

* Required

Instructions and Disclaimer

This questionnaire is part of a scientific experiment conducted by researchers at (...). All data is stored and published in anonymized form.

Participation in the experiment is entirely voluntary. As a small thank you for taking part in our survey, we are giving away an Amazon gift card (€10) to one of the participants. We will ask for your e-mail address and store it to later contact the winner of the gift card.

The goal of this experiment is to compare the understandability of reuse mechanisms for modeling languages. We focus on UML class diagrams, which are commonly used to design a software architecture.

The experiment consists of three parts. The first and third parts are short questionnaires, while the second part contains some questions regarding tasks to be performed with different reuse mechanisms.

This is a link to a handout describing three reuse mechanisms: (...)

Please read the handout before you begin the questionnaire. You are allowed to consult the handout at any time during the experiment. Please make sure you open the handout in a dedicated PDF viewer (Adobe Reader, Preview, ...) as viewing the slides directly in a browser will not provide an optimal reading experience!

In addition to this handout, make sure you have also received a set of paper printouts for the main part of the experiment.

1. Informed Consent *

Check all that apply.

☐ I hereby consent to participate in this experiment. I acknowledge that participation is voluntary and I can leave at any time throughout the experiment.

Participant Background

Please provide some information about yourself and your technical background.

Demographics

2. What is your occupation? *

Mark only one oval.

- ☐ Student (BSc or BEng)
- ☐ Student (MSc)
- ☐ Student (PhD)
- ☐ Academic/Scientist
- ☐ Practitioner

3. Do you have any form of colour blindness?

Mark only one oval.

- ☐ Yes
☐ No

Technical Background

4. How well do you know UML class diagrams? *

A UML class diagram expert is able to create and reason about UML class diagrams, including those with elaborate features such as association classes and generalization of associations.

Mark only one oval.

	1	2	3	4	5	
I can't read UML diagrams at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I'm an expert

5. How well can you program? *

An expert programmer has extensive knowledge about data structures and algorithms, as well as practical experience with most programming paradigms (e.g. imperative, object-oriented, functional, logic programming).

Mark only one oval.

	1	2	3	4	5	
I can't program at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	I'm an expert

6. You have received a set of paper printouts. The first page shows a code word. What is your code word? *

Mark only one oval.

- ☐ Ship
☐ Car
☐ Airplane

7. How much experience do you have with these types of reuse mechanism? *

An expert has actively developed a substantial amount of software with the type of mechanism.

Mark only one oval per row.

	1: None	2: Almost none	3: Some	4: Much	5: Very much
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Task A - Preliminary Assessment

Please assess your understanding of the reuse mechanisms after receiving the instructions.

8. **How do you assess your initial understanding of each mechanism after going through the handout? ***

1 means "I don't understand it at all". 5 means "I understand it very well"

Mark only one oval per row.

	1	2	3	4	5
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. **Checkpoint 1: Please specify the current time. ***

This will tell us how long it takes you to complete each section.

Example: 8:30 AM

Task B (2/3): Mobile Phone Variants

Please find and use the sheet(s) with the label "Mobile Phone" to answer the following questions. Keep in mind that you may consult the handout with instructions at any time.

Questions 1+2: Finding classes and relationships in variants

10. 1: How many variants have both the classes "Camera" and "Video"?

11. 2: How many variants have both the classes "GPS" and "Colour"?

Questions 3+4: Comparing two variants

12. 3: How do variants var4 and var5 differ?

13. 4: How do variants var3 and var2 differ?

Questions 5+6: Comparing all variants

14. 5: Which class is required by all variants?
List all such classes if there are more than one.

15. **6: Which class is required by only one variant? List all such classes if there are more than one.**

16. **Checkpoint 4: Please specify the current time. ***

Example: 8:30 AM

Task B (3/3): Project Management Variants

Please find and use the sheet(s) with the label "Project Management" to answer the following questions. Keep in mind that you may consult the handout with instructions at any time.

Questions 1+2: Finding classes and relationships in variants

17. **1: In which variant(s) can a "Phase" contain other "Phases"?**

18. **2: In which variant(s) is there an association between "Person" and "Activity"?**

Questions 3+4: Comparing two variants

19. **3: How do variants var1 and var2 differ?**

20. **4: Which of the two variants var3 and var5 has more associations?**

Mark only one oval.

- ☐ Variant var3
- ☐ Variant var5
- ☐ Both have the same number of associations
- ☐ I don't know

Questions 5+6: Comparing all variants

21. **5: Which class is required by all variants? List all such classes if there are more than one.**

22. **6: Which class is required by only one variant? List all such classes if there are more than one.**

23. **Checkpoint 5: Please specify the current time. ***

Example: 8:30 AM

Task B (1/3): Simulink Variants

Please find and use the sheet(s) with the label "Simulink" to answer the following questions. Keep in mind that you may consult the handout with instructions at any time.

Questions 1+2: Finding classes and relationships in variants

24. **1: How many variants have both the classes "InPort" and "OutPort"?**

25. **2: Are there any variants that do not have the class "Port"? If yes, which variants?**

Questions 3+4: Comparing two variants

26. **3: How do variants var1 and var6 differ?**

27. **4: How do variants var1 and var4 differ?**

Questions 5+6: Comparing all variants

28. **5: Which class is required by all variants?**
List all such classes if there are more than one.

29. **6: Which class is required by only one variant? List all such classes if there are more than one.**

30. **Checkpoint 2: Please specify the current time. ***

Example: 8:30 AM

Task C - Final Assessment

Please rate the understandability of the mechanisms and the difficulty required to work with each of them. Please also select your personal preferences (if you have any).

Any further comments you might have can be provided in the final free-form text field (Additional Comments).

Understandability

31. **How easy did you find it to understand each mechanism? ***

1 means "very easy", 5 means "very hard"

Mark only one oval per row.

	1	2	3	4	5
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Difficulty

How difficult did you find it to answer the questions for each mechanism?

32. **How difficult was it to answer the questions on "Finding classes and relationships in variants" (Questions 1 and 2) for each mechanism? ***

1 means "very easy", 5 means "very difficult"

Mark only one oval per row.

	1	2	3	4	5
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

33. How difficult was it to answer the questions on "Comparing two variants" (Questions 3 and 4) for each mechanism? *

1 means "very easy", 5 means "very difficult"

Mark only one oval per row.

	1	2	3	4	5
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

34. How difficult was it to answer the questions on "Comparing all variants" (Questions 5 and 6) for each mechanism? *

1 means "very easy", 5 means "very difficult"

Mark only one oval per row.

	1	2	3	4	5
Annotative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Compositional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enumerative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Preferences

35. Which mechanism do you prefer for each of the three tasks (Q = Question)? *

Mark only one oval per row.

	Annotative	Compositional	Enumerative	None
Q1+Q2: Finding classes and relationships in variants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q3+Q4: Comparing two variants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Q5+Q6: Comparing all variants	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

36. Can you explain your subjective preferences (intuitively)?

Additional comments

37. Please let us know if you have any additional comments.

Thank You! You're almost done.

Thank you very much for participating in our study.

We plan to present the results of our study in a research publication. If you are interested in the publication and/or in the €10 Amazon gift card, please specify your e-mail address below so that we can keep you posted. We won't use your e-mail address for any other purposes.

38. Are you interested in the results of the study?

Mark only one oval.

☐ Yes

☐ No

39. Are you interested in winning the Amazon gift card?

Mark only one oval.

☐ Yes

☐ No

40. E-mail address

41. In your opinion, how could we improve this experiment?

Powered by

