



University of Southern California  
Center for Software Engineering

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# **IV&V Role**

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# Outline

- **CS577 Quality Management Overview**
- **The IV&V Role for DEN Remote students**
  - **What it is & how it works**
  - **Principles behind it**
  - **How it is distinct from other project participation**



# CS577 Quality Management Overview

- **Objective: High-quality products for clients**
  - Early defect identification and removal
  - Thorough configuration management
- **IV&Vers have lead responsibility for QM**
  - Develop QM and CM plans
  - Monitor exercise of plans
  - Perform reviews and exercises of products
  - Submit concerns to developers for response
- **On-campus LCP lead will be QM coordination Focal Point**
  - Concur with IV&V QM Plans
  - Integrate them into LCP



# Quality Management

## The Quality tasks in QM

- **Quality Assessment (and Reporting)**
  - Peer (team) reviews
  - Agile (IIV&V) Artifact Reviews
  - Testing
- **Quality Tracking (Follow up on the “Reports”)**
- **Quality Improvement**

## With pre-requisites

- **Configuration Management**
- **Early Defect Finding (Identification) mechanisms**
- **Defect and Effort Data Submittal**



## CS577 LeanMBASE Defect Reporting Concepts

Range of Defect Identification & Reporting mechanisms

- **One at a time:** gnats (or other) problem reporting system
- **Multiple issues/problems found by a single reviewer:** Agile Artifact Review (only two types of forms : Issues/Concern and Defect List)
- **Agile Internal/Informal Review:** Three types of Forms
- **Agile Formal Review:** Three different types of forms
- **Internal/Informal Review:** Four different types of bigger forms
- **Formal Review:** Four different types of bigger forms
- **Fagan's Inspection:** Five different types of forms



## Lessons Learned

For Quality Management in CS577 with teaches LeanMBASE

- Different information relevant for different types of reviews
- Subjective definition of a “defect” :
  - Who decides? Only the “author”: every change made
  - Call all identifications from review activity a “concern”

From Quality Improvement World

- Push on Productivity, get productivity impact;  
Push on Quality get a multiplicative impact on productivity
- Defect prevention and early defect detection:
  - Increases Quality and decreases [total] cost
  - Requires an investment
  - Seems to require/imply “process”



# “Agile QM”

- **More effectively achieving Quality by sharing tacit knowledge**
- **Risk-driven**
  - Importance of scenarios
  - Criticality of defects
  - Risk of late defect detection
  - Risk of missing resources  
(test data, drivers, tests, oracles, etc.)
- **Efficient**
  - Risk-driven Peer Reviews (PR) or Perspective Based PRs
  - As early as possible
  - Automated aides
  - Essential plans



# IV&V for DEN Remote Students

**Integrated IV&V (IIV&V) person assigned to a campus-based project.**

- You do all the same individual homework assignment, quizzes and learning, including the use of the class tools.
- You **PRODUCE** the draft QM and CM plans.
- You **MONITOR** QM and CM activities and report to Proj. Ldr.
- Rather than producing a project team's artifacts or "team homework" assignments, you will be "**reviewing**" them.
- You do a thorough technical review of the document packages and models (at various stages)
  - If things are "wrong", you blow the whistle
  - If things might be OK but have to be explained verbally, you "see" that it gets documented and fixed
- You **PARTICIPATE** telephonically in the ARBs for your team
- You independently, but with the client, develop acceptance tests



## IV&V for DEN Remote Students (cont)

- **"Reviewing" a project team's artifacts. As a result of the review,**
  - You may resolve simple questions directly with the Artifact's "author"
  - You produce "Concern Logs"
  - Send all "concern logs" to the team electronically & a copy to the TAs
  - You should generate "problem reports" for open issues.
- **Thorough technical review of the document packages and models**
  - Made available just prior to the "Architecture Review Board"
  - Submit those "concern logs" directly to the CS577a instructional staff before the scheduled ARB (and to the team afterwards)
- **Participate in ARB for your team**
  - Telephonically (we can and will CALL you)
  - Possibly supplemented by other remote meeting capabilities, like Skype or netmeeting.



# Schedule

Evaluation of WinWin Negotiation	09/20/06
Evaluation of Early OCD	09/27/06
Evaluation of Quality Report of Early OCD	09/27/06
Evaluation of Prototype	10/02/06
Evaluation of EasyWinWin Report	10/04/06
Evaluation of LCO Core	10/09/06
Evaluation of LCO Draft & QM Plan	10/16/06



# Schedule (cont)

Evaluation of Quality Report of LCO Draft	10/18/06
Evaluation of LCO Package	10/30/06
Evaluation of Updated EasyWinWin Report	11/08/06
Evaluation of LCA Draft & QM Plan Updates	11/27/06
Evaluation of Quality Report of LCA Draft	11/27/06
IV&V Individual Critique	12/06/06
Evaluation of LCA Package	12/11/06



# Evaluation Report Content

**For each evaluation assignment,  
you will produce a report in which you evaluate  
the team artifact (e.g., LCO Package)**

**You should consider the following:**

- 1. Did the team tailor the CS577 LeanMBASE Guidelines appropriately?**
  - a. Did they include the right things (should something be included or removed)?**
  - b. Did they document the changes to their exit criteria?**
  - c. Is the team's rationale for their tailoring reasonable?  
Is the team's rationale for NOT tailoring reasonable?**
  - d. Have they introduced or reduced risk?**



## Evaluation Report Content (cont)

- 2. Given the tailoring, review of content for the following**
  - a. Errors?**
    - i. Project concerns (e.g., missing requirements, incorrect implementation, unsatisfied quality)**
    - ii. LeanMBASE concepts (e.g., errors in use of LeanMBASE Guideline).**
    - iii. Representation (e.g., use of incorrect UML Diagram or incorrect representation of concept)**
    - iv. Exit Conditions (e.g., violation)**



# Evaluation Report Content (cont)

## b. Omissions ?

- i. Project Concerns (e.g., unidentified risks)
- ii. LeanMBASE concepts (e.g., missing something LeanMBASE requires)
- iii. Representation (e.g., missing diagram, model or concept)
- iv. Exit Conditions (e.g., unsatisfied condition)

## c. What is good?

- i. Project Concerns (e.g., clear requirement specification)
- ii. LeanMBASE concepts (e.g., met or exceeded LeanMBASE guidance without introducing risk)

## d. Representation (e.g., well represented concept)

- i. Exit Conditions (e.g., condition met or exceeded without introducing risk)

## d. Corrections Made In Revisions (very few documents do not have revisions!)

- i. Are all updates justified by the defect lists?
- ii. Are any non-defect changes justified by other clarifications (e.g., meeting minutes with client); or better English, or better representation, or ...?



# Evaluation Report Content (cont.)

## **d. Corrections Made In Revisions**

(e.g., a document has been revised)

- i. Are all updates justified by the defect lists?
- ii. Are any non-defect changes justified by other clarifications (e.g., meeting minutes with client)?

## **3. Are there any model clashes?**

## **4. Feasibility of the “solution” or approaches:**

**e.g., does project look on track?  
is solution likely to meet goals?  
...?**

## **5. What are the 5-10 most critical issues/concerns?**

**a. List them explicitly [what are they]**

**b. Justify your assessment/evaluation [WHY?]**



## Evaluation Report Content (cont.)

3. Are there any model clashes?
4. Feasibility of the solution (e.g., does project look on track, is solution likely to meet goals).
5. What are the 5-10 Concerns that are most critical?

Justify your evaluation.