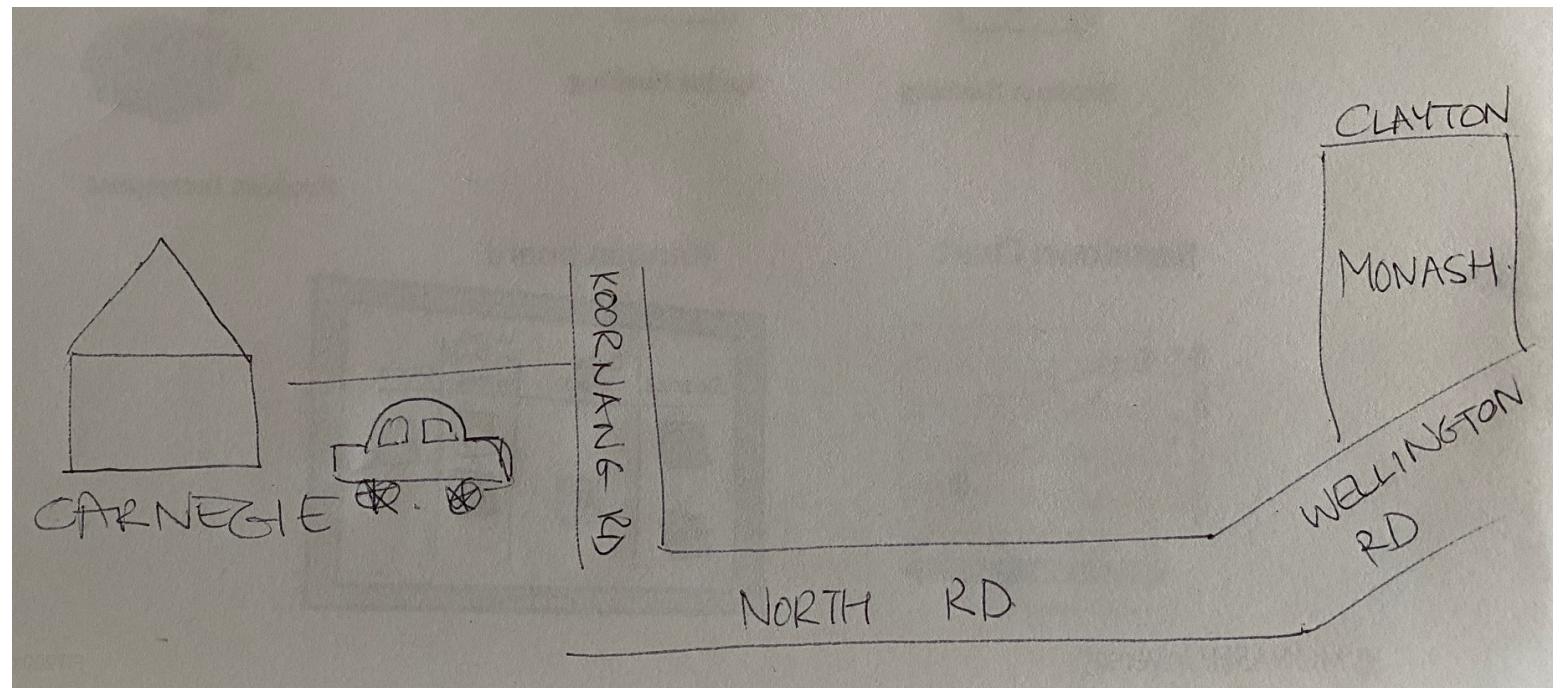
- The term ‘modelling’ has several interpretations
 - In its simplest form, the model serves as an abstraction - an approximate representation of the real item that is being built
 - It is a simplified picture of complex reality



Why model ?



- Spend a few seconds drawing how you would normally get to Uni from your home

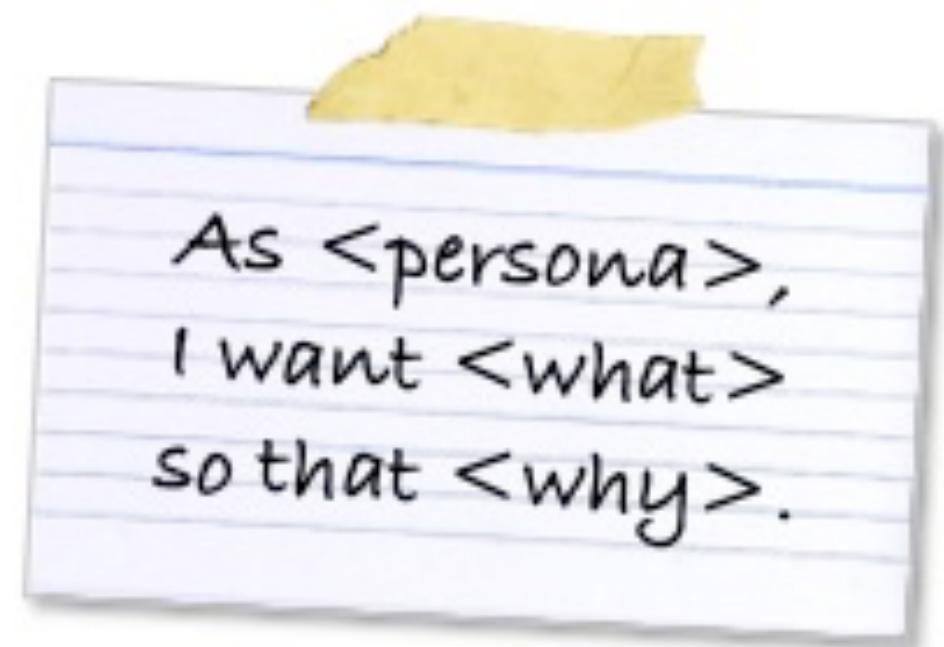


Reasons for modeling in systems analysis

- Reducing complexity of systems to be built by abstraction
- Communication with other development team members
- Communication with stakeholders/users
- Learning from the modelling process
- Documenting all the details of requirements for future maintenance/enhancement - *represents some key aspects of the system being built*
- *Some examples: Activity diagrams, Class diagrams, Use Case diagrams, Sequence diagrams*

Gathering requirements in Agile User Stories – What are they?

- Short, simple description of a product feature – told from the perspective of the user who wants that feature
- They go into the Product Backlog



Examples of User Stories:

- As a student, I want to find my grades messaged to me so that I know my results at the earliest possible time.
- As a book buyer, I want to read reviews of a selected book so that I can make a decision to buy it or not.
- As a parent, I want to see my child's attendance online so that I can take appropriate action if they are not attending

This is high level – they also have acceptance criteria

Why User stories?

- Encourages user communication and collaboration and real-time feedback
- Focus on end user value
- Planning is simplified – if it's too big and you can't estimate, make it smaller
- Avoids locking in design detail too early – focuses on the WHAT - leaves the technical aspects to the developers, testers, etc.
- Users do not need to be trained to understand User stories
- Never out of date ... just in time
- Eliminates weighty documentation – create what you need to deliver the story

Why User stories?

- **Easier to communicate with users – Example:**

Where does your mind go when I say:

- Steel body
- 4 wheels
- Tyre mounted to each wheel

The focus is on System attributes



User stories focus on User's goals

As a lazy man I
want to mow my lawn
quickly and easy

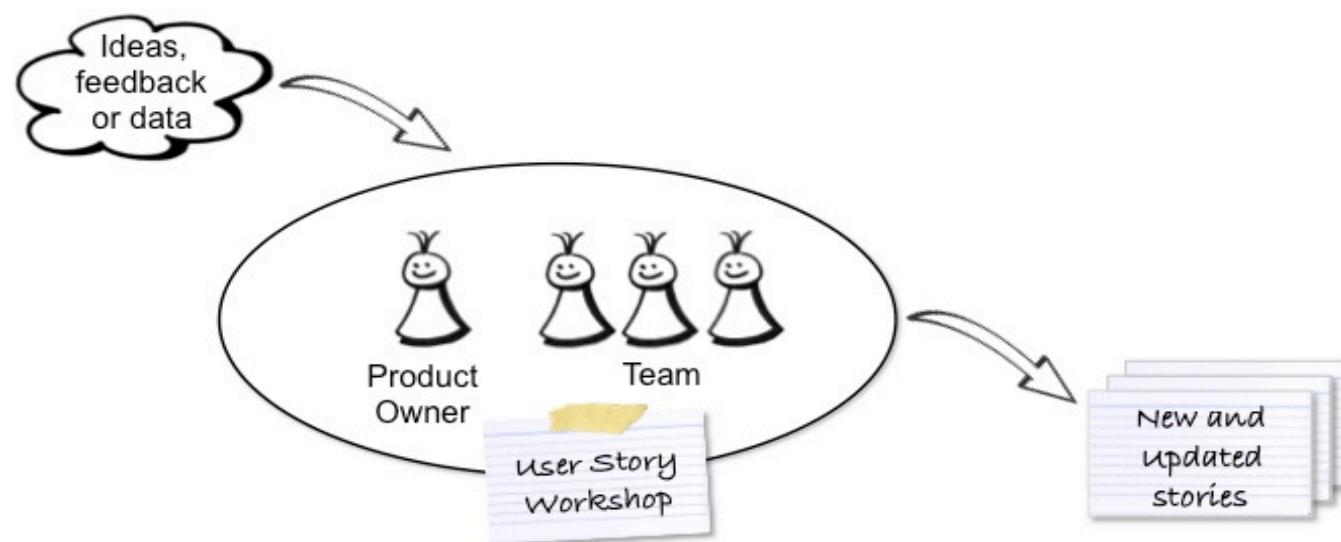
As a lazy man I
want to feel
comfortable while
mowing my lawn



Writing User Stories - The process

7. Story Writing Workshops (Seminar 3)

- An good way to have a shared vision for the product
- Encourage the entire team to participate in the process - includes Product Owner, Development Team, and can include Users and Stakeholders ... Scrum Master usually facilitates



Running Story Writing Workshops

Possible steps

1. Focus the meeting on a single objective
 2. Map the big picture – brainstorm, list of things users do, cluster, remove duplicates
 3. Add user stories
 4. Visualise the relationship between stories - Story mapping
 5. Map out releases
-
- Sticky notes, markers, whiteboard - very visual
 - Not too long, very interactive

How do you write User Stories

... The 3 Cs

by Ron Jefferies

CARD

Traditionally written on
index cards – short,
concise

Annotated with notes,
models, prototypes

CONVERSATION

*Story details come out
of conversations with
the Product Owner (User)*

CONFIRMATION

*What is going to make
the User accept the
story as completed?*

How do you write User Stories? ... Use a template as a starting point

- 1 Define your **end user**
- 2 Specify what **they want**
- 3 Describe **the benefit**
- 4 Add **acceptance criteria**

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... Don't get hung up on the words and the format - the key is to understand what the user wants

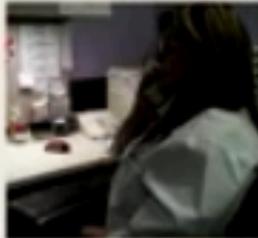
“As a <user role>, I <want/need/can/etc> <goal> so that <reason>.”



How do you write User Stories? ... Identify the user type

- Avoid the generic role "User"
- Focus on the personas who interact with the system or who realize some value or benefit from the system
 - Who is this user? What motivates them? Who is an example of such a user?

Rita
the Reseller



Rhonda
the Receptionist



Amy
the Assistant



Esteban
the Executive



Chuck
the Call Center



How do you write User Stories? ... Ask questions

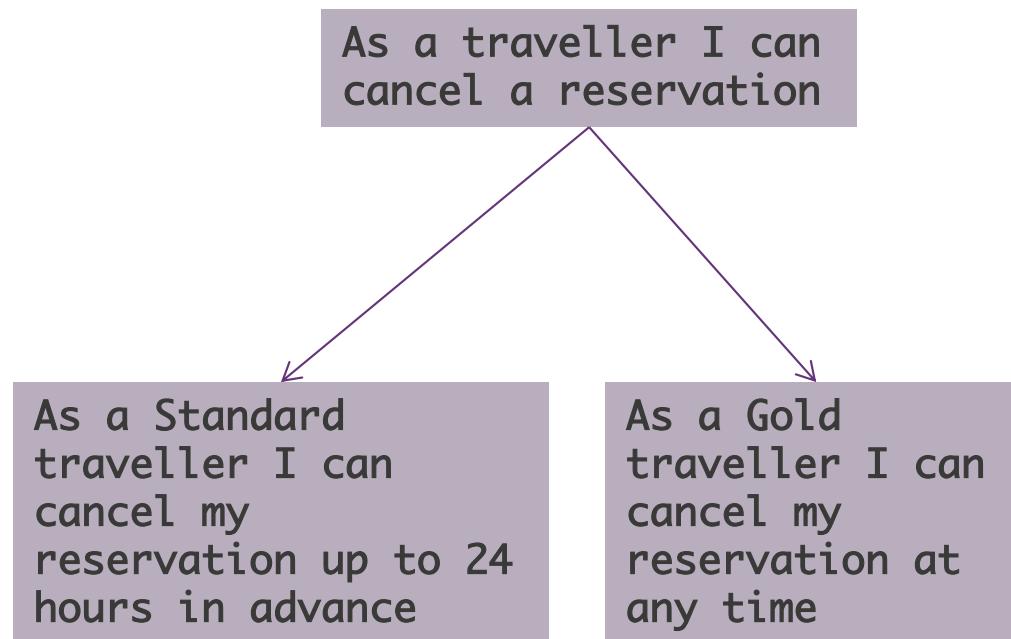
- What else might users of the system have done?
- What could go wrong, and what would the user have to do to recover?
- What might other types of users do to reach their goals?
- Wouldn't it be cool if... ?

How do you write User Stories? ... get the size right

- Should be small enough for the development team to create in a short time period.
- Should be big enough to represent business value in its own right -- it might build on something that has been done before
- Should be able to be delivered in its own right -- you might not want to do so but if you needed to you could.
- **User stories that are too big, are harder to understand, estimate, and implement successfully.**

How do you write User Stories? ... Story too large?

- EPIC - a LARGE story that is split into smaller user stories that share a strategic objective
- Product Backlog items tend to start as epics that are broken into smaller user stories during Sprint planning



- An epic will typically be delivered over several sprints.

How do you write User Stories? ... adding the Acceptance criteria

As a credit card holder, I want
to view my statement balance,
so that I can pay the balance
due

- Display statement balance upon authentication
- Display Total Balance
- Show "Payment Due Date" and "Minimum Payment Due"
- Display Error message if service not responding/ timeout

Acceptance criteria - a set of predefined requirements that must be met in order to mark a user story complete.

- Reduces ambiguity
- Prevents miscommunication
- Clearly defines what you need to test to meet the user's requirements

Example 1:

As a purchaser on the website

I want the ability to pay with a credit card

So that I can confirm my purchase immediately

Acceptance criteria:

- Accept Visa, Mastercard, Amex
- Accept valid credit cards – valid cc#, valid expiry date, valid cvv no.
- Generate purchase payment confirmed message
- Generate purchase payment failed message

Example 2:

As an online customer

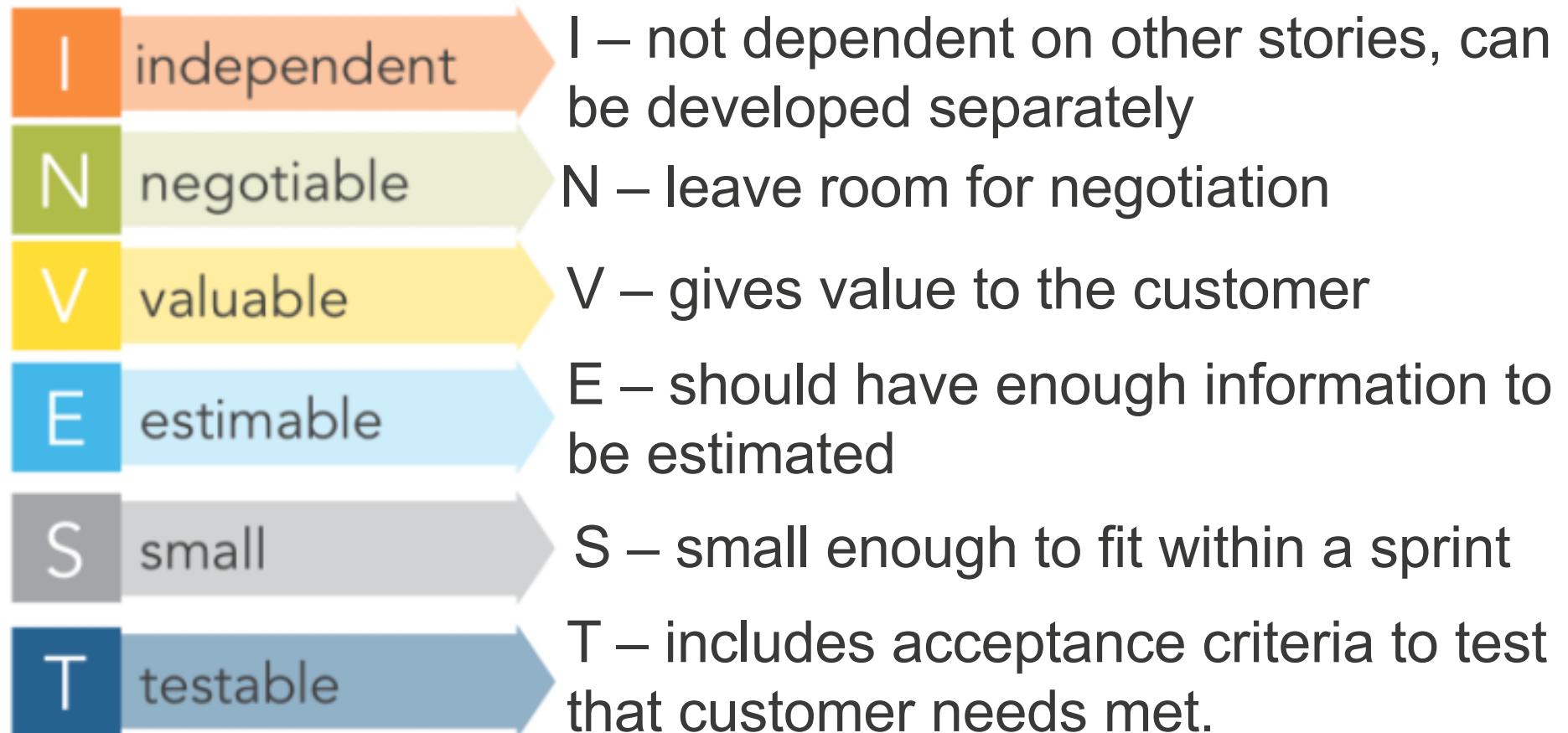
I want to be able to register online

So that I can start shopping online

Acceptance criteria:

- Customer must be able to submit registration form online
- The email used must not be a previously used email
- Customer must complete all mandatory fields on form
- Customer must receive a confirmation email with link after valid submission
- Registration must be confirmed after they click the link

How good is your User Story? INVEST



Ref: Bill Wake – Extreme Programming Explored

User Story - Common mistakes

- Too formal / too much detail
 - could result in skipping the conversation
- Technical tasks impersonating user stories
 - Does this represent what the user wants?
- Skipping the conversation
 - Risk moving in the wrong direction, overlooking specific customer needs

READ: Writing a great user story: <https://help.rallydev.com/writing-great-user-story>

Writing User Stories



- If Monash was developing a new Web Enrolment system – write 1 User Story for the ‘Student’ user and 1 User Story for the ‘Lecturer’ user

- Did you follow the template
- Did you remember the conditions of satisfaction (the acceptance criteria)

“As a <user role>, I <want/need/can/etc> <goal> so that <reason>.”

Story Mapping

- Helps arrange user stories into a useful model for understanding the functionality of a system
- Helps identifying holes and omissions in your backlog, and effectively plan holistic releases that deliver value to the business
- Walk through the activities and ask questions such as:
 - What will the user most likely want to do next?
 - What mistakes could a user make here?
 - What could confuse a user at this point?
 - What additional information could a user need?
- *If multiple personas ask questions for each persona*

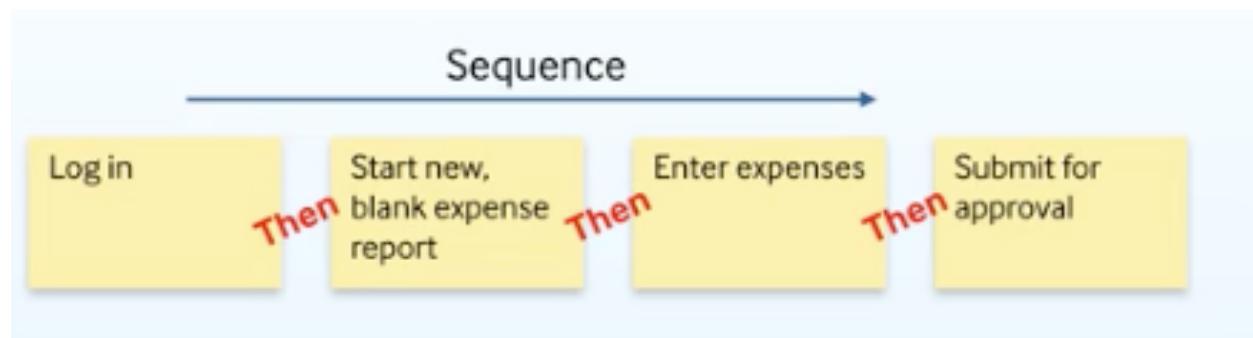
Story Mapping

- Example – Develop software to allow company employees to submit their expense reports and be reimbursed

Ref: Michael Cohn – Better User Stories

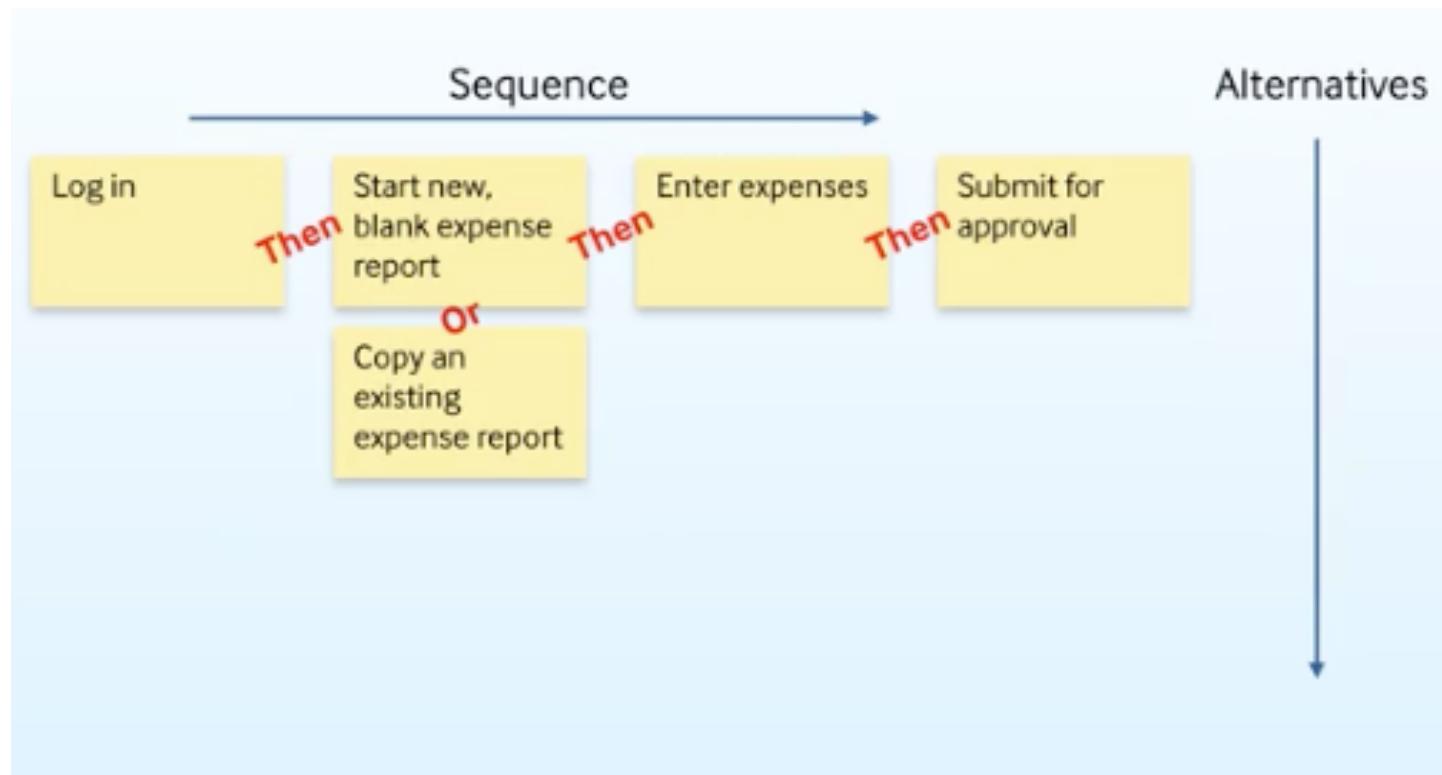
- Two dimensions
 - Sequence
 - Alternatives

1. We start with the sequence of activities in the process – ask Questions



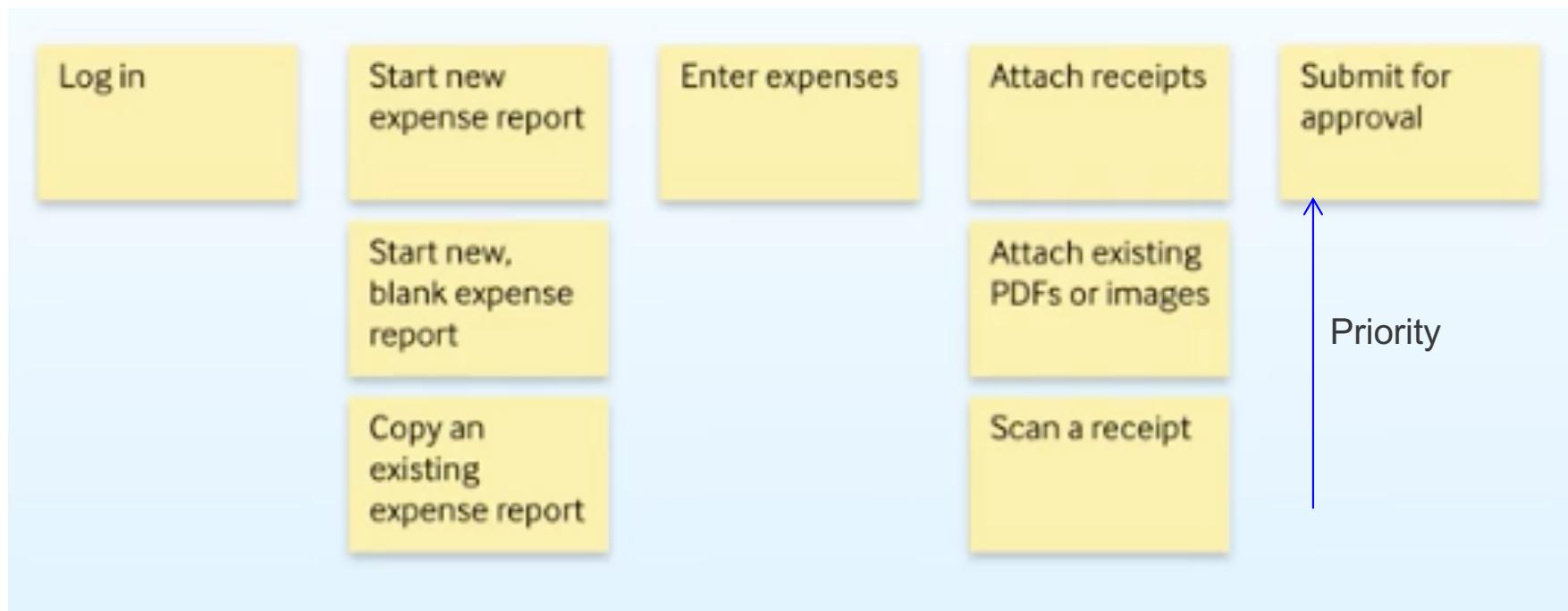
Story Mapping

2. We then look at possible alternatives for activities



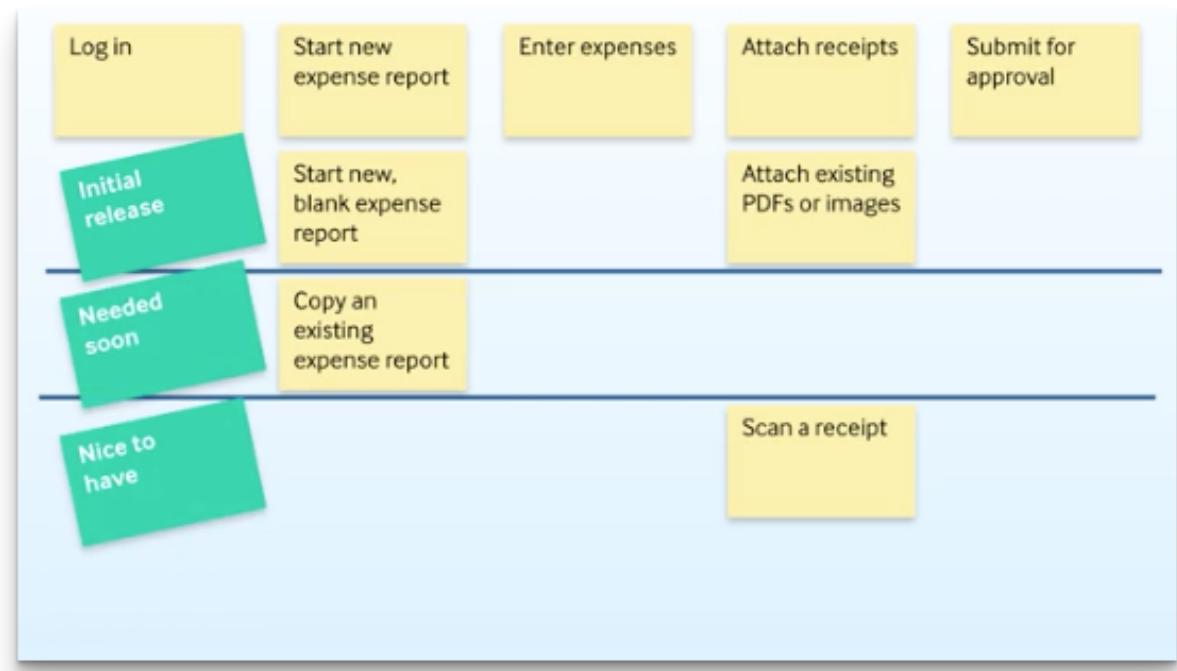
Story Mapping

3. More alternatives identified, a forgotten process added – the higher the value the higher up the story is placed on the alternative axis.



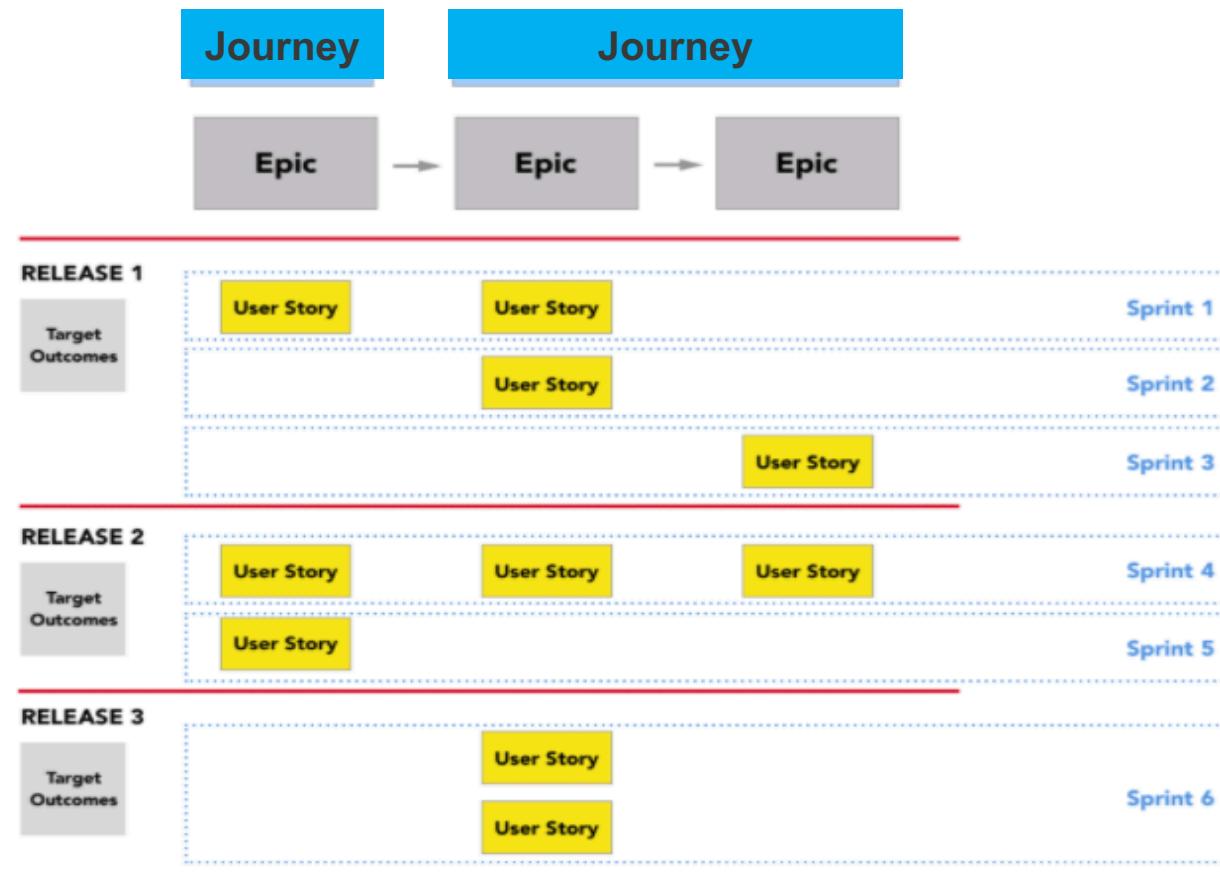
Release planning

- A Release is a set of functionality that makes sense to deliver to users at the same time – can include stories from different Epics
- Create horizontal swim lanes for each release – move stories up or down to form collections that would be the most important to build



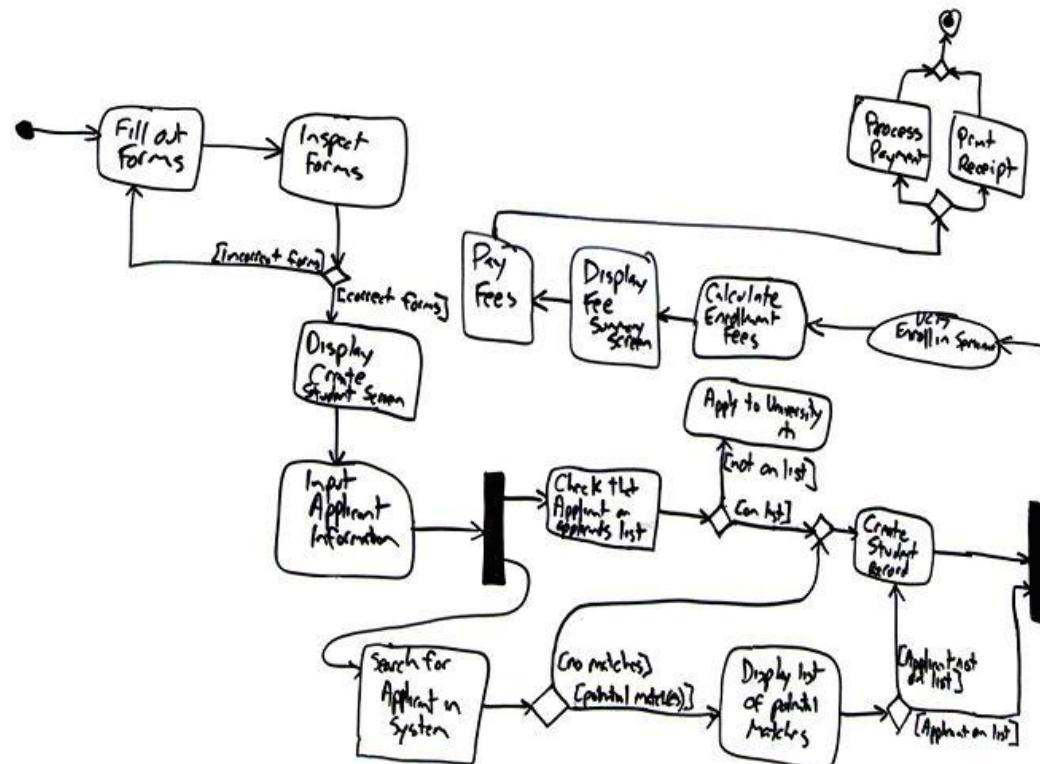
Release planning

- A Release can include multiple sprints
- Release 1 – 4 user stories make sense to be given to users



Activity diagrams

- “Activity diagrams are a technique to describe procedural logic, business processes, and work flows” - M. Fowler
- They add meaning/detail to our user stories (if required)

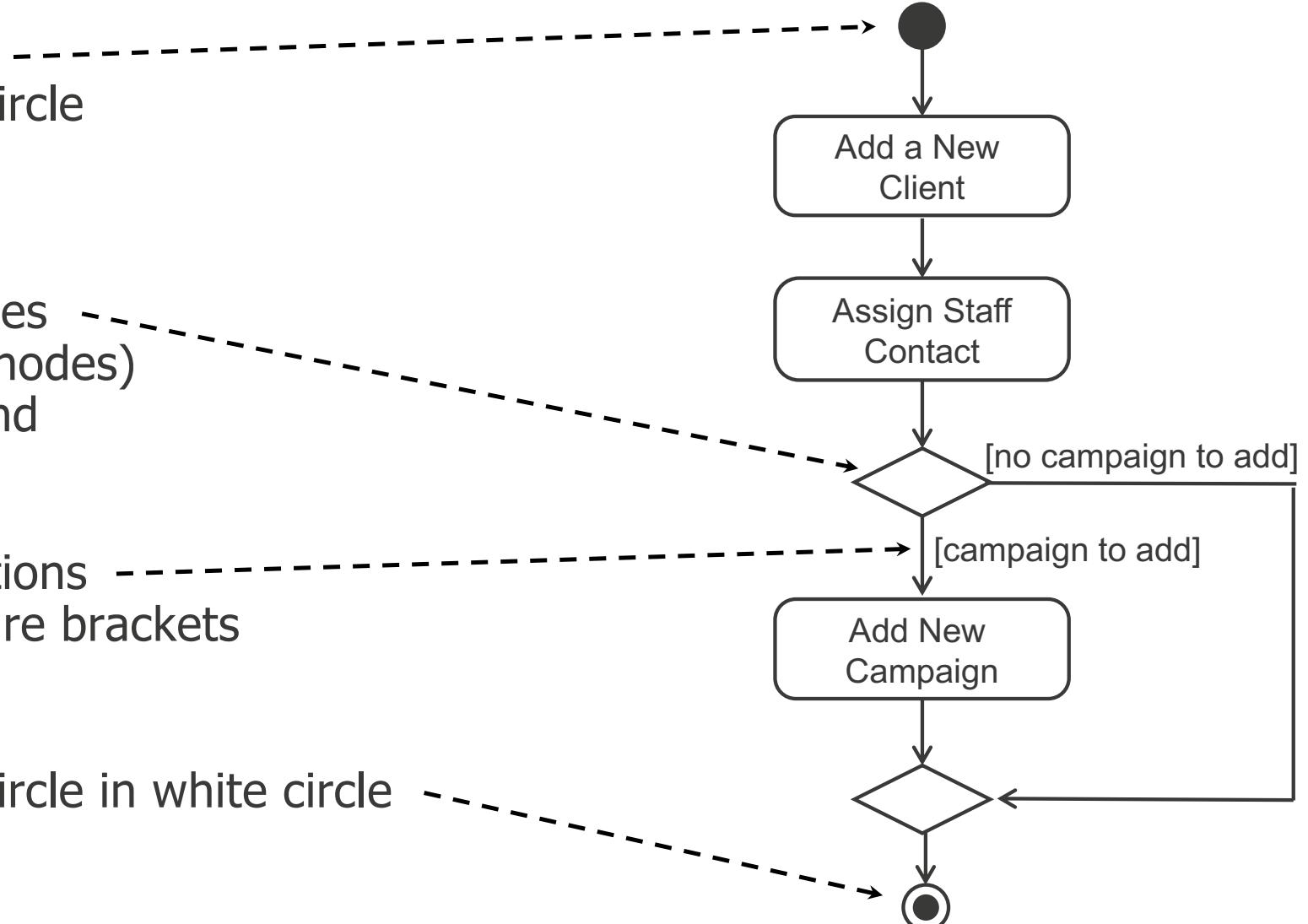
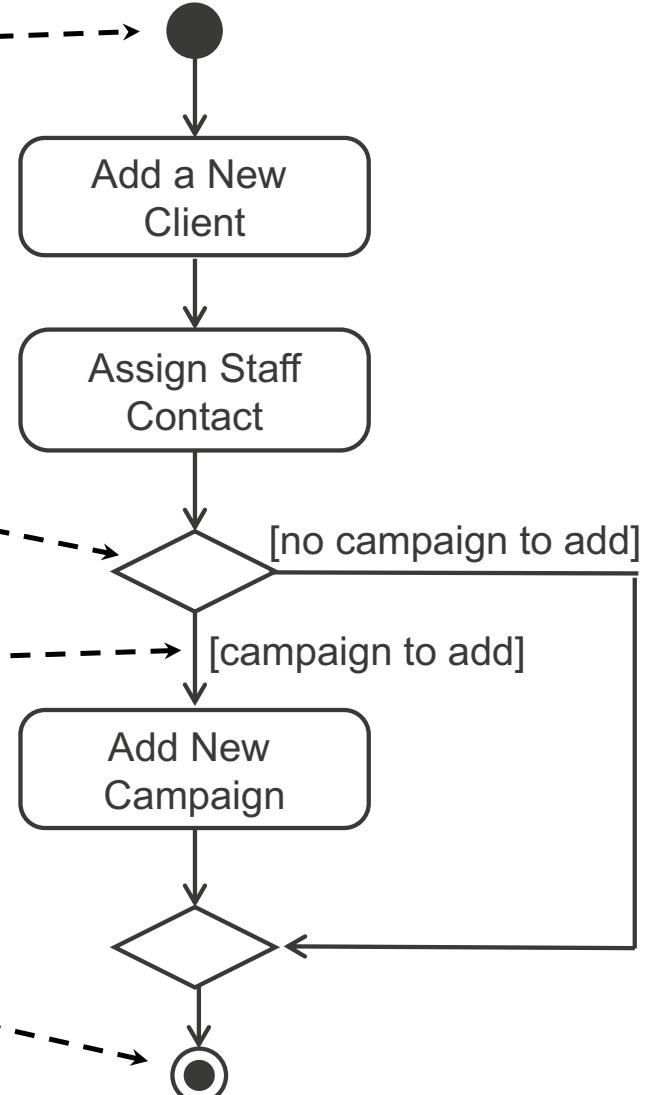
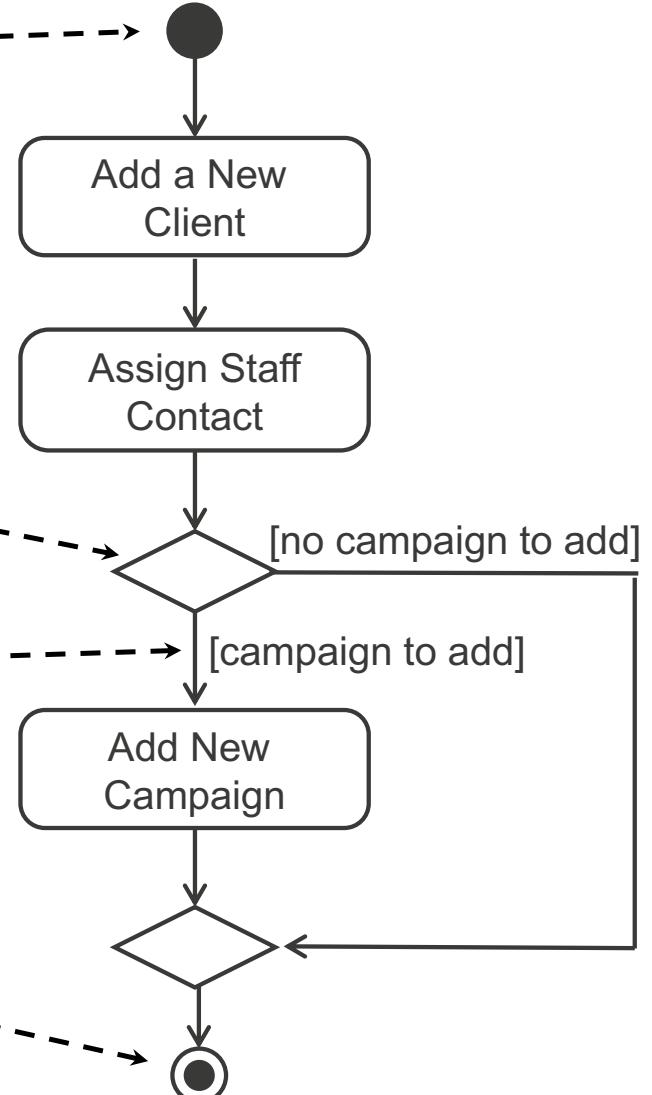


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Activity diagram symbols.1

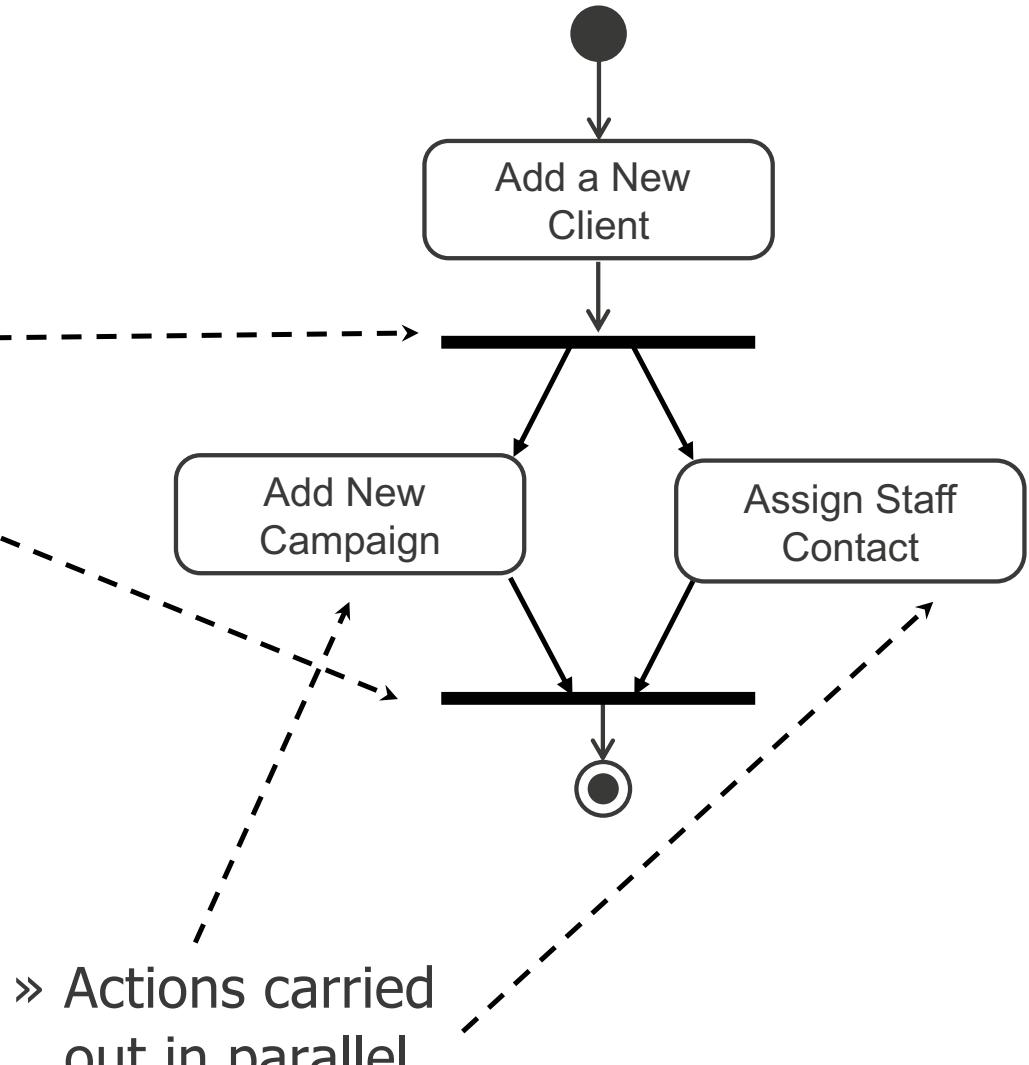
- Activity / Action
 - rectangle with rounded corners
 - meaningful name
 - Control flows
 - arrows with open arrowheads
 - Notes
-
- ```
graph TD; A["Add a New Client"] --> B["Assign Staff Contact"]; B --> C["(Client logs out of the system.)"]
```

# Activity diagram symbols.2

- Initial node  
– black circle
- Decision nodes  
(and merge nodes)  
– Diamond
- Guard conditions  
– in square brackets
- Final node  
– black circle in white circle

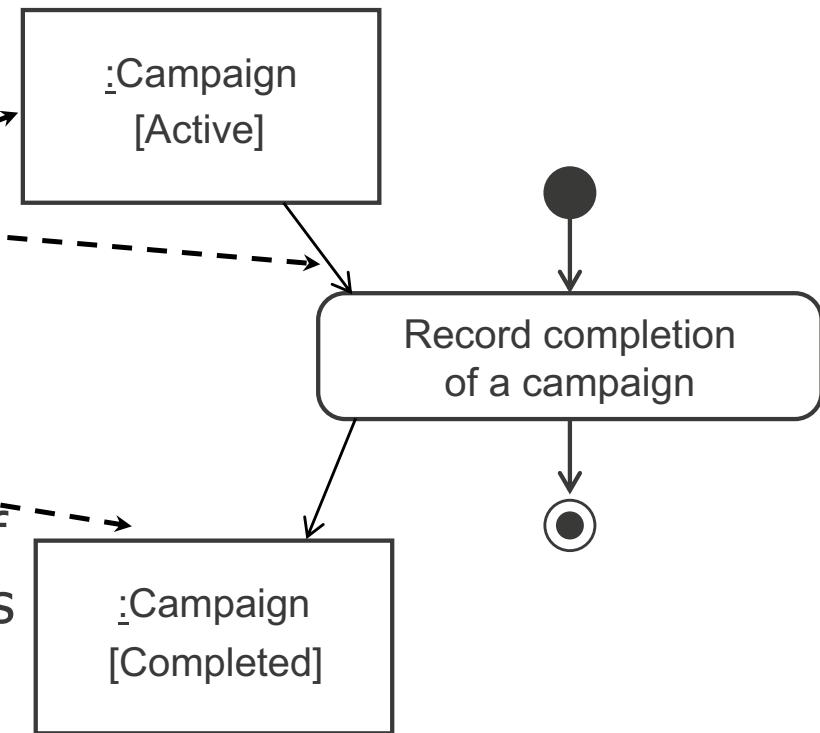
# Activity diagram symbols.3

- Split/Fork nodes  
and Join nodes
  - thick bar



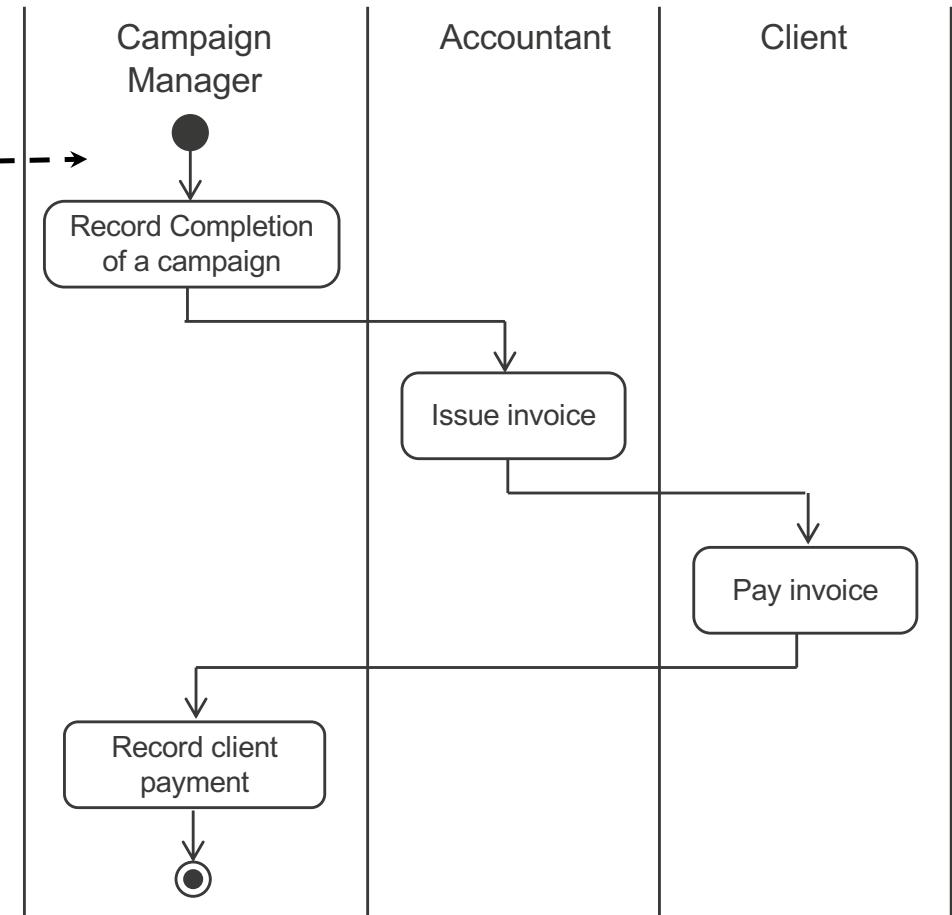
# Activity diagram symbols.4

- Object flows
  - open arrow
- Objects
  - rectangle
  - optionally shows the state of the object in square brackets



# Activity diagram symbols.5

- Activity Partitions (Swimlanes)
  - vertical columns
  - labelled with the person, organisation, department or system responsible for the activities in that column

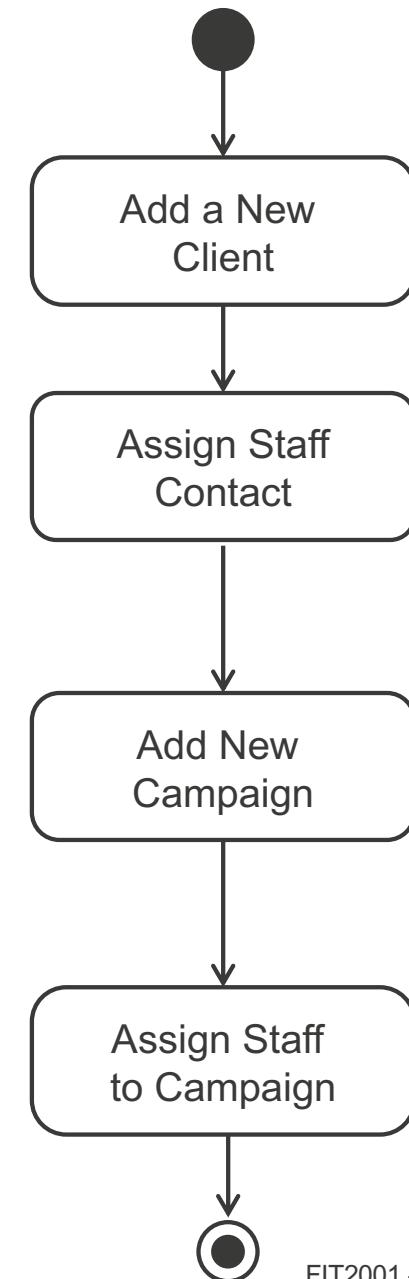


# Scenario for Activity diagram discussion

- *When a new client has been accepted by our marketing firm, we assign them a staff contact to look after them. If they have requested a marketing campaign, we add a new campaign. We then assign staff resources to the campaign as required.*

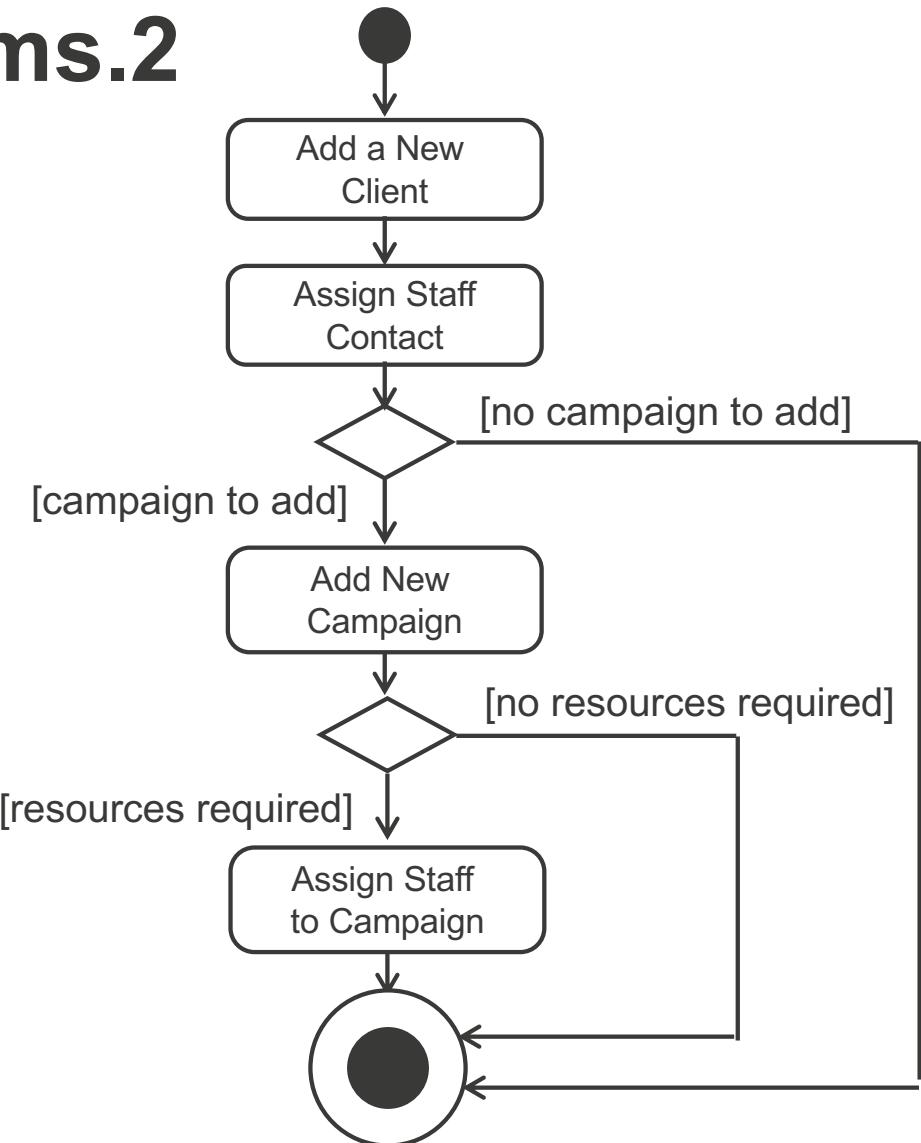
# Drawing Activity diagrams.1

- Identify actions
  - What happens when a new client is added to the system
    - Add a New Client
    - Assign Staff Contact
    - Add New Campaign
    - Assign Staff to Campaign
- Organise the actions in sequential order with flows



# Drawing Activity diagrams.2

- Identify any alternative flows and the conditions on them
  - sometimes there is a new campaign to add for a new client, sometimes not
  - sometimes they will want to assign staff to the campaign, sometimes not
- Add decision and merge nodes, flows and guard conditions to the diagram

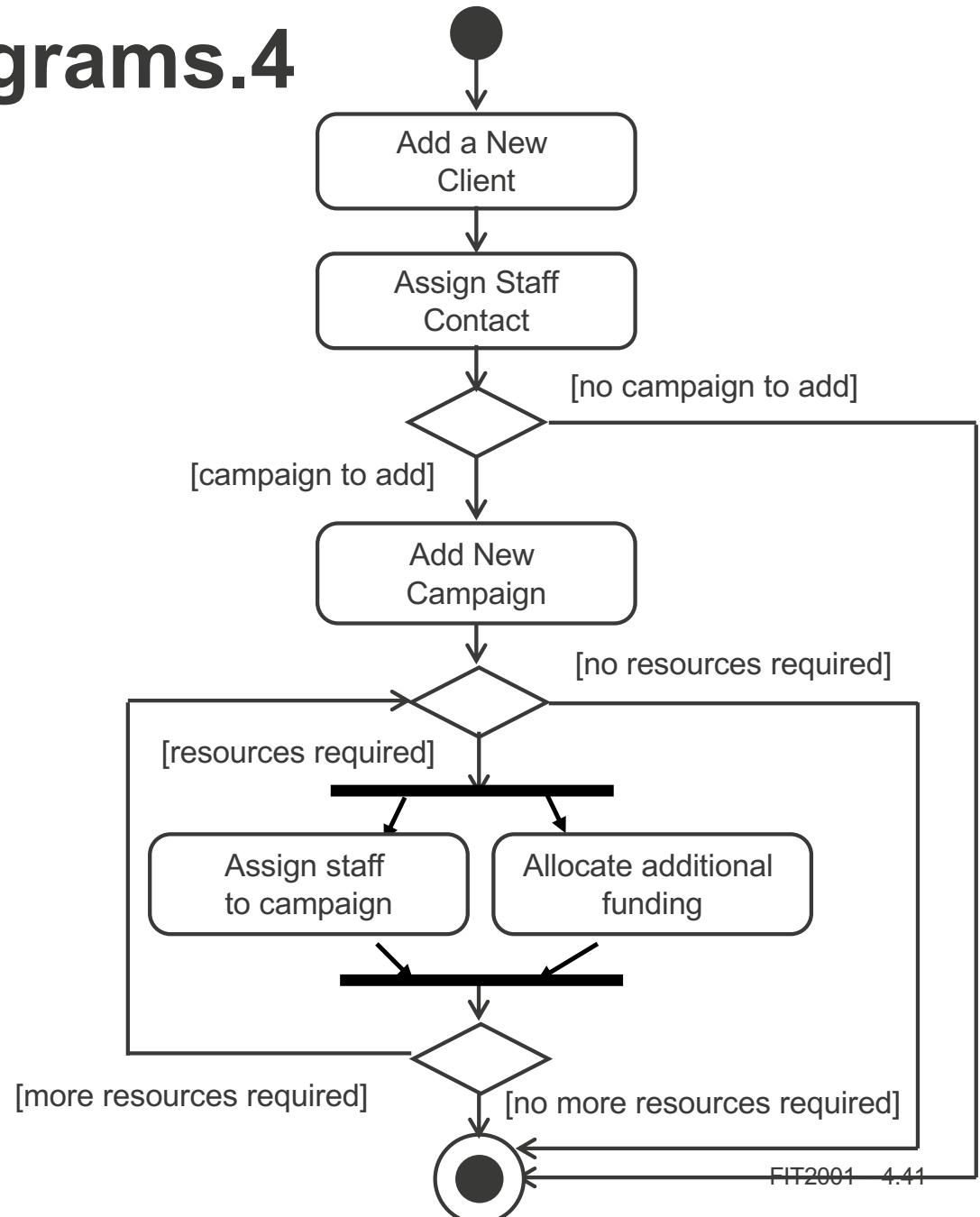


# Drawing Activity diagrams.3

- Identify any actions that are carried out in parallel
  - there are none in this scenario, but what if we said that if resources are required, we assign staff and allocate funds
- Add fork and join nodes and flows to the diagram

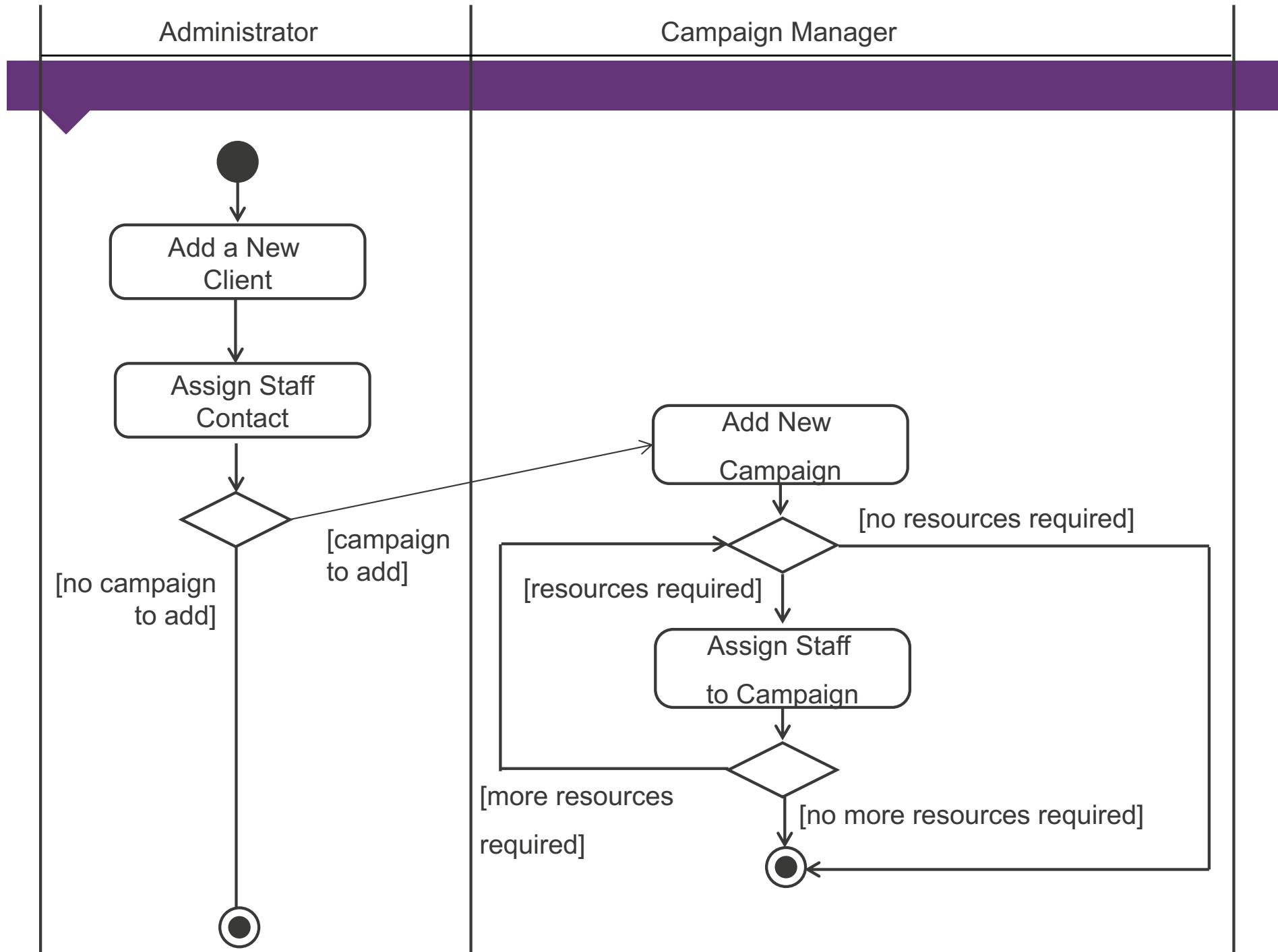
# Drawing Activity diagrams.4

- Identify any processes that are repeated
  - they will want to assign staff to the campaign until there are no more staff required
- Add decision and merge nodes, flows and guard conditions to the diagram



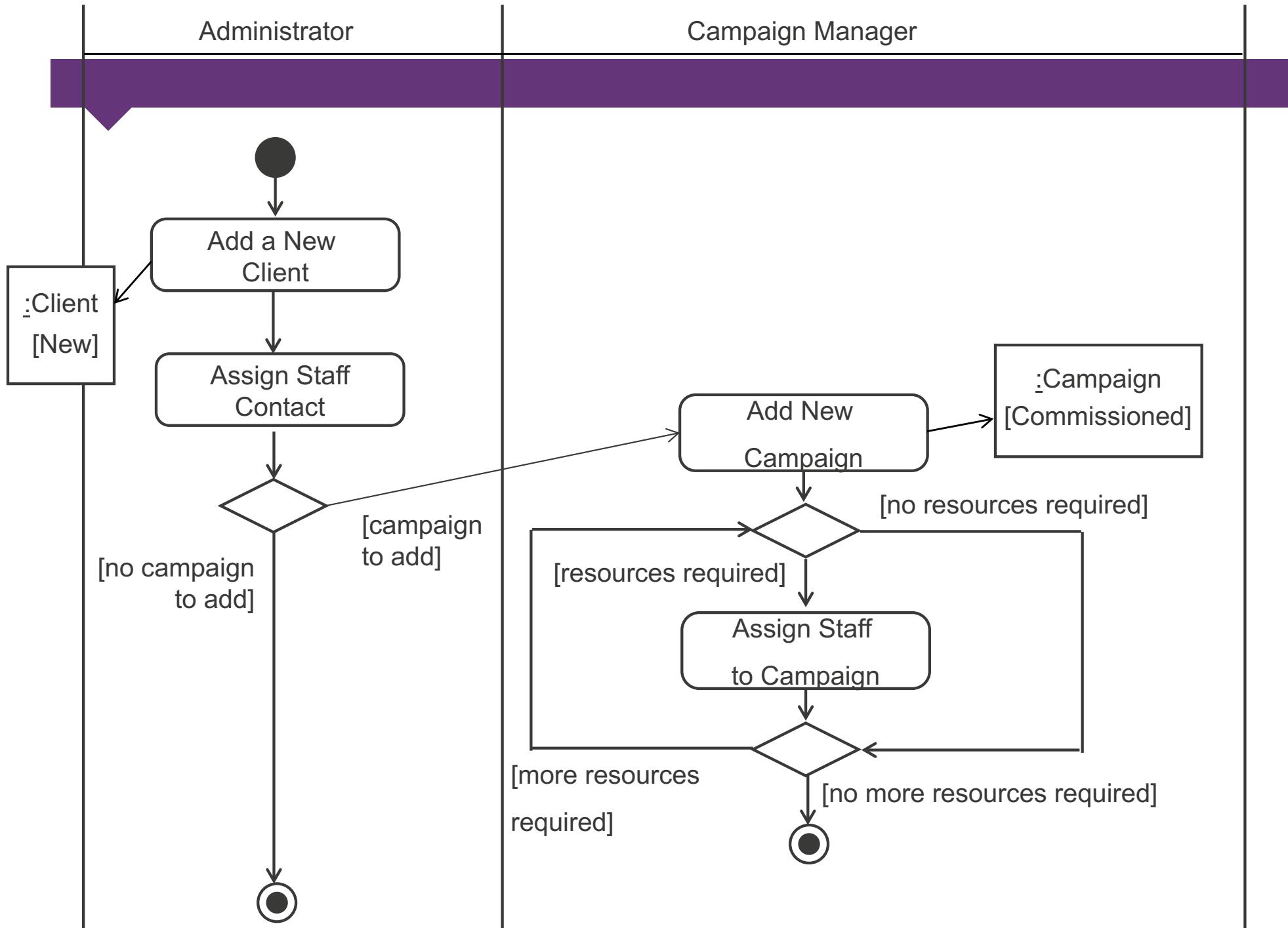
# Drawing Activity diagrams.5

- Are all the activities carried out by the same person, organisation or department?
- If not, then add swimlanes to show the responsibilities
- Name the swimlanes
- Show each activity in the appropriate swimlane



# Drawing Activity diagrams.6

- Are there any object flows and objects to show?
  - these can be documents that are created or updated in a business activity diagram
  - these can be object instances that change state in an operation or a use case
- Add the object flows and objects



# ON THE SPOT COURIER SERVICES

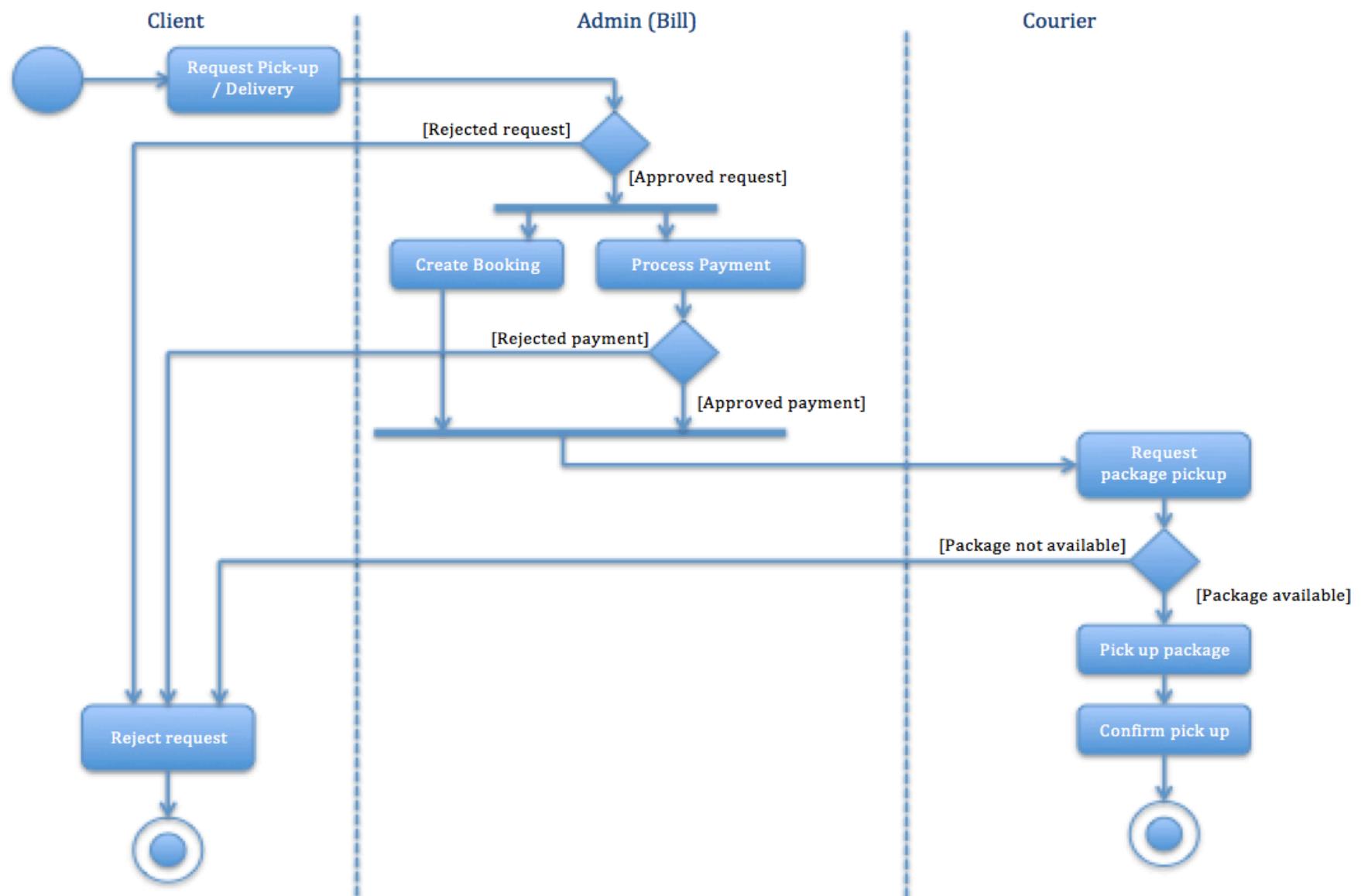
Bill Wiley – Pick-up and Delivery function

When Bill Wiley receives a request for pickup, he checks to see if the pick up is valid, and rejects it if it isn't valid. If it is valid, he enters the pickup information on a form and processes the payment. If the payment is approved, he contacts his courier staff with the pick up information, otherwise he rejects the request. When the courier picks up the package they confirm pickup. If the package is not available for pickup, the request is rejected.

**Draw an activity diagram for the Pick-up and Delivery function for On the Spot Courier Services**



# Pick-up and Delivery function: Activity Diagram

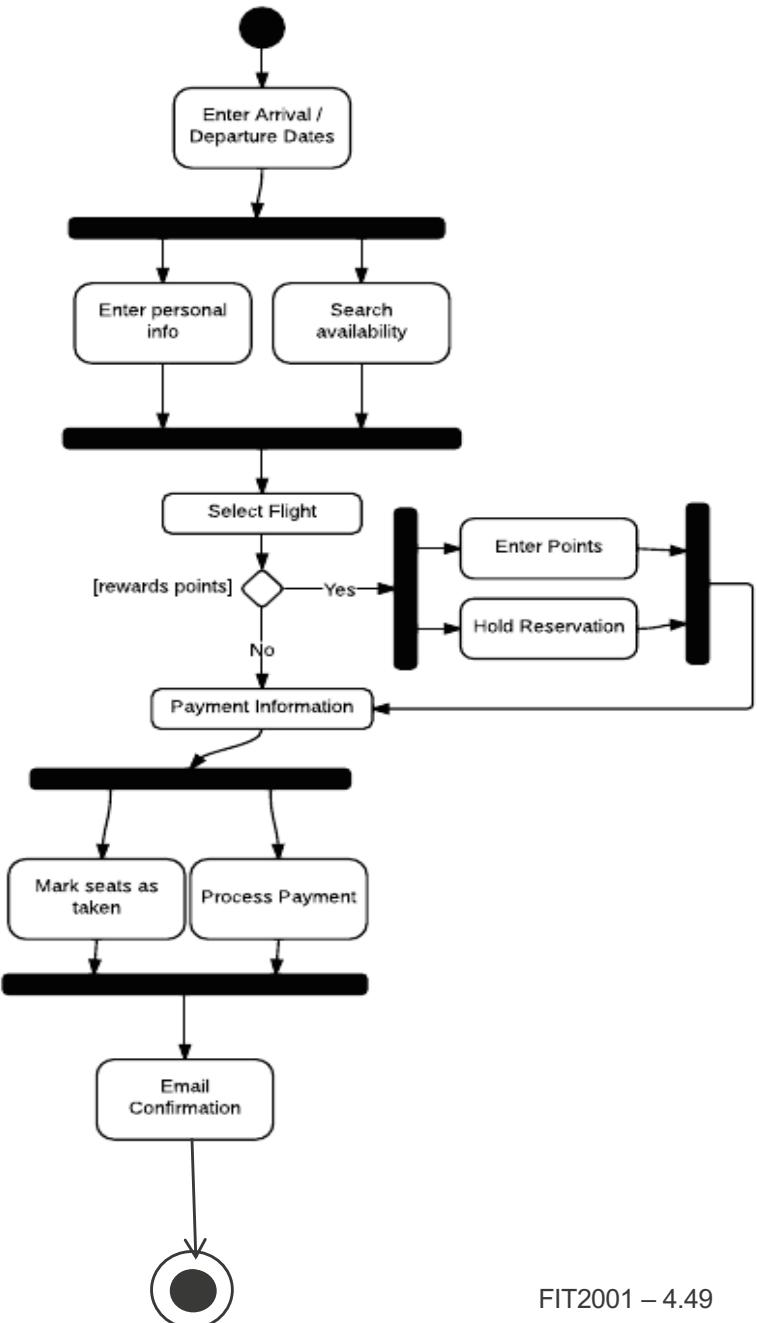




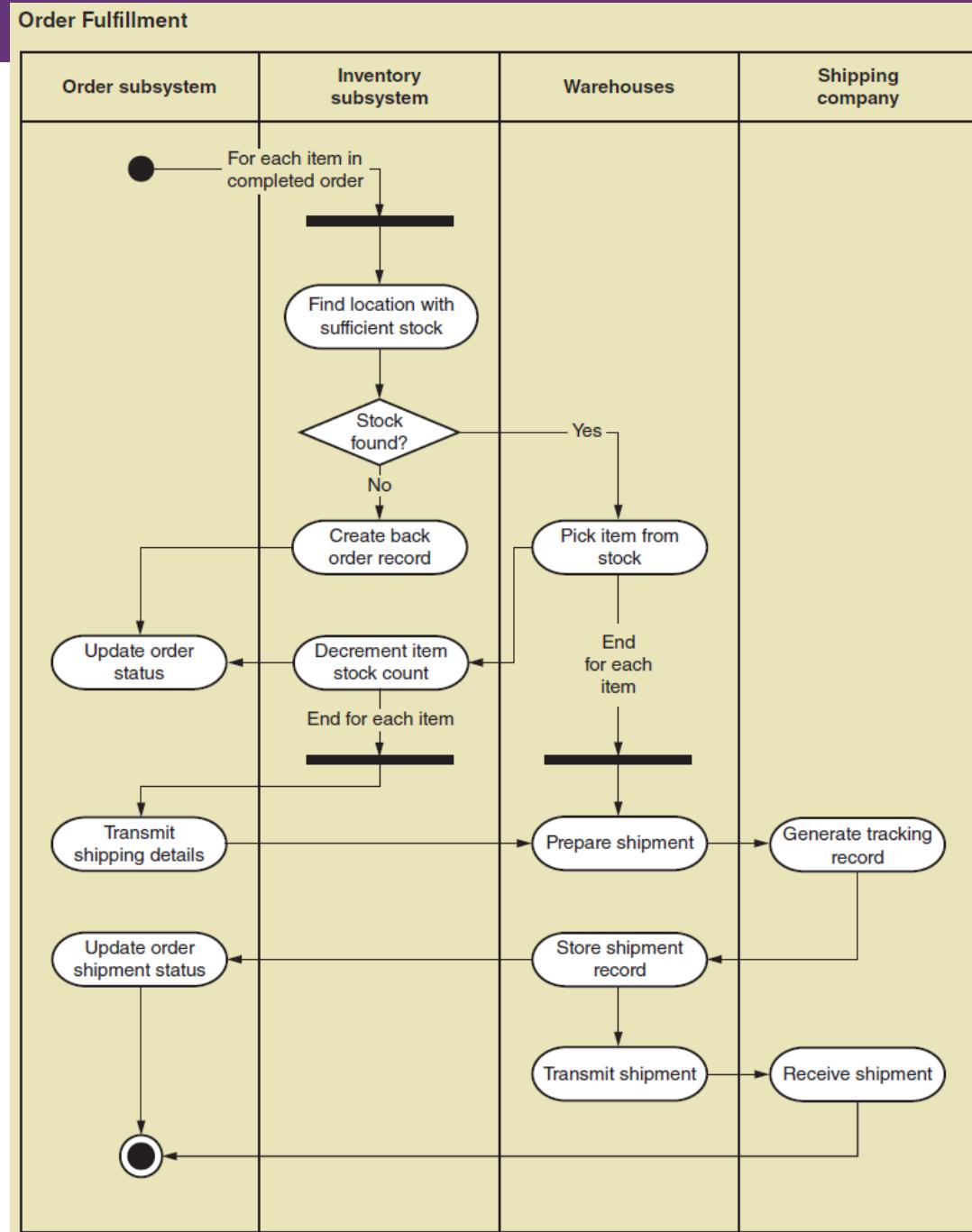
# **Additional examples to help you ...**

# Example: Airline Reservation

This example shows the process of reserving a flight. First, you enter the dates. Once you submit your desired flight plan, you can enter your personal information and at the same time the system could be searching availability. The system flow then joins back into one and you can select the specific flight on the dates you want to fly. This activity diagram gives you two different paths dependent on whether you are using reward points. After entering payment information, the system performs two processes at the same time and then sends out a confirmation email.



# Example from Text: Activity Diagram for Order Fulfillment



# **Workshop Preparation**

- Watch Seminar 4

- Review any resources

## **■ Assignment 1 Interview preparation**

- Meet with your team regularly to prepare to complete all the requirements for Assignment 1
- Be prepared for your first interview with your client.

**Thanks for watching  
See you next week**

# Resources:

## Prescribed text:

- Satzinger, J. W., Jackson, R.B., and Burd, S.D.(2016) Systems Analysis and Design in a Changing World, 7th Edition, Cengage Learning, Chapters 2 (pp. 58-63) & Chapter 3 (pp. 71-73)

## Resources:

- User Stories

Videos - <http://vimeo.com/43601248>

<http://www.agilenutshell.com/episodes/2-userstories>

Article - <https://help.rallydev.com/writing-great-user-story>