

SEEM3430 – Tutorial 1

use case

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Outline

What is use case ?

How to do use case analysis?

- Use case diagram

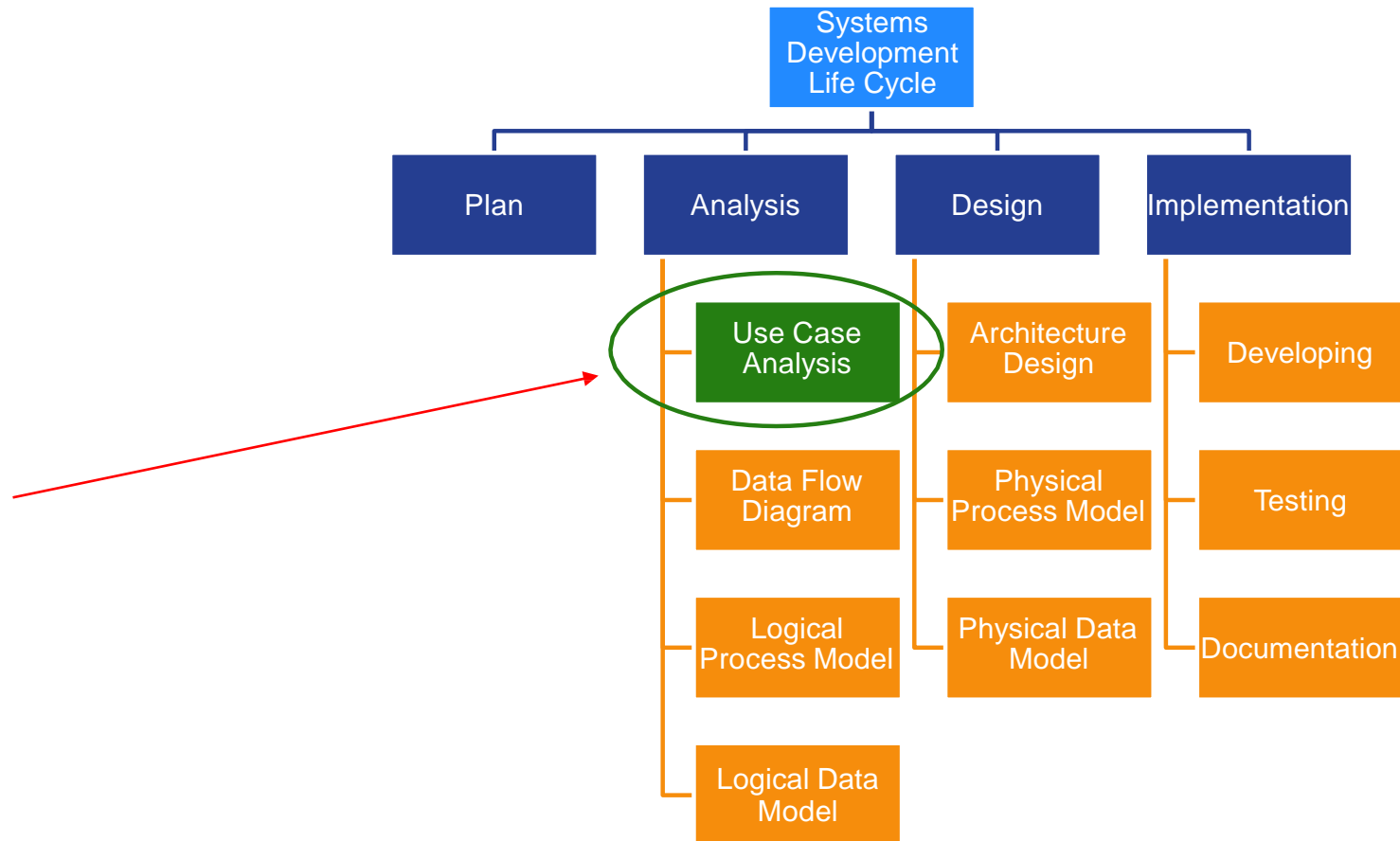
- Identify use case

- Write a use case

Conclusion

Questions for Assignment 1

Big Picture



Use Case

A use case represents how a system interacts with its environment by illustrating the **activities** that are performed by the **users** and the system's **responses**.

Use Case

A use case represents how a system interacts with its environment by illustrating the **activities** that are performed by the **users** and the system's **responses**.

- Use cases are a means of expressing user requirements.
- Use cases are used extensively in the analysis phase.

Two kinds of use case techniques

1. Visual Modeling

Use case diagram: typically used in conjunction with the textual use case .

2. Textual Document

Templates

Note:

While a use case itself might drill into a lot of detail about every possibility, a use - case diagram can help provide a higher - level view of the system.



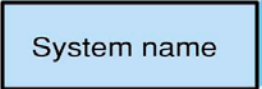

It has been said before that "Use case diagrams are the blueprints for your system". They provide the simplified and graphical representation of what the system must actually do .

Use Case Diagram

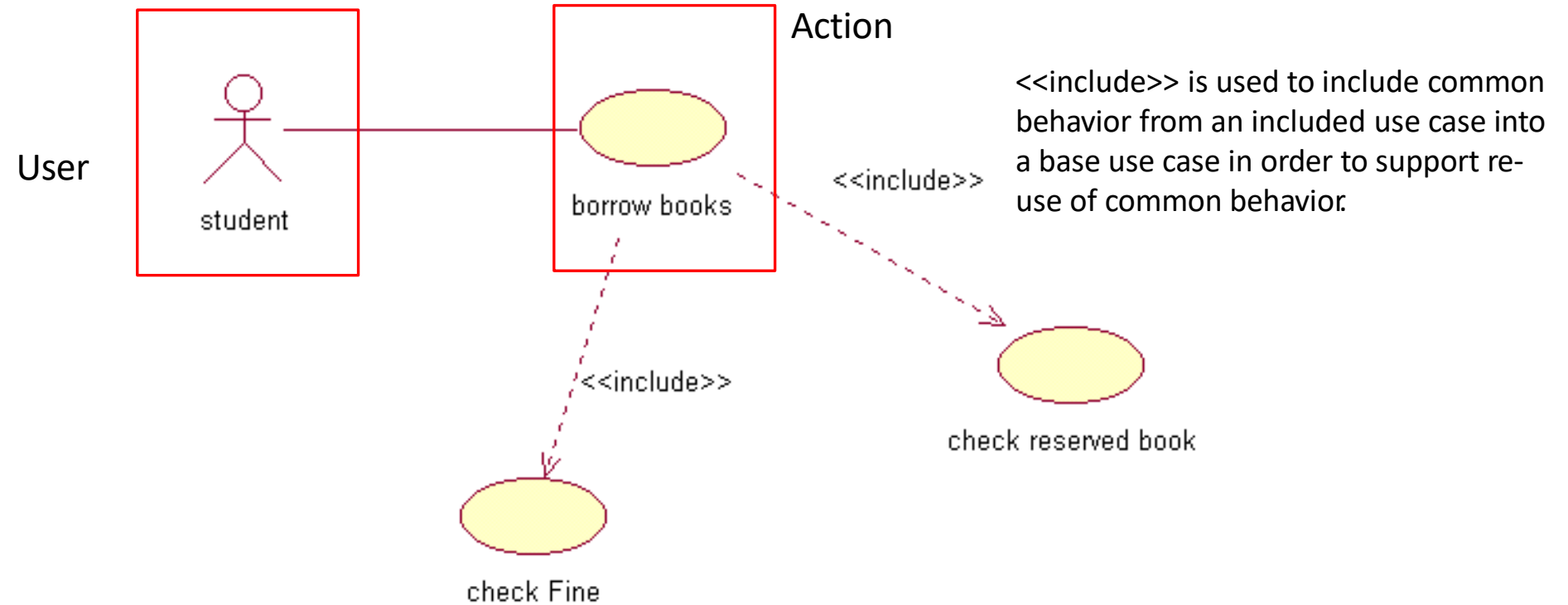
A use-case diagram is used to graphically depict a subset of the use-case model to simplify communications.

Much of the use-case model is in fact textual, with the text captured in the use-case specifications that are associated with each use-case model element. These specifications describe the flow of events of the use case.

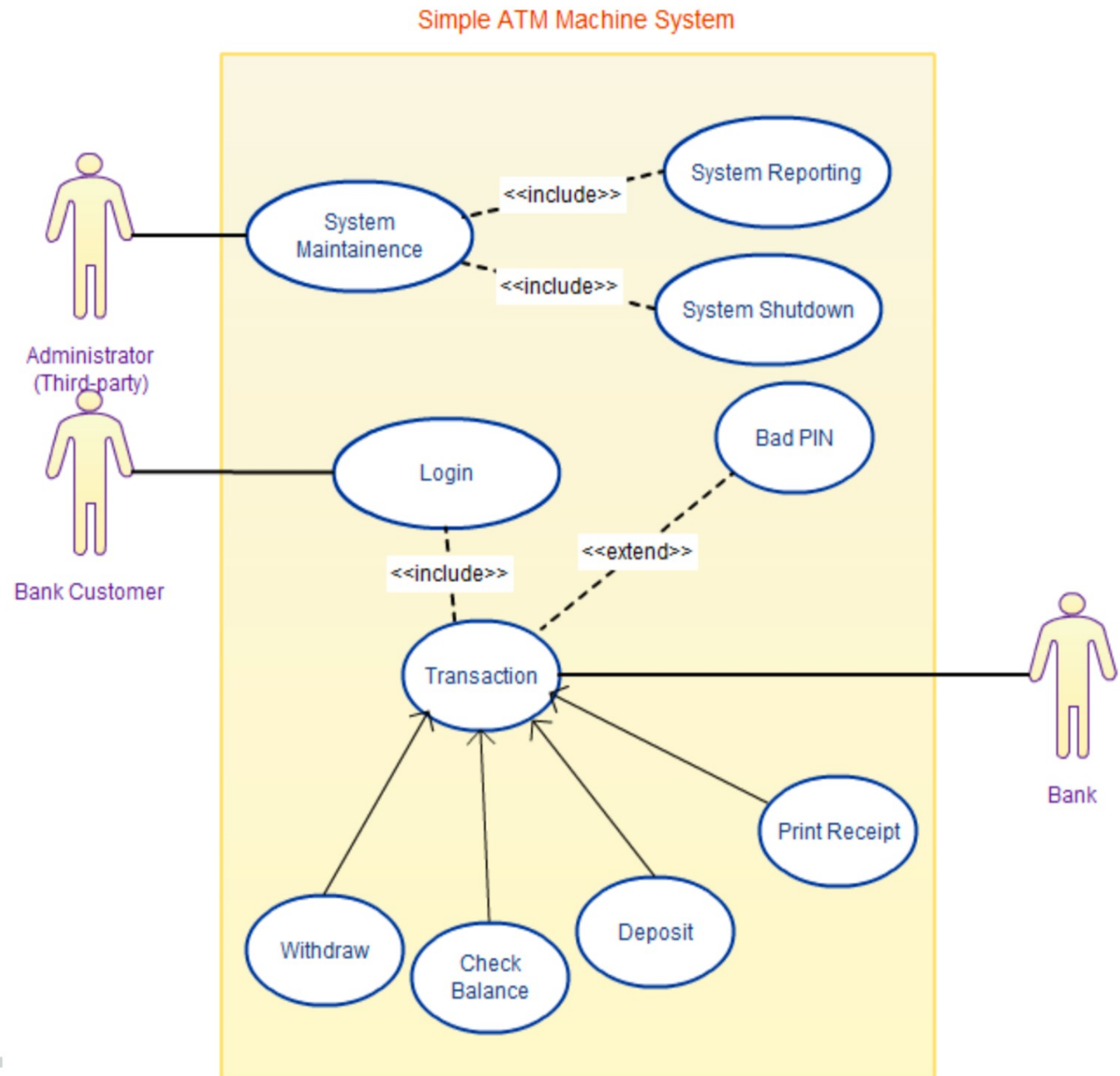
Textual and Symbol

| Term and Definition | Symbol |
|--|--|
| <p>An actor</p> <ul style="list-style-type: none">■ Is a person or system that derives benefit from and is external to the system.■ Is labeled with its role.■ Can be associated with other actors by a specialization/superclass association, denoted by an arrow with a hollow arrowhead.■ Is placed outside the system boundary. |  <p>Actor role name</p> |
| <p>A use case</p> <ul style="list-style-type: none">■ Represents a major piece of system functionality.■ Can extend another use case.■ Can use another use case.■ Is placed inside the system boundary.■ Is labeled with a descriptive verb–noun phrase. |  <p>Use case name</p> |
| <p>A system boundary</p> <ul style="list-style-type: none">■ Includes the name of the system inside or on top.■ Represents the scope of the system. |  <p>System name</p> |
| <p>An association relationship</p> <ul style="list-style-type: none">■ Links an actor with the use case(s) with which it interacts. |  |

Relation representation



Example



Written form use case

1. Identify use case
2. Main parts in template
3. Main steps writing a use case
4. Tips

How to identify use cases?

There are two ways to identify Use Cases :

- Using the actors
 - identify the actors related to a system or organization
 - for each actor, identify the processes it participates in
- Using events
 - identify the external events that a system must respond to
 - relate the events to actors and use cases

Main Parts of a template

1. Preconditions

2. Normal Course

3. Alternative Courses

4. Postconditions

5. Exceptions

6. Summary

| | | | |
|--|---------------------------------|--------------------------------|----------------------------|
| Use Case Name: Request a chemical | | ID: UC-2 | Priority: High |
| Actor: Lawn Chemical Applicator (LCA) | | | |
| Description: The Lawn Chemical Applicator (LCA) specifies the lawn chemical needed for a job by entering its name or ID number. The system satisfies the request by reserving the quantity requested or the quantity available and notifying the Chemical Supply Warehouse of the pick-up. | | | |
| Trigger: A Lawn Chemical Applicator (LCA) needs a chemical for a job. | | | |
| Type: <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal | | | |
| Preconditions: <ul style="list-style-type: none">1. The LCA identity is authenticated.2. The LCA has necessary training and credentials on file.3. The Chemical Supply datastore is up-to-date and on-line. | | | |
| Normal Course: | | Information for Steps: | |
| 1.0 Request a lawn chemical from the chemical supply warehouse. | | | |
| 1. The LCA specifies the desired lawn chemical | ← | Chemical name or ID | |
| 2. The system verifies the chemical is approved for usage | ← | List of approved chemicals | |
| 3. The system displays the quantity of the lawn chemical on hand | ← | Quantity on hand | |
| 4. The LCA specifies the quantity needed | ← | Quantity needed | |
| 5. The system asks the LCA to confirm the request for the quantity needed or the quantity available (Alternative Course 1.1) | ← | Request confirmation | |
| 6. The system gives the LCA a Chemical Pick-up Authorization for the quantity requested | → | Chemical Pick-up Authorization | |
| 7. The system notifies the Chemical Supply Warehouse of the chemical pick-up | → | Chemical Pick-up Notice | |
| 8. The system stores the Lawn Chemical Request in the Chemical Request datastore | → | Lawn Chemical Request | |
| Alternative Courses: | | | |
| 1.1 Quantity available is less than quantity needed (branch at step 5) | | | |
| 1. The system asks the LCA if he wants the quantity available or to cancel the request | | | |
| 2a. The LCA asks to take the quantity available | ← | Request quantity available | |
| 3a. The system changes the quantity requested to the quantity available | | | |
| 4a. The system gives the LCA a Chemical Pick-up-Authorization for the quantity available | → | Chemical Pick-up Authorization | |
| 5a. The system notifies the Chemical Supply Warehouse of the chemical pick-up | → | Chemical Pick-up Notice | |
| 6a. The system stores the Lawn Chemical Request in the Chemical Management System | → | Lawn Chemical Request | |
| 7a. The system notifies Purchasing of the chemical outage | → | Chemical Outage Notice | |
| 2b. The LCA asks to cancel the request | ← | Cancellation | |
| 3b. The system terminates the use case | | | |
| Postconditions: <ul style="list-style-type: none">1. The Lawn Chemical Request is stored in the Chemical Management System.2. The Chemical Pick-up Authorization is produced for the LCA.3. The Chemical Supply Warehouse is notified of the chemical pick-up.4. Purchasing is notified of chemical outage. | | | |
| Exceptions: | | | |
| E1: Chemical is no longer approved for use (occurs at step 2) | | | |
| 1. The system displays message, "That chemical is no longer approved for use" | | | |
| 2. The system asks the LCA if he wants to request another chemical or to exit | | | |
| 3a. The LCA asks to request another chemical | | | |
| 4a. The system starts Normal Course again | | | |
| 3b. The LCA asks to exit | | | |
| 4b. The system terminates the use case | | | |
| Summary | | | |
| Inputs | Source | Outputs | Destination |
| Chemical name or ID | LCA | Chemical Pick-up Authorization | LCA |
| List of approved chemicals | Lawn Chemicals Supply datastore | Chemical Pick-up Notice | Chemical Supply Warehouse |
| Chemical quantity on hand | Lawn Chemicals Supply datastore | | Chemical Request datastore |
| Quantity needed | LCA | | Purchasing |
| Request confirmation | LCA | Lawn Chemical Request | |
| Request quantity available or cancellation | LCA | Chemical Outage Notice | |

Main Parts of a template

1. Preconditions

| | | |
|--|------------------------|----------------|
| Use Case Name: Request a chemical | ID: UC-2 | Priority: High |
| Actor: Lawn Chemical Applicator (LCA) | | |
| Description: The Lawn Chemical Applicator (LCA) specifies the lawn chemical needed for a job by entering its name or ID number. The system satisfies the request by reserving the quantity requested or the quantity available and notifying the Chemical Supply Warehouse of the pick-up. | | |
| Trigger: A Lawn Chemical Applicator (LCA) needs a chemical for a job. | | |
| Type: <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal | | |
| Preconditions: <ol style="list-style-type: none">1. The LCA identity is authenticated.2. The LCA has necessary training and credentials on file.3. The Chemical Supply datastore is up-to-date and on-line. | | |
| Normal Course: <ol style="list-style-type: none">1.0 Request a lawn chemical from the chemical supply warehouse. | Information for Steps: | |

Main Parts of a template

1. Preconditions

2. Normal Course

| | |
|--|----------------------------------|
| 3. The Chemical Supply datastore is up-to-date and on-line. | |
| Normal Course: | Information for Steps: |
| 1.0 Request a lawn chemical from the chemical supply warehouse. | |
| 1. The LCA specifies the desired lawn chemical | ← Chemical name or ID |
| 2. The system verifies the chemical is approved for usage | ← List of approved chemicals |
| 3. The system displays the quantity of the lawn chemical on hand | ← Quantity on hand |
| 4. The LCA specifies the quantity needed | ← Quantity needed |
| 5. The system asks the LCA to confirm the request for the quantity needed or the quantity available (Alternative Course 1.1) | ← Request confirmation |
| 6. The system gives the LCA a Chemical Pick-up Authorization for the quantity requested | → Chemical Pick-up Authorization |
| 7. The system notifies the Chemical Supply Warehouse of the chemical pick-up | → Chemical Pick-up Notice |
| 8. The system stores the Lawn Chemical Request in the Chemical Request datastore | → Lawn Chemical Request |
| Alternative Courses: | |

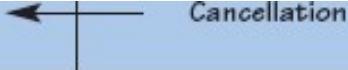
Main Parts of a template

1. Preconditions
2. Normal Course
3. Alternative Courses

| | | |
|--|---|--------------------------------|
| 6. The system gives the LCA a Chemical Pick-up Authorization for the quantity requested | → | Chemical Pick-up Authorization |
| 7. The system notifies the Chemical Supply Warehouse of the chemical pick-up | → | Chemical Pick-up Notice |
| 8. The system stores the Lawn Chemical Request in the Chemical Request datastore | → | Lawn Chemical Request |
| Alternative Courses: | | |
| 1.1 Quantity available is less than quantity needed (branch at step 5) | | |
| 1. The system asks the LCA if he wants the quantity available or to cancel the request | | |
| 2a. The LCA asks to take the quantity available | ← | Request quantity available |
| 3a. The system changes the quantity requested to the quantity available | | |
| 4a. The system gives the LCA a Chemical Pick-up-Authorization for the quantity available | → | Chemical Pick-up Authorization |
| 5a. The system notifies the Chemical Supply Warehouse of the chemical pick-up | → | Chemical Pick-up Notice |
| 6a. The system stores the Lawn Chemical Request in the Chemical Management System | → | Lawn Chemical Request |
| 7a. The system notifies Purchasing of the chemical outage | → | Chemical Outage Notice |
| 2b. The LCA asks to cancel the request | ← | Cancellation |
| 3b. The system terminates the use case | | |
| Postconditions: | | |

Main Parts of a template

1. Preconditions
2. Normal Course
3. Alternative Courses
4. **Postconditions**

| | |
|---|---|
| 2b. The LCA asks to cancel the request 3b. The system terminates the use case |  |
| Postconditions: <ol style="list-style-type: none">1. The Lawn Chemical Request is stored in the Chemical Management System.2. The Chemical Pick-up Authorization is produced for the LCA.3. The Chemical Supply Warehouse is notified of the chemical pick-up.4. Purchasing is notified of chemical outage. | |
| Exceptions: <p>E1: Chemical is no longer approved for use (occurs at step 2)</p> | |

Main Parts of a template

1. Preconditions

2. Normal Course

3. Alternative Courses

4. Postconditions

5. Exceptions

6. Summary

3. The Chemical Supply Warehouse is notified of the chemical pick-up.

4. Purchasing is notified of chemical outage.

Exceptions:

E1: Chemical is no longer approved for use (occurs at step 2)

1. The system displays message. "That chemical is no longer approved for use"

2. The system asks the LCA if he wants to request another chemical or to exit

3a. The LCA asks to request another chemical

4a. The system starts Normal Course again

3b. The LCA asks to exit

4b. The system terminates the use case

Summary

Main Parts of a template

1. Preconditions
2. Normal Course
3. Alternative Courses
4. Postconditions

5. Exceptions

6. Summary

| 4b. The system terminates the use case | | | |
|--|---------------------------------|-------------------------|----------------------------|
| Summary | Source | | Destination |
| Inputs | Outputs | | |
| Chemical name or ID | LCA | Chemical Pick-up | LCA |
| List of approved chemicals | Lawn Chemicals Supply datastore | Authorization | |
| Chemical quantity on hand | Lawn Chemicals Supply datastore | Chemical Pick-up Notice | Chemical Supply Warehouse |
| Quantity needed | LCA | Lawn Chemical Request | Chemical Request datastore |
| Request confirmation | LCA | Chemical Outage Notice | Purchasing |
| Request quantity available or cancellation | LCA | | |

Alternative form use case

Major parts:

1. Preconditions
2. Normal course
3. Postconditions
4. Exceptions

| | | |
|--|----------|----------------|
| Use Case Name: Request a chemical | ID: UC-2 | Priority: High |
| Actor: Lawn Chemical Applicator (LCA) | | |
| Description: The Lawn Chemical Applicator (LCA) specifies the lawn chemical needed for a job by entering its name or ID number. The system satisfies the request by reserving the quantity requested or the quantity available and notifying the Chemical Supply Warehouse of the pick-up. | | |
| Trigger: A Lawn Chemical Applicator (LCA) needs a chemical for a job. | | |
| Type: <input checked="" type="checkbox"/> External <input type="checkbox"/> Temporal | | |
| Preconditions: <ol style="list-style-type: none">1. The LCA identity is authenticated.2. The LCA has necessary training and credentials on file.3. The Chemical Supply datastore is up-to-date and on-line. | | |
| Normal Course: <ol style="list-style-type: none">1.0 Request a lawn chemical from the chemical supply warehouse.<ol style="list-style-type: none">1. The LCA specifies a chemical needed and the quantity needed2. The system lists chemical and quantity on hand from Chemical Supply datastore<ol style="list-style-type: none">a. If the quantity on hand is less than the quantity needed, the LCA specifies the quantity he will takeb. Purchasing is notified of chemical shortage3. The system gives the LCA a Chemical Pick-up Authorization for the quantity requested4. The system notifies the Chemical Supply Warehouse of the chemical pick-up5. The system stores the Lawn Chemical Request in the Chemical Request datastore | | |
| Postconditions: <ol style="list-style-type: none">1. The Lawn Chemical Request is stored in the Chemical Management System.2. The Chemical Pick-up Authorization is produced for the LCA.3. The Chemical Supply Warehouse is notified of the chemical pick-up.4. Purchasing is notified of chemical outage. | | |
| Exceptions: <ol style="list-style-type: none">E1: Chemical is no longer approved for use (occurs at step 1)<ol style="list-style-type: none">1. The system displays message. "That chemical is no longer approved for use"2. The system asks the LCA if he wants to request another chemical or to exit<ol style="list-style-type: none">3a. The LCA asks to request another chemical4a. The system starts Normal Course again3b. The LCA asks to exit4b. The system terminates the use case | | |

Steps for writing a use case



Final tips

1. Based on a goal.

A use case describes how an actor uses the system to achieve a goal.

2. Complete or not complete.

When an actor has performed the steps in a use case, the goal should be either 100% complete or 0% complete.

3. One person, one place, one time, one event.

Try to write use cases that describe how one actor responds to one event in one place at one time.

4. Six to ten steps.

Try to keep the main success scenario of a use case between six and ten steps. Use cases should make requirements easier to comprehend.

Take away message

A use case contains all the information needed to build one part of a process model, expressed in an informal, simple way .

When writing a use case,

- identify the triggering event,
- develop a list of the major steps,
- identify the input(s) and output(s) for every step,
- have the users role - play the use case to verify.

Questions?

THANK YOU !