

Towards an Understanding of the Practical Use of UML

Masterstudium:
Wirtschaftsinformatik

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PROBLEM STATEMENT

UML is a standardized modeling language, which can be used for a wide variety of purposes. Practical understanding of the usage of UML can be valuable for the following purposes:

- ▶ It can improve the development of UML tools by providing a list of the frequently used UML language concepts. This can lead to time and cost reduction in implementing such tools.
- ▶ Authors of UML literature would know on which parts of UML they can focus their writing.
- ▶ A practical understanding about the UML usage can enhance lectures about UML. Further, a simplified version of UML for teaching and practicing could be developed.
- ▶ It could help in developing a simplified version of the UML metamodel by removing unused or less popular concepts.
- ▶ Studying which elements of UML are used in practice can identify which parts of the UML metamodel need further modifications, or which language concepts need to be extended or may be combined.

Only a few studies about the usage of UML in practice exist, which mostly used surveys. None of these studies analyzes real world models to find out which parts of UML are used.

OBJECTIVE

The aim of this work is a usage analysis of UML by investigating real world models, taking the following artifacts into account:

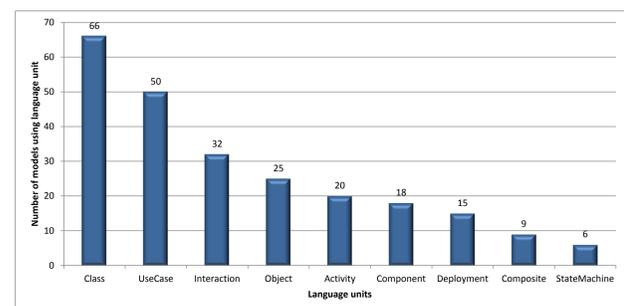
- ▶ UML language units
- ▶ UML language concepts
- ▶ UML diagrams
- ▶ Relationships between different UML language units
- ▶ UML profiles

APPROACH

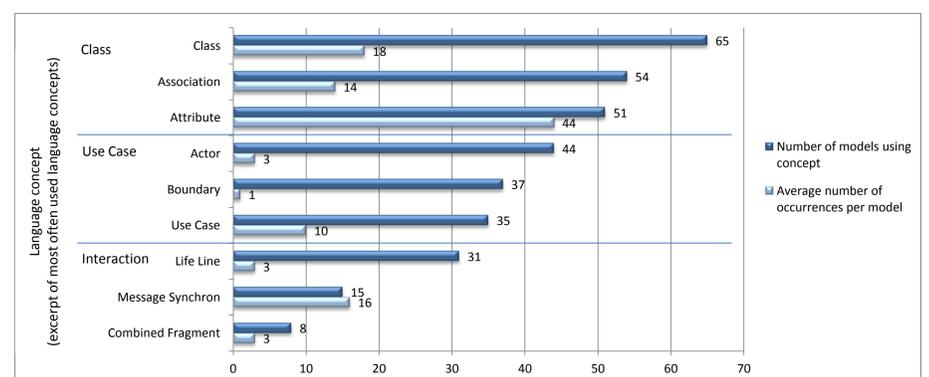
- ▶ Elaboration of metrics
Determination of used UML concepts, statistical measurements, and data mining metrics.
- ▶ Implementation and testing of metrics
The scripting environment of Enterprise Architect (EA) was used for analyzing models.
- ▶ Collection of analyzable UML models
Retrieval of publicly accessible models from the Web, created with EA.
- ▶ Analysis of 92 UML models
Analysis of the models by the implemented program and interpretation of the outcome.

RESULT

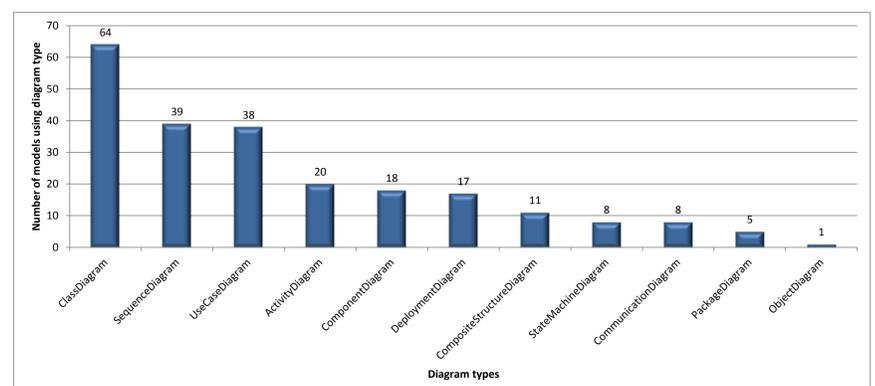
Usage of UML language units



Usage of UML language concepts



Usage of UML diagrams



More results:

- ▶ 61% of the models use stereotypes.
- ▶ Mainly UML concepts of version ≤ 1.4 are used.
- ▶ Few relationships between concepts of different language units are modeled.
- ▶ Reported results of related work conforms to our findings.

CONCLUSION

Implementation of a program which generates reports about the usage of UML in EA models. The following data has been analyzed:

- ▶ The used UML language units and UML concepts
- ▶ The used UML diagrams
- ▶ The content of UML diagrams
- ▶ The usage of UML profiles
- ▶ The used relationships between UML concepts from different UML language units.

Further investigations are highly needed for a more reliable conclusion about the practical use of UML.