CSSE 372 Software Project Management:
Software Project Work Breakdown Structures

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THE TREBUCHET IS ALMOST DONE! MM.
THE RANGE SHOULD BE OVER 150 METERS.

LOOK, I'M SURE IT'S A COOL PROJECT.

BUT EVENTUALLY YOU'LL NEED TO OUTGROW THESE TOYS, AND FOCUS YOUR ENERGY ON SOMETHING PRACTICAL.

SAYS THE GIRL WHO MOUNTED AN AUTO-TARGETING KILOWATT LASER ON THE ROOF.
THIS MAD SCIENCE IS GETTING OUT OF HAND.

THAT'S PRACTICAL! IT KEEPS SQUIRRELS OFF THE FEEDER!
Plan for the Day

- Plus/Delta Evaluation Reflections
- Work Breakdown Structures (WBS)
### Feedback: Lectures

#### Pace

- **0** – much too fast
- **13** – somewhat too fast
- **24** – Somewhat too slow
- **0** – much too slow

#### Working well

- Lectures well-organized/paced
- Good class/group activities
- Right material & good slides
- Group games
- Daily quizzes
- Knowledgeable instructor
- Good case studies
- Cartoons/humorous slides

#### Improvements

- On Target
- More interactive exercises
- Bit slow (3) vs. Bit fast (2)
- More (2) vs. Less (2) depth
- More visual material
- More analogies/connect dots
- More case studies
- Avoid dry material
- Avoid random calling on people
- Less discussions with partner
- Move time to later in day 😊
**Feedback: Quizzes**

**Quizzes**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>14</td>
<td>Very helpful</td>
</tr>
<tr>
<td>20</td>
<td>Somewhat helpful</td>
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<tr>
<td>2</td>
<td>Somewhat unhelpful</td>
</tr>
<tr>
<td>1</td>
<td>Very unhelpful</td>
</tr>
</tbody>
</table>

**Working well**

- Enforced note-taking 😊
- Focuses lecture direction
- Indicates high points
- Good study guide/aid
- Questions work well
- Integration with material
- Good coverage of important topics

**Improvements**

- Quizzes are fine
- Be more specific in answers
- Easier (4) vs. Harder (3) questions
- More open-ended questions (2)
- Make questions even shorter (1)
- Avoid “list the…” questions
- Better matching questions to slide content
- Put a fun question on quiz!
- Don’t have quizzes (1)
**+/− Feedback: Reading and Homework**

<table>
<thead>
<tr>
<th>Reading</th>
<th>Homework Difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – all of it</td>
<td>0 – much too difficult</td>
</tr>
<tr>
<td>12 – most of it</td>
<td>18 – a bit too difficult</td>
</tr>
<tr>
<td>21 – little of it</td>
<td>18 – a bit too easy</td>
</tr>
<tr>
<td>2 – none of it</td>
<td>1 – much too easy</td>
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### Feedback: Homework Helpfulness

#### Homework Helpfulness

<table>
<thead>
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<tbody>
<tr>
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<td>0</td>
<td>very unhelpful</td>
</tr>
</tbody>
</table>

#### Improvements

- Nothing, it’s working well (8)
- More challenging homework
- More frequent, but shorter
- First assignment tedious
- Provide small FAQ for 1st HW
- Provide examples of good HW to manage expectations
- Align HW and lectures better
- SimSE contrived, not useful
- Too easy (2) vs. Too hard (3)
- Case study papers long/hard
- Spread out case studies
- Clarify when case studies due
- Assignments due at 11:55pm

#### Working well

- Frequency/Length about right
- Reflects in-class material
- Good feedback
- SimSE useful and fun
- Real-world insights
- Tool experience – COCOMO
- Relevant/applies concepts
- Not overwhelming
Feedback: Workload

Workload

0 – much higher than average
7 – somewhat higher than average
30 – somewhat lower than average
0 – much lower than average

General Comments

- Just about right / keep up good work (8)
- Hard course, but making it interesting
- SimSE/games good in class
- Should use “just right” (porridge not always too hot/cold)
- Better align times for CSSE 371 & 372 – 5 hrs apart
- Encouragement (37), Neutral (0) Discouragement (0) 😊
Summary of \( \pm \partial \) Actions

- Pick up the pace and challenge
  - Project Plan will help…

- Continue games, interactive and group exercises

- More visual material for class slides

- Move homework due time to 11:55pm
  - Better clarify case study due dates
Learning Outcomes: Schedule

Create and maintain a software project schedule.

- Identify project tasks for planned work
- Develop a Work Breakdown Structure (WBS)
What are some examples of software “work” products?

What activities produce these work products?

- Think for 15 seconds...
- Turn to a neighbor and discuss it for a minute
The Work Breakdown Structure (WBS) is a hierarchical description of all of the work that must be done to meet the needs of the client.

1. Thought process tool
2. Architectural design tool
3. Planning tool
4. Project status reporting tool
Hierarchical Visualization of the WBS
BEFORE

AFTER

P90X
It really works
WBS Completion Criteria

1. Can I determine activity status at any point in time?
2. Is there a defined start and end event?
3. Does the activity have a deliverable?
4. Can I easily estimate time and cost?
5. Is the activity duration within acceptable limits?
6. Can the activity work be done without interruption?
Client didn’t participate in building WBS like you hoped
You may have an uncomfortable feeling
Scope change is likely to be a big part of the project

Choose an appropriate process model that accommodates requisite change and rigor
Basic Structures of the WBS

- Deliverables-based structures
  - Physical decomposition
  - Functional decomposition

- Task-based structures
  - Design-Build-Test

- Organizational structures
  - Geographic
  - Departmental
  - Business Function
Indented Outline WBS for a House

1. SITE PREPARATION
   1.1. Layout
   1.2. Grading
   1.3. Excavation

2. FOUNDATION
   2.1. Erect Forms
   2.2. Pour Concrete
   2.3. Remove Forms

3. FRAMING
   3.1. Floor Joists
       3.1.1. Install first floor joists
       3.1.2. Install second floor joists
   3.2. Sub-flooring
       3.2.1. Install first floor sub-flooring
       3.2.2. Install second floor sub-flooring
   3.3. Stud Walls
       3.3.1. Erect first floor stud walls
       3.3.2. Erect second floor stud walls
   3.4. Frame the roof
WBS for a Waterfall Development Method
Mythical Man Month 20 years later

By Fred Brooks

- How does Harlan Mills’ making “programming a public process” improve software?
- What did Prof. Brooks mean by “People are everything?”
- How does Prof. Brooks feel about David Parnas’ information hiding?
General Perspective on Exam 1:

- Exam will be 45 minutes
  - Some multiple choice/short answer (40%)
  - Some essay/exercises/problem sets (60%)
  - Close book/notes/computer...

- What is fair game?
  - Class slides and daily quizzes
  - Book/Readings/Case Studies

- Study Strategy
  - Daily quizzes → Slides → Books/Readings/Cases

- Can have a help sheet
  - 1 page, no less than 6 font
MIDNIGHT DREARY IT WAS, PONDERED DID I. WEAK AND WEARY I WAS.

EDGAR ALLAN POE
Homework and Reading Reminders

- Prepare for Friday’s Examination
  - We will have a short review on Thursday

- Complete Homework 3 – Software Estimate Using COCOMO-II or Costar
  - Due by 11:55pm, Today, September 25th, 2012

- Complete Homework 4 – Software Risk Tables and Risk Sheets
  - Due by 11:55pm, Tuesday, October 2nd, 2012