Appendix G: Questionnaire after Phase II implementation

Volunteer # \_\_\_005\_\_\_\_

1. The phase 2 changes in the extension part only would have following results on phase 1 implementation?
2. No effect
3. Applications did not run properly
4. Applications throw exceptions
5. Overall to integrate phase 2 application changes into phase 1 changes, you need to make to the following code modifications?
6. No change in implementation was required
7. Need major changes such as creating new classes
8. Need moderate changes such as creating new methods and variables
9. Need minor changes such as modifying few existing methods and variables
10. Overall scattering or tangling increased due to phase 2 application changes
11. None of the above
12. To integrate phase 2 extension changes into phase 1 changes, you need to make the following code modifications?
13. No change in implementation was required
14. Need major changes such as creating new classes
15. Need moderate changes such as creating new methods and variables
16. Need minor changes such as modifying few existing methods and variables
17. Overall scattering or tangling increased due to phase 2 application changes
18. None of the above
19. While implementing the phase 2 features for phase 1 applications, which of the following did you find the most difficult?
20. Adding crosscutting concerns to the applications design
21. Deciding how to share data between previously existing sample application code and new code
22. Debugging the applications with crosscutting concerns
23. Working with the Java implementation language or the IDE
24. Managing the complexity of the application
25. While implementing the phase 2 application changes, which of the following did you find the most difficult?
26. Deciding how to share data between previously existing sample application code and new code
27. Debugging the applications with crosscutting concerns
28. Working with the Java implementation language or the IDE
29. Managing the complexity of the application
30. Which of the following was the most time consuming during implementation of phase 2 feature changes?
31. Understanding the original applications and analyze the new requirements
32. Designing the solutions
33. Implementing the solutions
34. Debugging the solutions
35. Learning the tools (e.g., Java, an IDE)
36. Learning AOP (not applicable for group 1)
37. Learning CommJ (not applicable groups 1 and 2)

1. Which of the following was the most time consuming during implementation of phase 2 application changes?
2. Understanding the original applications and analyze the new requirements
3. Designing the solutions
4. Implementing the solutions
5. Debugging the solutions
6. Learning the tools (e.g., Java, an IDE)
7. While implementing your phase 2 changes in both applications and features, did you come across any of the following situations? (Select all that apply)
8. Your changes introduced new bugs
9. Your changes introduced new dependency among existing application components
10. Tangling and scattering increased
11. None of the above
12. If you were asked to refactor the phase 2 changes so it could be reused by other applications, which of following would you do?
13. Redesign the application’s structure, making major changes in the classes, their relationships, and responsibilities
14. Refactor the code to make minor improvements to the classes, their relationships, or responsibilities
15. Improve the implementation of individual methods, independent of changing the structure of the application, to improve readability or maintainability
16. Nothing – the implementation is ready for reuse
17. In general, in order to implement your applications for phase 2 you made?
18. Major changes
19. Minor changes
20. No different
21. In general, in order to implement your extensions for phase 2 you made?
22. Major changes
23. Minor changes
24. No different
25. Would your application be able to run standalone again if you remove the phase 2 extension changes from sample application code?
26. Yes
27. No
28. Not sure
29. Would your application be able to run standalone again if you remove the phase 2 application changes from sample application code?
30. Yes
31. No
32. Not sure
33. [For CommJ Group] In order to implement the change in requirements for the extension part such that a conversation is no more an RR/OWS/OWR sequence but a MS sequence, what are the following changes you made in your implementation?
34. Need to introduce major changes in the original application code
35. Need to introduce new pointcuts
36. Need to define new data structures to keep track of conversation
37. Lines of Code (LoC) and complexity of sample application may increase
38. Tangling and Scattering of sample application may increase
39. Require only minor change in implementation
40. Only need to modify some rules i.e., state machines etc., to accommodate new conversations
41. May expect some new bugs in the program
42. Overall debugging time would dramatically increase
43. Can reuse existing code to implement new changes
44. [For AspectJ Group] In order to implement the change in requirements for the extension part, what are the following changes you made in your implementation?
45. Need to introduce major changes in the original application code
46. Need to introduce new pointcuts
47. Need to define new data structures to keep track of conversation
48. Lines of Code (LoC) and complexity of sample application may increase
49. Tangling and Scattering of sample application may increase
50. Require only minor change in implementation
51. May expect some new bugs in the program
52. Overall debugging time would dramatically increase
53. Can reuse existing code to implement new changes
54. In order to implement the change in requirements for the application part only what are the following changes you made in your implementation?
55. Need to introduce major changes in the original application code
56. Need to define new data structures to keep track of conversation
57. Lines of Code (LoC) and complexity of sample application may increase
58. Tangling and Scattering of sample application may increase
59. Require only minor change in implementation
60. May expect some new bugs in the program
61. Overall debugging time would dramatically increase
62. Can reuse existing code to implement new changes
63. From scale 1-5, how would you rank the overall application after changes you implemented in Phase2 for code tangling (1 means fully tangled and 5 means two are totally independent)?

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1. From scale 1-5, how would you rank the overall application after changes you implemented in Phase 2 for code scattering (1 means fully scattered in all classes and 5 means no scattering)?

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1. How many hours did you spend to implement phase 2 extension changes?

Around one hour

1. How many hours did you spend to implement phase 2 application changes?

Around 2 hours