

1. Phase 1 post-Implementation Questionnaire

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1. While implementing the initial version of changes for sample applications, which of the following did you find the most difficult?
 - a. Adding additional requirements for the extension part to applications design
 - b. Deciding how to share data between previously existing sample application code and new code
 - ☒ c. Debugging the applications with crosscutting concerns
 - d. Working with the Java implementation language or the IDE
 - e. Managing the complexity of the application

2. Which of the following was the most time consuming activity during Phase 1?
 - a. Understanding the original applications and analyze the new requirements
 - b. Designing the solutions
 - c. Implementing the solutions
 - ☒ d. Debugging the solutions
 - e. Learning the tools (e.g., Java, an IDE)
 - f. Learning AOP (not applicable for group 1)
 - g. Learning CommJ (not applicable groups 1 and 2)

3. While implementing your changes, did your come across any of the following situations?
(Select all that apply)
 - ☒ a. Your changes introduced new bugs
 - b. Your changes introduced new dependency among existing application components

- c. Tangling and scattering increased
 - d. None of the above
4. If you were asked to refactor the changes related to the extension part so it could be reused by other applications, which of following would you do?
- a. Redesign the application's structure, making major changes in the classes, their relationships, and responsibilities
 - b. Refactor the code to make minor improvements to the classes, their relationships, or responsibilities
 - ☒ c. Improve the implementation of individual methods, independent of changing the structure of the application, to improve readability or maintainability
 - d. Nothing – the implementation is ready for reuse
5. How would you rank your application, so that it would work again if you separate the extension related code files in Phase1 from sample application code?
- ☒ a. Very easy change, the two parts are almost oblivious
 - b. A little difficult as there are some extension related references exists in the original application
 - c. A significant effort is required as some extension related code snippets is tangled and scattered in the original application code or vice versa
6. Suppose your original application (such as Edit-Distance Calculator and FTP) were implemented using connect-less communications. To implement this feature would your changes be?

- a. Considerably different
 - b. Somewhat different
 - c. A little different
 - ☒ d. No different
7. Suppose your original application (WeatherStationSimulator) were implemented using connect-less communications. To implement this feature would your changes be?
- e. Considerably different
 - f. Somewhat different
 - g. A little different
 - ☒ h. No different
8. If the original application of WeatherStationSimulator were implemented in such a way so that the Transmitters in the original application, send data readings to multiple Receivers. To implement this feature would your changes be?
- a. Considerably different
 - b. Somewhat different
 - c. A little different
 - d. No different
9. If the original application were implemented using JDK Sockets rather than JDK Channels. To implement this feature would your changes be?
- a. Considerably different
 - b. Somewhat different
 - c. A little different

☒ d. No different

10. To implement the extension, what are the following changes you made in your original application?

- a. Need to introduce major changes in the original application code
- b. Need to introduce new pointcuts
- c. Need to define new data structures to keep track of conversation
- d. Lines of Code (LoC) and complexity of sample application may increase
- e. Tangling and Scattering of sample application may increase
- ☒ f. Require only minor change in implementation
- ☒ g. Only need to modify some rules i.e., state machines etc., to accommodate new conversations
- h. May expect some new bugs in the program
- i. Overall debugging time would dramatically increase
- j. Can reuse existing code to implement new changes

11. [For CommJ Group] Suppose if we change the requirements for the extension such that a conversation is not only RR/OWS/OWR sequence but also a MS conversation, what are the following changes you can expect in your implementation?

- a. Need to introduce major changes in the original application code
- b. Need to introduce new pointcuts
- c. Need to define new data structures to keep track of conversation
- d. Lines of Code (LoC) and complexity of sample application may increase
- e. Tangling and Scattering of sample application may increase
- f. Require only minor change in implementation

- g. Only need to modify some rules i.e., state machines etc., to accommodate new conversations
- h. May expect some new bugs in the program
- i. Overall debugging time would dramatically increase
- j. Can reuse existing code to implement new changes

12. From scale 1-5, how would you rank the overall application after changes you implemented in Phase1 for code tangling (1 means fully tangled and 5 means two are totally independent)?

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

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