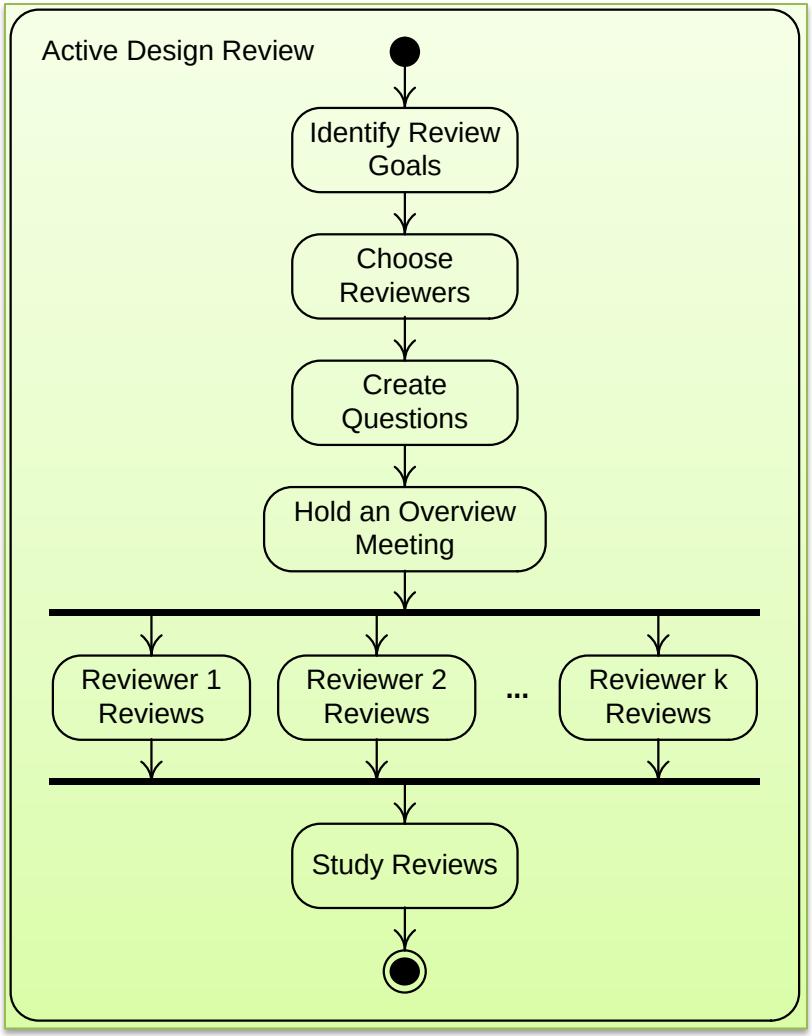
The ADR

Active Design Review

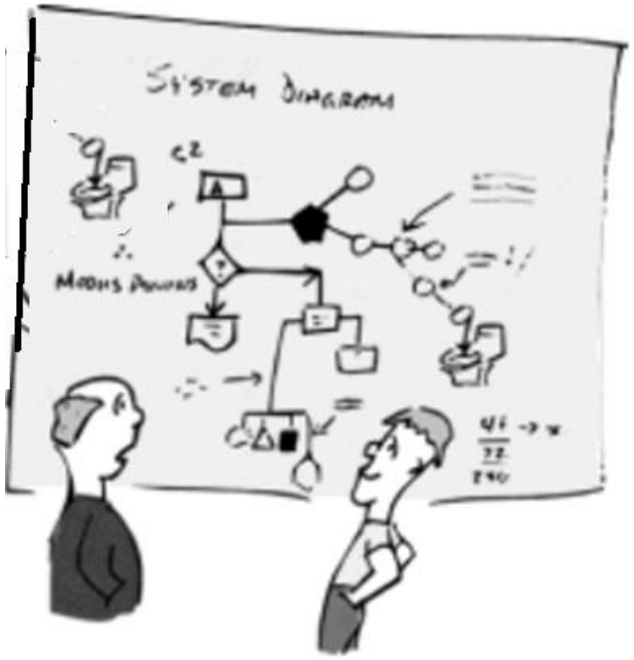
An Approach to Architecture Assessment

Active Design Review Process



Active Design Review

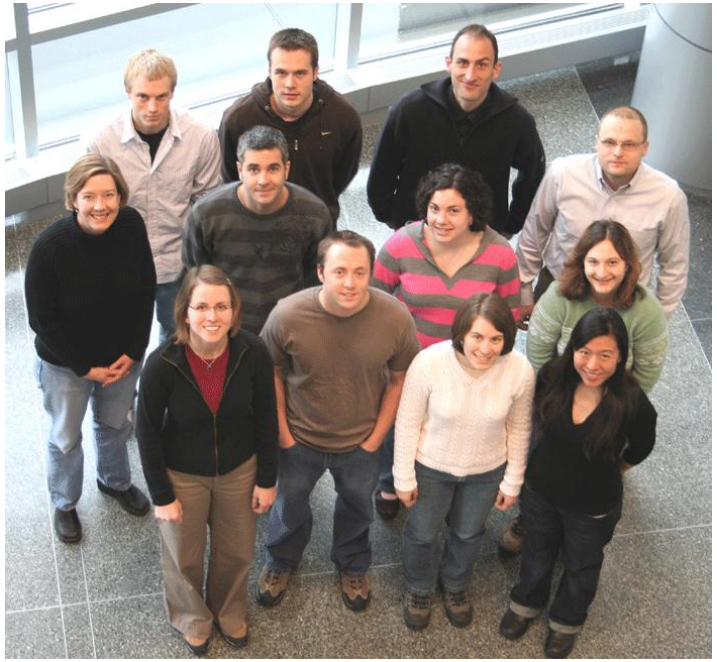
Identify Review Goals



Designers choose aspects of the design they want checked.

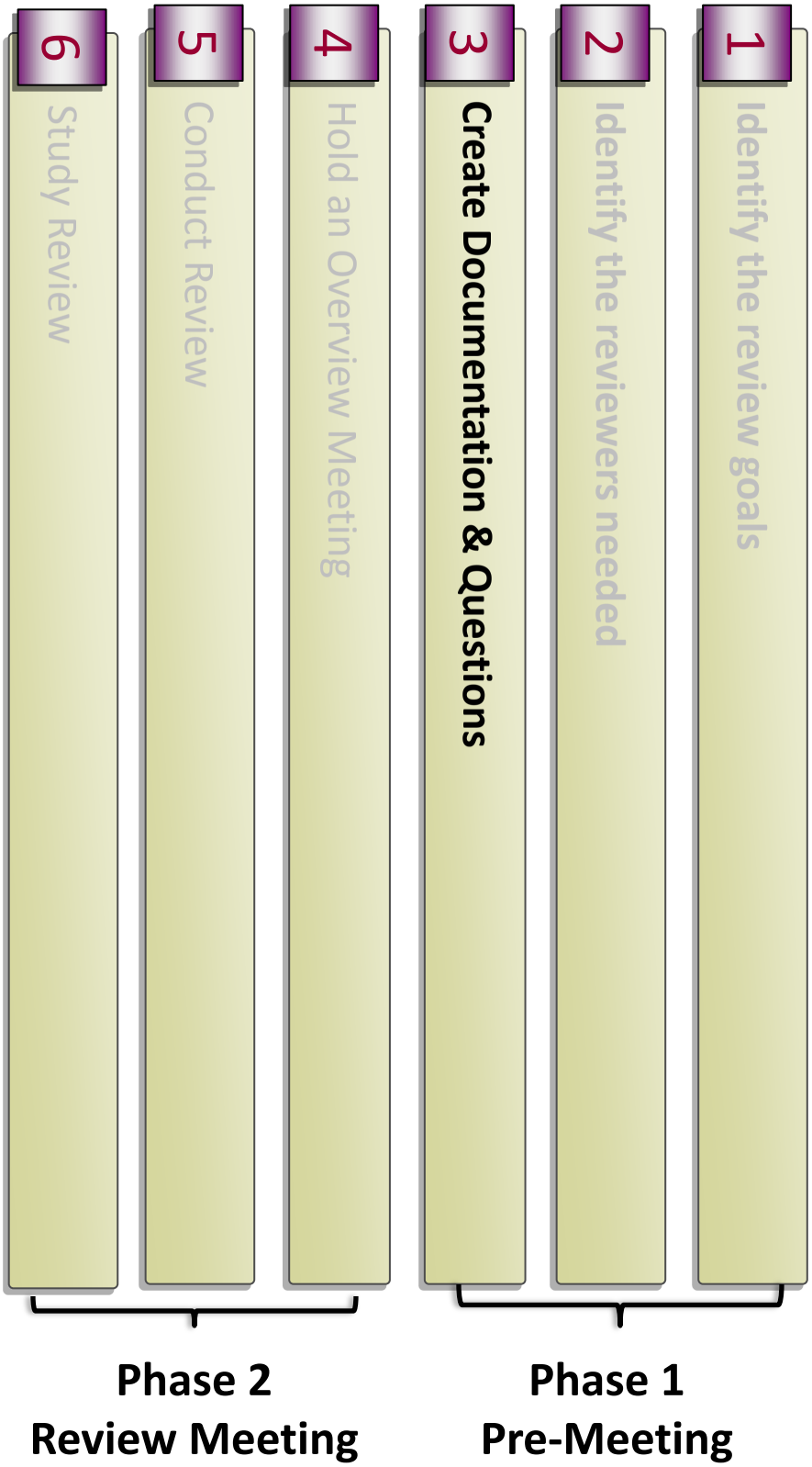
Active Design Review

Identify the reviewers needed



Designers identify two to four qualified reviewers and obtain their consent to do the review. People with different perspectives and expertise are needed. Programmers, Analysts, …

Active Design Review



Example Documentation

Make assumptions explicit

1. It is possible to obtain all the orders for a patient.
2. The order always contains at least one item
3. The status of an order is in one of the two states i.e active or cancelled.

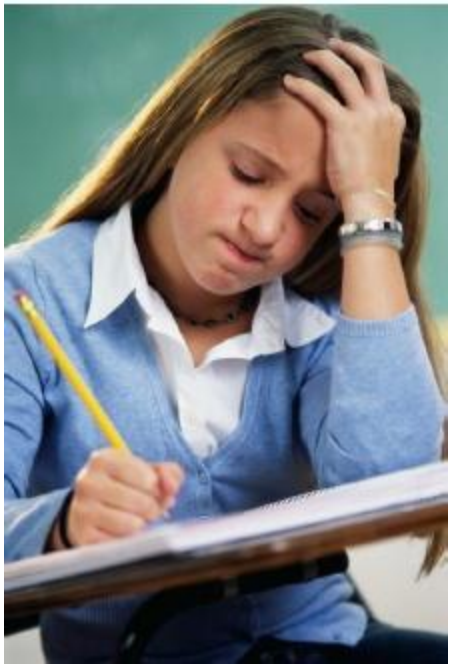
Incorrect Usage Assumptions (UE)

1. Cannot add or remove items once the order is placed.
2. Once an order is cancelled, the status cannot be set to active again.
3. An item is always added with respect to an order.

Design the questionnaires

If asked conventional yes/no type questions, the reviewers will answer without much thought.

Designers formulate questions to be answered by reviewers. Force reviewers to understand the design.



Make reviewers take an active role.

"Write down the exceptions that can occur"

rather than

"Are exceptions defined for every program?"

Example Conventional Questionnaire

- ☐ The notations used for each model are correct.
- ☐ Every required section of the SAD is present.
- ☐ The SAD specifies the program's main components.
- ☐ The SAD specifies the states and state transitions for all components with important states.
- ☐ The SAD specifies important or complex component collaborations.
- ☐ The SAD specifies each component's responsibilities.
- ☐ The SAD specifies each component's interface.
- ☐ The SAD specifies each component's important properties.
- ☐ The SAD specifies each component's important relationships to other components.
- ☐ The SAD clearly states the connections between different architectural models.
- ☐ The SAD states the rationale for all important design decisions.
- ☐ Each design rationale states the problem to be solved and the constraints on the designer.
- ☐ Each design rationale summarizes the major design alternatives and their evaluations.
- ☐ Each design rationale explains why the final design was selected.
- ☐ All specifications are clear.
- ☐ No specification contradicts any other specification in the SAD.

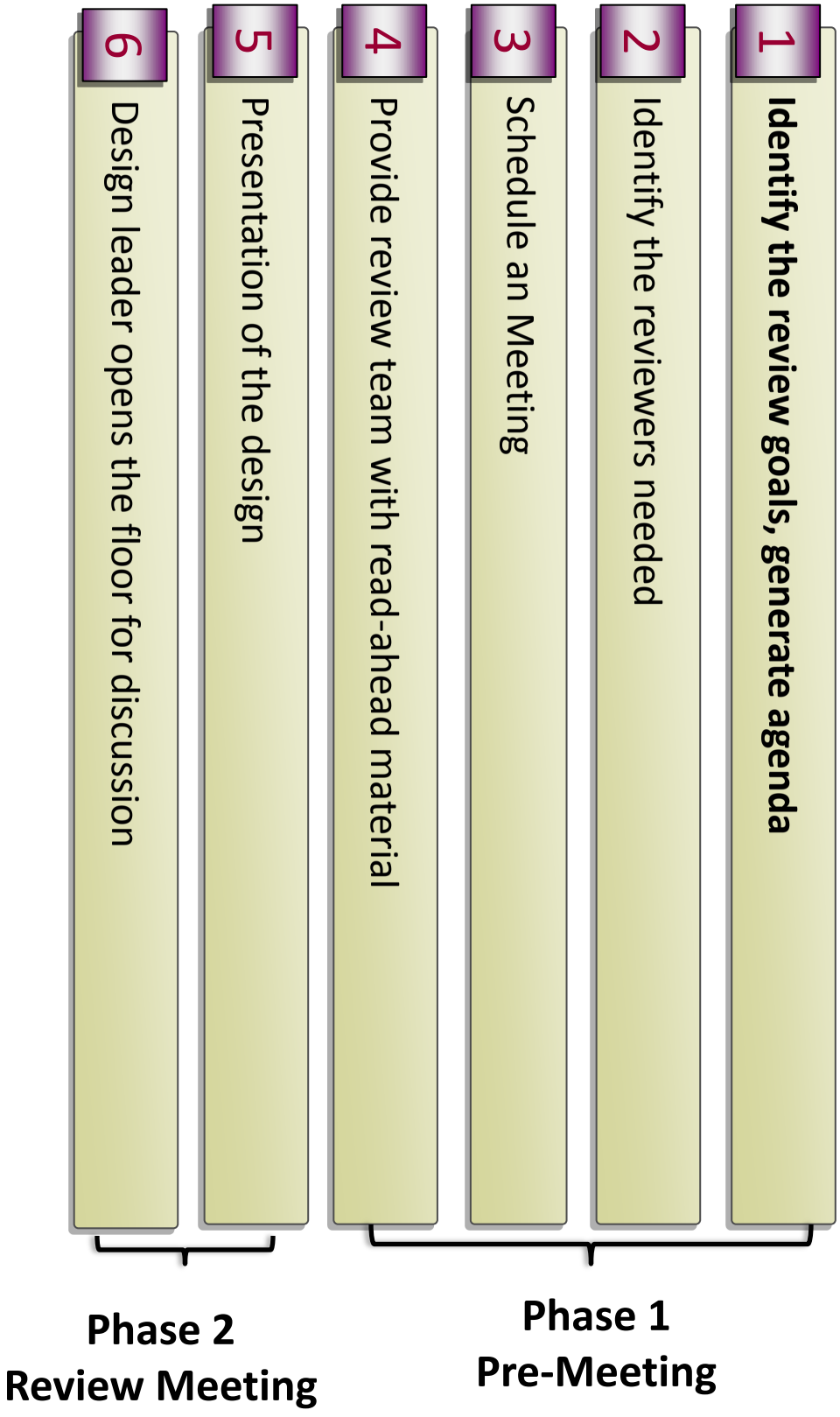
Example Questionnaire

1. Using the access functions provided in the module specification, write the code you would use to obtain the date/time, item number and quantity ordered for all active orders for a patient.

2. Attempt to come up with a sequence of access function calls that would allow a program to set a cancelled order's status to active.

3. For each access function provided, write down the specific requirements from the requirements list that you believe the function was designed to meet. Make note of any functions that do not appear to satisfy any specific requirements.

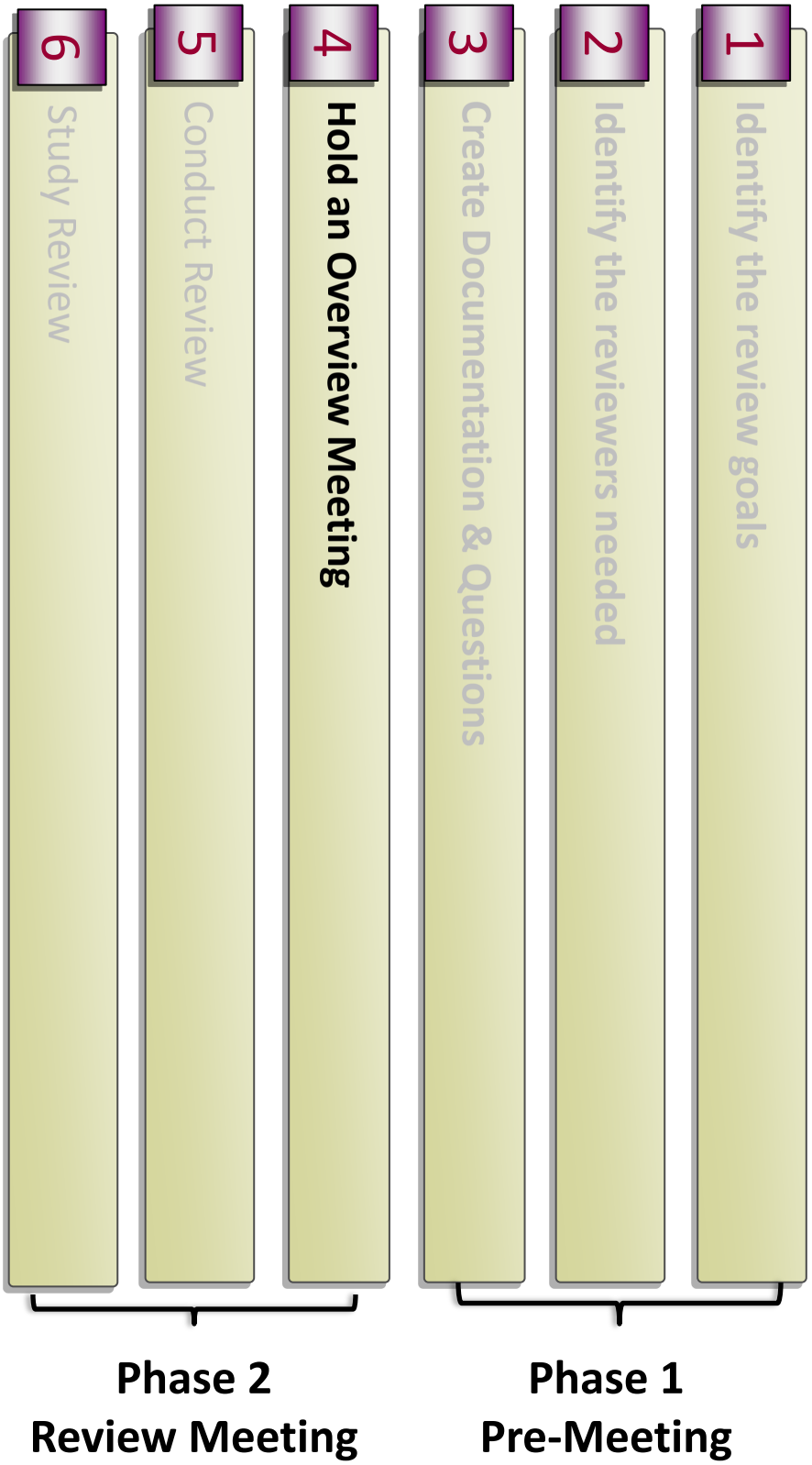
Conventional Design Review



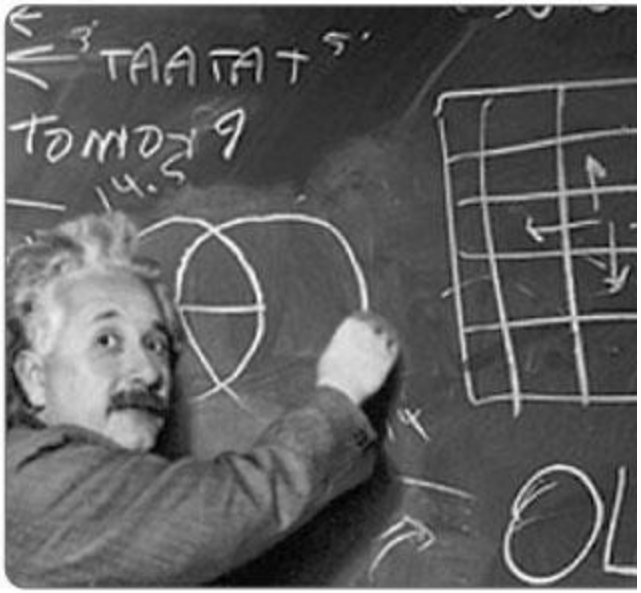
Conventional Review vs ADR

Conventional Design Review Ques.	Active Design Review Instructions
Are exceptions defined for every program?	Write down the exceptions that can occur for every program.
Are the right exceptions defined for every program?	Write down the range or set of legal values of each parameter. Write down the states in which it is illegal to invoke the function.
Are the data types defined?	For each data type write down: An expression for a literal of that type, a declaration statement for a variable of that type, the range.
Are the programs (functions) sufficient?	Write a short pseudo-code program that uses the design to accomplish some task.
Is the performance of each program adequately specified?	For each program write down its maximum execution time/resources

Active Design Review



Hold an Overview Meeting



Designers sketch the architecture, explain the process, etc.
Designer then assigns reviews to reviewers.

Active Design Review

Conduct the review

Reviewers may meet with designers are send emails to get clarification, explanations, etc.

The reviewers do their reviews on their own and deliver their results when complete

Sample Review

1. The access functions should be evaluated to ensure that access is provided to all data required by the other modules

2. Piece of data about an order that cannot be retrieved through an access function but needed reflects error in design.

3. Possible to modify the value of any piece of data in violation of the stated requirements, then there is a design error.

4. The module specifications should be reviewed by programmers of the other order processing system modules for their ability to satisfy these criteria.

Active Design Review

Study Reviews

Designers review completed questionnaires, and meet/email reviewers to resolve questions