INF 117
Project in Software Engineering

Lecture Notes – Winter Quarter, 2008

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Set 4 – Requirements / Design

Announcements

- Due (next week) 2/4
  - Requirements Iteration (Final)
  - Design Iteration #1
  - Project Plan #2
- Project Plan #1 – would like by Thursday
- Have Requirements approved ASAP (no later than 2/5)
- Keep your team sites up to date
  - Include Minutes from meetings
  - Meeting Schedules
  - Calendar
  - Updates on what is going on
- Reminder – use your resources
  - Previous S/E Textbooks
    - Templates you or your teammates have used before
  - Previous INF 117 Resources – check EEE
  - Online Resources

Today

- Review of how you will be assessed
- Peer Evaluations
- Requirements
  - Final Notes
- Design
  - 4+1 view of S/E Architecture

How are you Assessed?

- 2/3 – 3/4 => Team
  - This is a "team" project – how you perform as a team overall is essential
  - Deliverables
    - Are they on time, thorough, complete, correct?
  - Team website
    - Is it complete, professional, up-to-date
  - Do you have regularly scheduled meetings?
    - This should be posted on your website.
    - Are you minutes posted?
  - How are your peer reviews?

Will all team members get the same grade?
→ Maybe

How are you Assessed? (2)

- 1/3 – 1/4 => Individual
  - Do you show up to team meetings?
  - Are you present for customer meetings?
  - How is your attendance in class?
    - Especially for Team Presentations → This is a deliverable!

Peer Evaluations

- For each future presentation
- Evaluate on
  - Technical Aspects
  - Style
    - How are the slides?
    - How was the presentation overall?
    - How was the presenter?
  - Project, Process, Progress
    - Overall assessment of their project
    - Are they following a good S/E Process?
    - Are they sticking to their project plan?

Requirements Guidelines

- At the highest level, we want to confirm that the specification is
  - Well-structured
  - Consistent
  - Complete
  - As unambiguous as possible
  - An accurate representation of customer requirements

Requirements Guidelines (2)

- At the next level…

1. Is the overall structure of the document reasonable and complete?
   - Does it follow a template or structure agreeable with SE practices/textbooks?

Requirements Guidelines (3)

2. Are use cases used? If not, why?

   If yes..
   - Is the number of use cases reasonable for the project at hand?
   - Are the use cases corresponding to user or system goals and using active-verb style for use case names?

3. Is a reasonable use case template used? Is it used consistently for all use cases?

Requirements Guidelines (4)

4. Is there a use case diagram? If not, why?
   - Are all use cases and actors identified and consistent with the scope of the project?
   - If use case relationships like Includes and Extends are used, are they used correctly?

5. Are other sections of the requirements document correct and complete?
   - For example, if the project has known design guidelines or external constraints, are they listed?
   - If the project clearly requires additional sections, such as UI or Web designs for GUI systems
     - highly recommended, but not absolutely required.
     - You need to describe clearly how it looks
     - mock ups would make it a lot easier)
   - … are those identified, complete and done correctly ?

Requirements Guidelines (5)

6. Are the functional requirements detailed enough?
   - Going by the basic idea that the reader should be able to read it and fully implement the system without additional information/questions.

- As a reminder..
  - Your document should be posted online.
  - Make sure that you provide a copy for your customers
    - Use the format (paper, electronic, etc) that they prefer.

Problem with S/W Architecture

- Arch. documents over-emphasize one aspect of development
  - i.e. team organization
  - do not address the concerns of all stakeholders

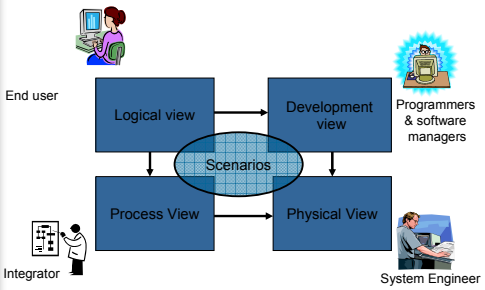
- Various stakeholders of s/w system:
  - end-user, developers, system engineers, project managers

- Lots to represent → Documents contain complex diagrams

Solution

- Using several concurrent *views* or *perspectives*, with different notations each one addressing one specific set for concerns
- "4+1" view model presented to address large and challenging architectures

4+1 View Model of Architecture



Logical View

Object-oriented Decomposition

- **Viewer:** End-user
- **Considers:** Functional requirements- What the system should provide in terms of services to its users.
- **Notation:** The Booch notation (OMT) (object and dynamic models)

Process View

Process Decomposition

- **Viewer:** Integrators
- **Considers:** Non - functional requirements (concurrency, performance, scalability)
- **Style:** Several styles would fit in this view (Garlan and Shaw 's Architecture styles)

Process View (2)

- Uses multiple levels of abstractions, a logical network of processes at the highest level
- A process is a grouping of tasks that form an executable unit:
  - Major Tasks: Arch. relevant tasks
  - Minor Tasks: Helper tasks. (Buffering)

Development View

Subsystem decomposition

- **Basis of a line of product**
- **Viewer:** Programmers and Software Managers
- **Considers:** software module organization (Hierarchy of layers, software management, reuse, constraints of tools)
- **Style:** layered style
- **Notation:** the Booch notation (module, subsystem, layer)

Physical View

Mapping the software to the Hardware

- **Viewer:** System Engineers
- **Considers:** Non-functional req. regarding to underlying hardware (Topology, Communication)
- **Notation:** May have several forms and may Tightly connected to the process view

Scenarios

Putting it all together

- **Viewer:** All users of other views and Evaluators.
- **Considers:** System consistency, validity
- **Notation:** almost similar to logical view

- Helps illustrate and validate the document
- Helps the Architect during the architecture design

Correspondence Between Views

- Views are interconnected.

- Start with Logical view (Req. Doc) and Move to Development or Process view and then finally go to Physical view.