

Use Cases in Detail – Extensions

*SAnToS Laboratory
Kansas State University*

Copyright 2011, John Hatcliff. The syllabus and all lectures for this course are copyrighted materials and may not be used in other course settings outside of Kansas State University in their current form or modified form without the express written permission of one of the copyright holders. During this course, students are prohibited from selling notes to or being paid for taking notes by any person or commercial firm without the express written permission of one of the copyright holders.

Extensions

- We follow the practice of starting with a main success scenario that captures the actions that happens when everything “goes right” and “happens in the usual way”.
- We use *extensions* to capture situations where...
 - Conditions/validations are violated
 - System has some kind of failure
 - There are alternative paths of actions that we don't want to expose in the Normal Success Scenario because they are used less frequently and we don't want to clutter up the main idea of the Normal Success Scenario

Objectives

Example

Consider possible alternatives to the Normal Success Scenario in a word processor...

...

4. User has the system save the work so far

...

Extensions:

4a. System auto-detects the need for an intermediate save:

4a1. ...

4b. Save fails:

4b1. ...

Alternative extension – there is an alternate way for the action/ scenario to succeed

Failure/exception extension – something goes wrong that prevents an action step from completing as it should

Example

Consider possible alternatives to another word-processor related scenario...

...

3. The system goes through the document, checking every word against its spelling in the dictionary.
4. The system detects a spell mistake, highlights the word, and presents a choice of alternatives to the user.
5. The user selections one of the choices for replacement. The system replaces the highlighted word with the user's replacement choice.

...

Extensions:

- 4a. The system detects no more misspellings through the end of the document:
 - 4a1. The system notifies the user, terminates the use case.
- 5a. User elects to keep the original spelling:
 - 5a1. The system leaves the word alone and continues.
- 5b. User types in a new spelling not on the list:
 - 5b1. The system revalidates the new spelling, returns to step 3.

Formatting/Notation

We will leverage the numbering scheme to indicate how the extensions link up with the actions in the main body...

...

4. User has the system save the work so far

...

Alternatives for a given action start with the same number as the action, and are distinguished by letters...

Extensions:

4a. System auto-detects the need for an intermediate save:

4a1. ...

4b. Save fails:

4b1. ...

Steps/actions in the extension are numbered (but prefixed with the identifier of the alternative (e.g., 4a)).

Extension Conditions

Extension conditions are the conditions under which the use case follows an alternative path.

...

4. User has the system save the work so far

...

Extensions:

4a. System auto-detects the need for an intermediate save:

4a1. ...

4b. Save fails:

4b1. ...

Conditions for each extension are listed in the first line of the extension.

Formatting/Notation

We will leverage the numbering scheme to indicate how the extensions link up with the actions in the main body...

- ...
2. System creates a transaction to withdraw amount specified by user from account.
- ...

Alternatives for a given action start with the same number as the action, and are distinguished by letters...

Extensions:

- 2a. Insufficient funds are available for withdrawal from account:
 - 2a1. System notifies customer, asks for a new amount.
 - 2a2. Customer enters new amount
 - 2a3. System continues at step 2.

Steps/actions in the extension are numbered (but prefixed with the identifier of the alternative (e.g., 2a)).

Alternatives Applying at Multiple Positions

If an alternative can apply at more than one position, we have several ways of indicating that...

Extensions:

2-5a. User quit suddenly:

2-5a1. ...

...

*a. Network goes down:

*b. User walked away without notice (timeout):

If the condition can occur at several steps, simply list the steps.

If the condition can occur at any time, use an asterisk instead of a step number.

Ending an Extension

Typically, the scenario fragment ends in one of the following four ways...

- The step that branched to the extension has been fixed and replaced. At the end of the extension handling, the situation is as though the step succeeded.
- The system gives the actor another chance. At the end of the extension, the story is back at the beginning of the same step.
- The use case ends because of a total failure.
- The behavior follows a completely different path to success.

Ending an Extension

The step that branched to the extension has been fixed and replaced. .
At the end of the extension handling, the situation is as though the step succeeded.

3. User activates web site URL.

4. ...

Extensions:

3a. No URL available:

3a1. User searches for web-site (interaction continues at 4).

Ending an Extension

The system gives the actor another chance. At the end of the extension, the story is back at the beginning of the same step.

3. User enters password.
4. System validates password.
5. ...

Extensions:

- 4a. Invalid password:
 - 4a1. System notifies user, requests password again.
 - 4a2. User reenters password.
 - ...
- 4b. ...

Ending an Extension

The use case ends in total failure.

3. User enters password.
4. System validates password.
5. ...

Extensions:

...

- 4c. Invalid password entered too many times:
 - 4c1. System notifies user, and terminates user session.

Ending an Extension

The behavior follows a completely different path to success.

3. User does ...
4. User does ...
5. ...

Extensions:

...

- 3a. User runs personal macro to complete processing:
 - 4c1. System notifies user, and terminates user session.

Acknowledgements

- The material in this lecture is based almost entirely on
 - Chapter 8 of *Writing Effective Use Cases*. Alistair Cockburn, Addison-Wesley.