Why do design projects fail to deliver a good solution on time and within budget?

• With a neighbor, make a list of reasons.
• Order the list from most common to least common.
• Call out.
Why do design projects fail?

1. Misunderstanding what the customer needs.
2. Committing to a solution too early.
3. Lack of teamwork: esp. communication & conflict resolution, and across disciplines.
4. Poor system architecture, especially interfaces.
5. Poor planning.
Assignment 4

Please take it seriously:
• real alternatives
• real evaluation
An Engineering Design Process

Client Need

Problem Definition

Conceptual Design

System-level Design

Detail Design

Design Communication

Final Design
Generate concepts of candidate designs:

5. Establish design specifications
6. Generate ideas
Last Time

• Mental blocks
• “Fail often to succeed quickly.”
• Most good ideas are old ideas applied in new ways
• Techniques for breaking mental blocks:
  – Brainstorming
  – Morphological charts
Technique 3: Group Brain-writing

- Make sure everyone in group is clear on problem to be addressed
  - Write a statement / draw diagram
- Silently, generate 3 ideas. Use multiple sheets of paper if paper is small. Limit time.
  - Sketches + labels (minimum of words)
- Rotate ideas to person on the right.
Technique 3: Group Brain-writing, cont.

- Build on the ideas just passed to you, for a set period of time.
  - New ideas allowed, if spurred by ideas given to you
- Repeat until ideas reach originator.
- Review, discuss, evaluate, combine.
  - post on the wall
- Choose a subset to carry forward.
6-3-5 Approach

• +/- 6 team members,
• Rotate 3 ideas in a round,
• Complete ~5 rounds:
  – one round for each of the ~4 most prominent functions
  – one round on system configuration
Exercise

1. Combine your team with another.
2. Identify a design problem to address.
3. Generate 3 ideas, silently. (5 min.)
4. Rotate, and build on others’ ideas, silently. (5 min.)
5. Rotate again, and build once more, silently. (5 min.)
6. Together: discuss, evaluate, combine
Now what do we do?

- Establish evaluation criteria.
- Evaluate the alternatives.
- Eliminate the infeasible / inferior ideas.
- Do more research and development work.
- Converge on a solution that meets/exceeds client’s and users’ needs.