

Knowledge Sharing by Means of Graph-based Diagrams on Web

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Motivation

Community Question Answering systems

- Finding relevant information quickly and efficiently
- Share knowledge with the right audience
- Questions and answers only as unstructured text
- Expressing and understanding ideas is complicated

Confusion in creating UML diagram

I am creating a UML diagram and i am bit confuse where to use <<extend>>, <<use>> and where to use <<include>> in my use case diagram.

Suppose user click on an edit link to modify the details of it so what to use after click event <<use>> or <<extend>>...

Please help me on this .. please also tell the best tool use to create UML diagram. At present I am using Edraw.

Thanks in advance

4 Answers

While modeling your business process through use cases, first of all, you need to go through requirement engineering process [for dynamic design view]. In case of use case diagram, you may use <<extends>> for generalization, alternate scenario of success or failure e.g. receive phone call may extend receive business phone call

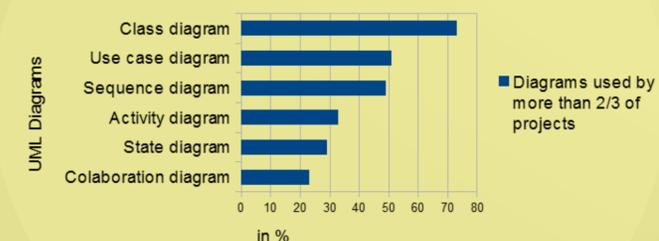
<<uses>> if one scenario requires other related scenario eg. reserve book may use check membership status

CQA system Stack Overflow

Graphical representation

- Language neutral
- Clear explanation
- More efficient finding of solutions
- Helps by estimating the risks
- Software engineering: UML

Frequency of UML diagrams' employment in software projects:



Dobing, B., Parsons, J.: How UML is used. In: Communications of the ACM, (2006), vol. 49, no. 5, pp. 109–113.

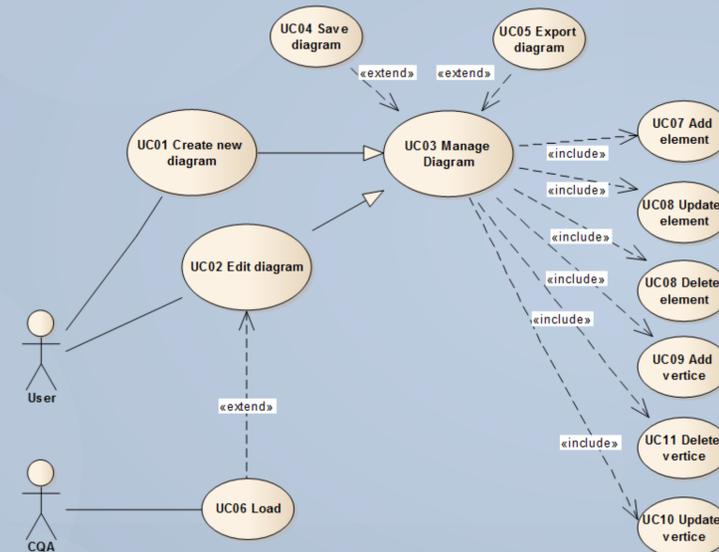
Solution: application cqaGraph

Hypothesis 1: Created application cqaGraph offers required functionality for creating the most common UML diagrams.

Hypothesis 2: Created application cqaGraph offers robust, intuitive and reliable user interface.

Functional requirements

- Support of the most common UML diagrams: class diagram, use case diagram, activity diagram, state diagram;
- Diagram persistency and its static representation (JPG, PNG, PDF)

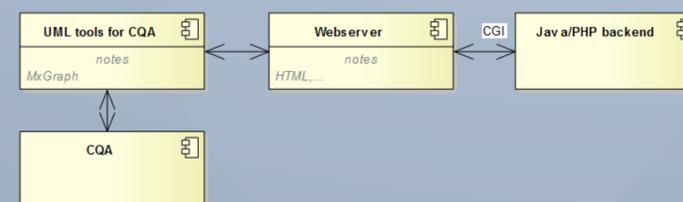


Non-functional requirements

- Intuitive navigation
- Easy to use
- Robust
- Reliable
- Web-based

Architecture of cqaGraph

- Extensive study of graphical libraries: most suitable mxGraph



UX study

- Most suitable graphic library is mxGraph: supports UML diagrams
- However, support of UML diagrams in mxGraph is not sufficient
- UX study to determine the possibilities and restrictions of diagramming library mxGraph
- Specifying users' requirements and expectations

- Qualitative UX study: UX lab, Tobii studio
- Experiment in sample application based on mxGraph

Class Diagram.xml

File Edit View Format Text Arrange Options Help All changes saved

Block Package Object Entity

Note Actor Use Case Start

Activity Composit Condition Fork/Join

End Lifeline Invocation Synchron

Relation Associati Aggregati Composit

More shapes...

UML Diagram: <<Interface>> Student

Student

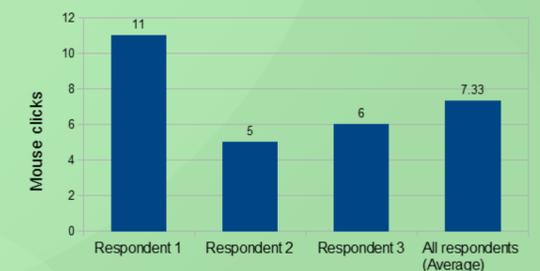
+ grade: Integer

+ average(): float

Sample application used in experiment (www.draw.io)

Experiment

- Instructions to draw certain UML diagrams
- 3 respondents: experienced users of UML
- Feedback from respondents:
 1. Feedback to organization and navigation of application
 2. Feedback to overall transparency and layout
 3. Feedback to unexpected responses of application
- Recording of mouse movements:



Number of clicks necessary to perform desired action

Conclusion

- cqaGraph as an extension to traditional CQA systems
- Questions and answers in unstructured text enriched with graphical representation
- Better understanding of ideas
- More efficient knowledge sharing