



JURUSAN TEKNOLOGI INFORMASI

Software Engineering Course
07. Design (Part-2).pptx

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Topics

1. Use Case Specification
2. Activity Diagram



Topic #1: Use Case Specification

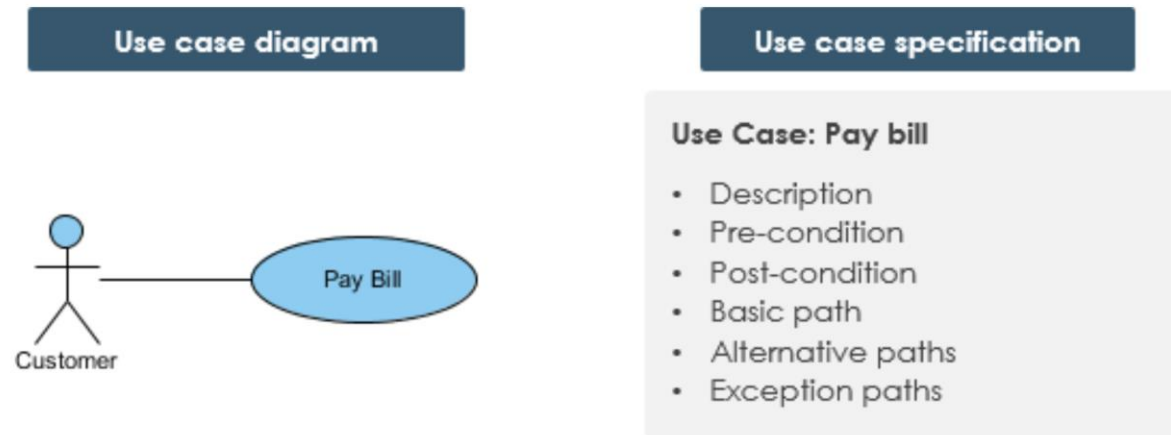
1. Use Case Specification

- Just showing the use case diagram in UML notation is **not enough**.
 - It's just too simple!
- **Use Case Specification** → Text accompanies each use case explaining:
 - The **purpose** of the use case as well as
 - What **functionality** is accomplished when a use case is executed.
- The use case specification is typically created in **analysis and design** phase in an iterative manner.
 - At first, only a **brief description** of the steps needed to carry out the normal flow of the use case (i.e., what functionality is provided by the use case) is written.
 - As analysis progresses, the steps are fleshed out to **add more detail**.
 - Finally, the **exceptional flows** are added to the use case
- Each project can adopt a **standard use case template** for the creation of the use case specification.

1. Use Case Specification

Use Case vs Use Case Specification

- A Use Case describes a task that is performed by an actor yielding a result of business value for a business.
- A use case may be visualized as a use case diagram or/and in structured textual specification format:

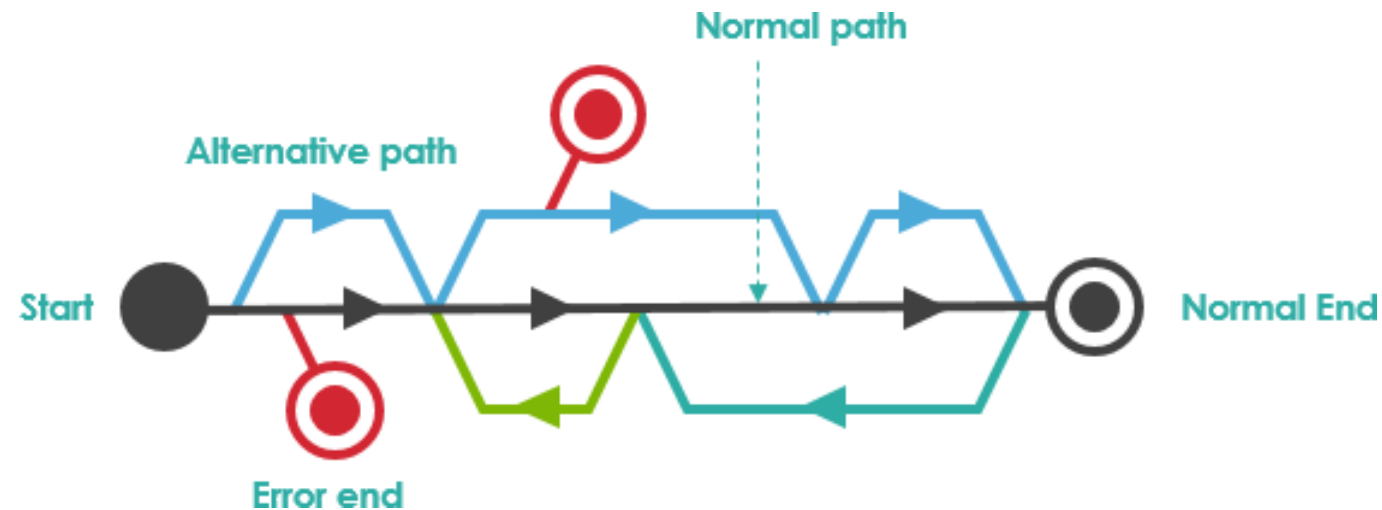


- Use Case (task - *a customer want to perform*) may be:
 - **Interactive** → A system use case describes an actor's interaction with a system in pursuit of the defined business goal
 - **Manual** → A sequence of actions performed by an actor
 - **Automated** → A sequence of steps performed by a program or script

1. Use Case Specification

Characteristics of Use Cases (1/2)

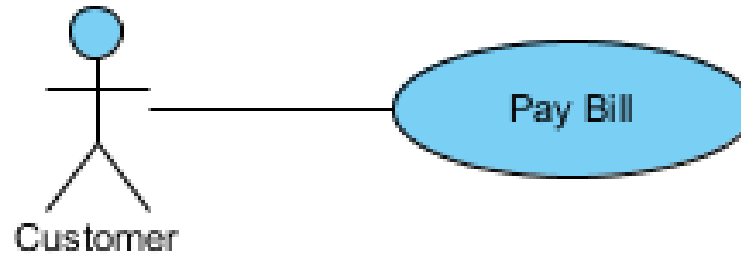
- A use case has:
 - Only one goal
 - A single starting point
 - A single ending point
 - Multiple paths for getting from start to finish
 - i.e. Specify behavior for a variety of possible conditions
 - Each conditions may require specific action(s)



1. Use Case Specification

Characteristics of Use Cases (2/2)

- For Example: “Customer pays bill”:

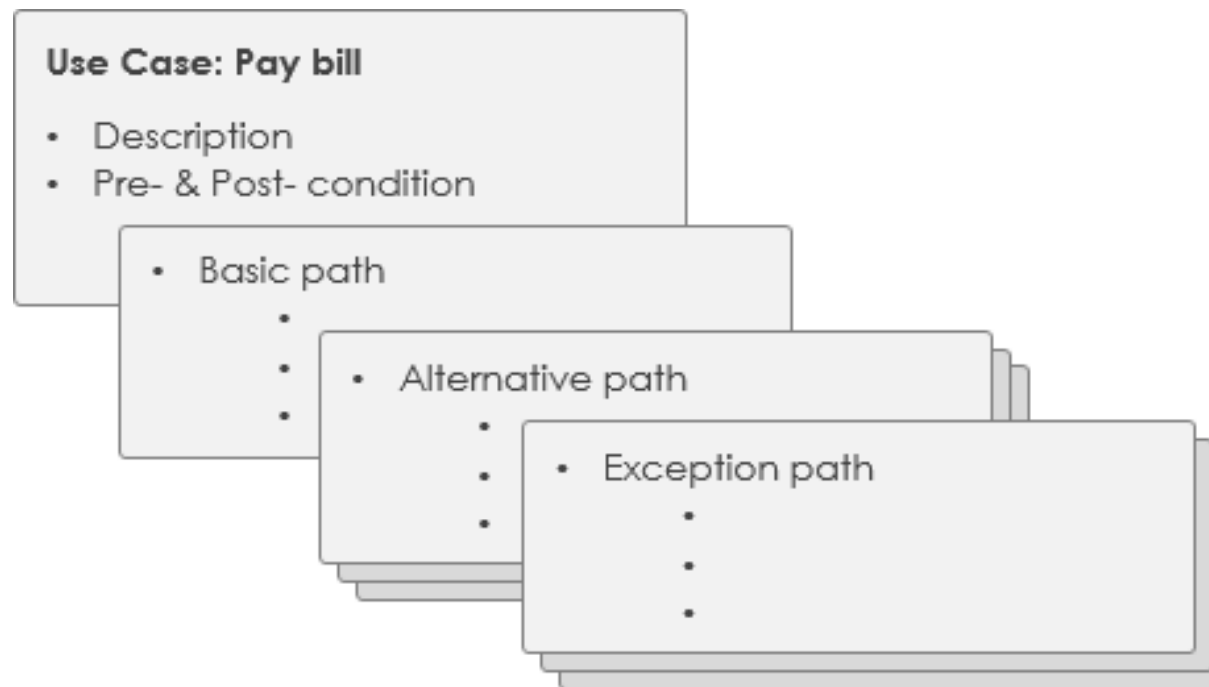


- There are multiple paths to **achieve the goal**:
 - Telephone payment
 - By mail
 - In person
 - by check
 - by cash, etc.
- A path that **does not lead to the goal**:
 - Credit card is **declined**

1. Use Case Specification

A Detailed Use Case Specification

- The detailed use case → A textual representation illustrating a **sequence of events** together with **other related use case information** in **certain format**.
 - People typically adopt a **standard use case template** for recording the detailed information for the use cases.



1. Use Case Specification

Use Case Template

- As mentioned before, there are different notation styles for use cases.
 - Diagram style of Unified Modeling Language (UML)
 - Textual format.
- Whatever notation is used should be easy to understand.
- We can use templates, e.g. Alistair Cockburn.
 - But it is also an option to use what fits best for the project team.
- Whatever template we wish to use, it must be **standard** and **consistent**.

1. Use Case Specification

Use Case Template Example (1/3)

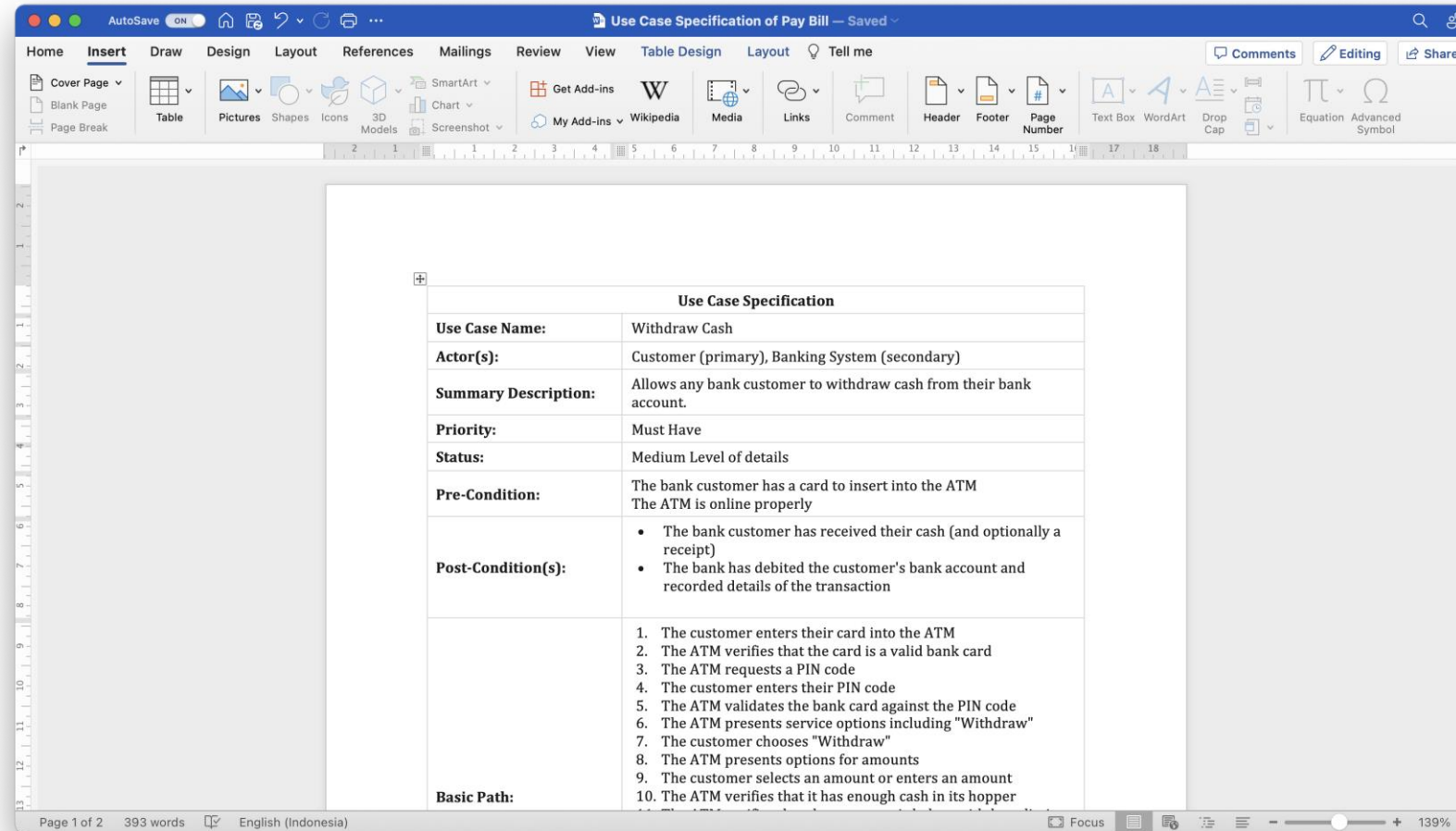


Figure: Use Case Specification Template Created in Microsoft Word (1/3)

1. Use Case Specification

Use Case Template Example (2/3)

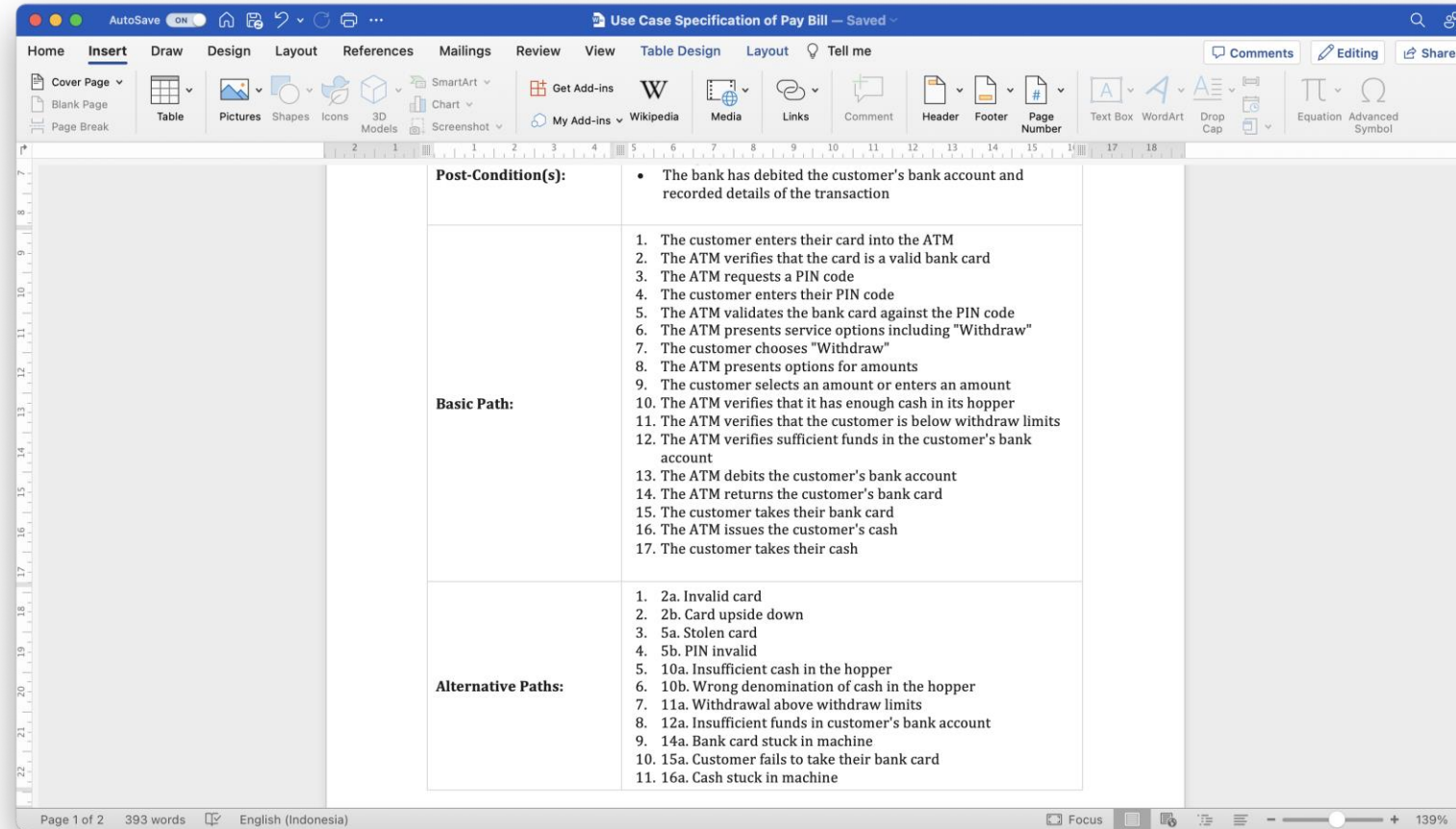


Figure: Use Case Specification Template Created in Microsoft Word (2/3)

1. Use Case Specification

Use Case Template Example (3/3)

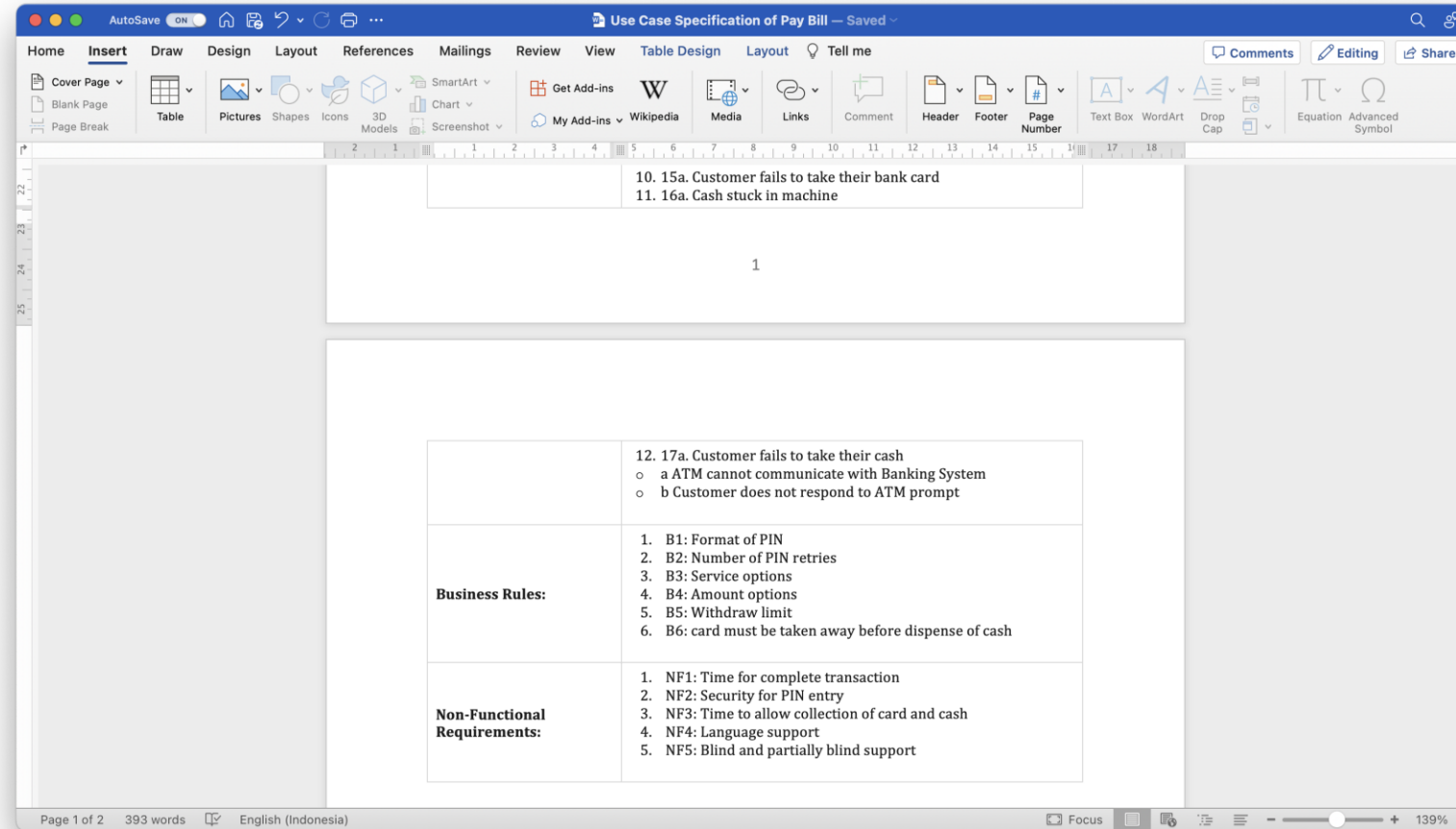


Figure: Use Case Specification Template Created in Microsoft Word (3/3)

Topic #2: Activity Diagram



2. Activity Diagram

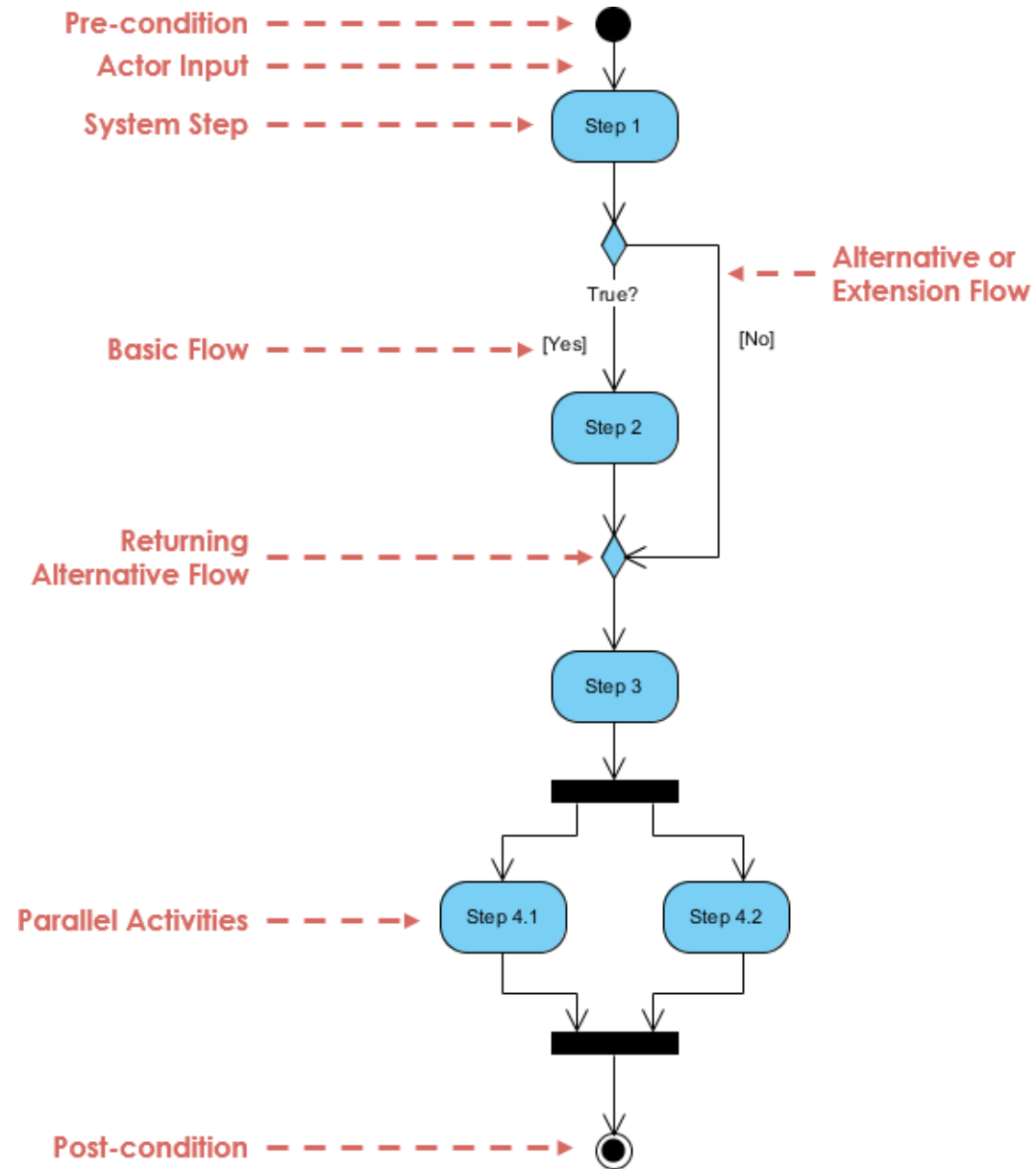
- A use case can be achieved by completing one or more operations (activities).
- It is possible that **an operation is needed** in order to **achieve other use cases**.
 - Across use cases activities may **overlap** and **require coordination**.
 - Events in a single use case can also **relate** to one another.
- Activity Diagrams describe **how activities are coordinated** to provide a service.
 - The coordination can be different at different levels of abstraction.
- It is also suitable for modeling **how a collection of use cases coordinate** to represent business workflows

2. Activity Diagram

Requirements Capturing to Design Transition

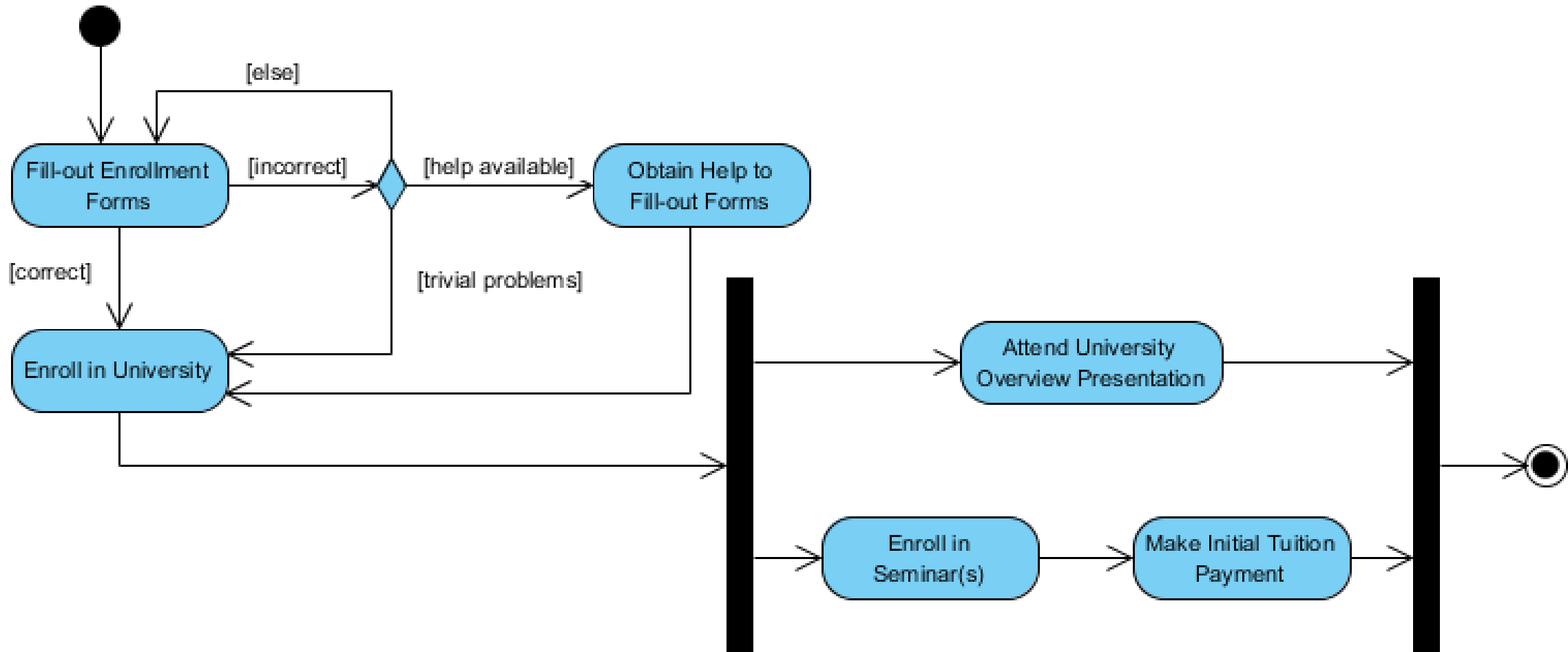
1. Identify **candidate use cases**, through the examination of business workflows.
2. Identify pre- and post-conditions (the context) for use cases.
3. Model workflows between/within use cases.
4. Model complex workflows in operations on objects.
5. Model in detail complex activities in a high-level activity Diagram.

2. Activity Diagram Symbols



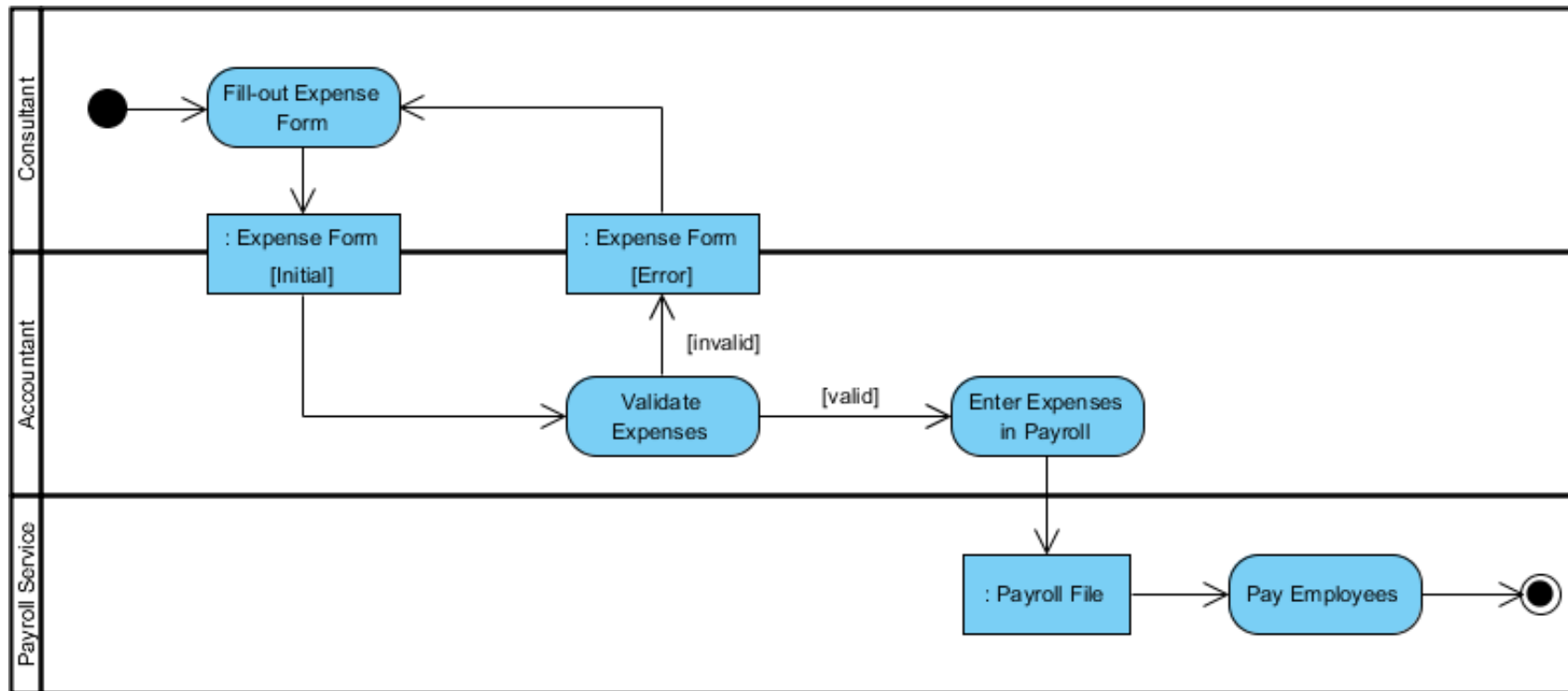
2. Activity Diagram

Example – University Enrollment



2. Activity Diagram Swimlane

- A swimlane is a way to:
 - Group activities performed by the **same actor** on an activity diagram
 - Group activities in a single thread.



Questions?



Thank You

Task



- Create one Use Case Specification and one Activity diagram for one ellipse of the previous meetings' Use Case Diagram!
- Classroom Code: **6axztdt**

References

- [1] https://www.tutorialspoint.com/software_engineering/software_design_basics.htm
- [2] https://www.reqview.com/papers/ReqView-Example_Software_Requirements_Specification_SRS_Document.pdf
- [3] <https://jameskle.com/writes/divide-and-conquer>