Advanced Use Case Diagrams, Textual Specifications

PB007 Software Engineering I

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In addition to the associations between actors and use cases seen last week, there are further types of relations:

- generalization of actors;
- use case generalization;
- include;
- extend;

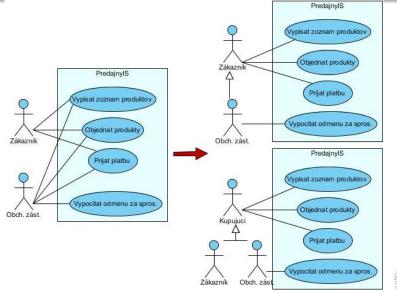


Generalization (inheritance) of actors is the relationship between the more general and specialized actors

- General actors are often abstract, i.e. they do not represent a real role in the system. Descending actors represent instead a specific role;
- A descending actor inherits all roles and parent links;
- Every time it is expected the use of a parent actor, we can use on of the descendants;
- It is generally suitable when multiple actors have a number of common use cases;
- Simplifies the semantics of the diagram;



Actors Generalization - an example



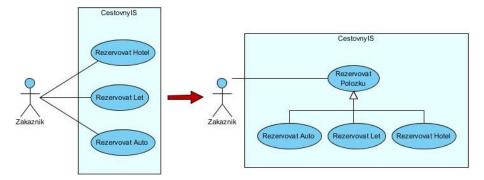


Generalization (inheritance) of use cases is the relationship between the general and specialized use cases;

- A specialized use cases inherits the properties of its parent, and add new features by possibly overloading (changing) the inherited properties;
 Note: it cannot overload the parents' extension points
- The text specifications in the offspring should denote the changes from the parent use case;
- Parental use cases can be abstract (*recommended*), i.e. either no specification or incomplete specification of the flow of events;



Use Case Generalization - an example



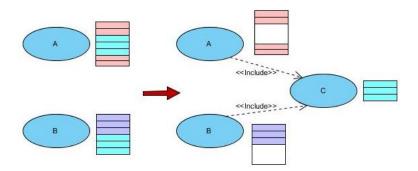


include allows you to allocate repetitive steps in several use cases in a separate use case;

- The basic use case is incomplete without all the embedded use cases;
- Embedded use cases may or may not be comprehensive;
- Be careful about functional decomposition!

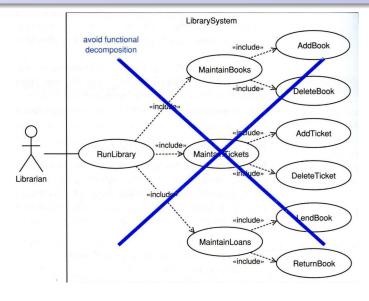


include





include





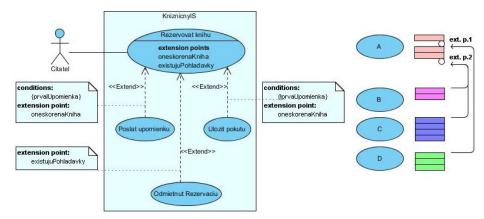
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The relationship extend is a way to add new behavior to existing use cases;

- The basic use case contains within the flow of events the so-called *extension points*;
- The extension use case specifies at which point the extension is attached;
- The basic use case does not know which point of the extension is attached to;
- Extension of use cases can contain several segments and each is designed to point to a different extension use case;
- More extension use cases can share the same extension points. In this case, it is appropriate to establish the conditions that determine which of them should be used in a given situation;



extend





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The textual use case specification should include:

- ID;
- A brief description;
- The primary actors;
- The secondary actors;
- Input conditions;
- The main flow of events;
- Output conditions;
- An alternative flow of events;



Main Flow, Primary Scenario events are a sequence of steps of interaction with the system in the ideal case (that is free from errors, interruptions, etc...);

- They always begin with some action of the primary actor. It is recommended to use the form:
 - 1. The use case begins when <actor><function>.
- The individual steps should be short, precise and understandable. Use the form:

<id step><actor/system><action>

You can use branching flow using keywords IF, FOR, WHILE

The **alternative flow** represents deviations from the main flow due to errors or interruptions. It can also be used to capture more complex branching, such as situations that are not exactly known if and when they will occur:

- http://sce.uhcl.edu/helm/rationalunifiedprocess/ process/artifact/ar_ucmod.htm
- http://www.karonaconsulting.com/downloads/UseCases_ IncludesAndExtends.pdf



- Review the primary use case diagram from the previous exercise. Please correct any errors and consider the use of advanced relationships (include, extend, generalization);
- With a few sentences, document all use cases. This will serve to fully understand the model and select the use cases that will be further specified with the specifications;
- Choose three use cases for which to create a detailed textual documentation in the form of scenarios and event streams. It is appropriate that the use cases are related. The selection must be made by agreement with the instructor. Set the selected cases in VP to use a different colour than the others (e.g. light yellow color);
- Upload the **pdf report** to folder (Week 03).
- Deadline: Monday, 6.10.14 23:59 (Groups 10,11,12)



Reporting Configuration in VP

otions		Details	
Generate table of contents	?	Children	References
Generate table of figures	2	Model-based	References documentation
Generate diagrams	2	C Diagram-based	✓ Sub-diagrams
Image type : SVG	-	Members	Include sub-diagram details
Generate diagram type title		🔽 ERD Column Details	Comments
Generate diagram properties			Sort by Date/Time: Descending 💌
	2	Properties	Tagged values
Generate diagram summary	2	Project management properties	CRM Class Details
Include extra details		Relationships	🔽 Use Case Details
Suppress element with blank documentation in summary table		Quality information	
Generate reference (file/URL) link	2	Anti-aliasing	
Generate model elements/diagrams link	2	Graphics	✓ Text
Skip heading for empty model element section		Font	
Convert multiline model heading to single line			
Show multiline model name		Font: Unspecified <u>•</u>	
Treat HTML content as HTML source			
Suppress details if duplicated			
Table cell keep together with page			
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TF content appearance :			
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