

Intro to Design

What is design?
Designing project goals & schedule



My CIS (4|5)22 mantra: It's all design

- Design of the process
- Design of the product
- Design of the organization
- ...

But I haven't said what I mean by "design"



A working definition of design

Design is reasoned choice among alternatives

Implies: Generation of alternatives

Implies: Rational criteria for choosing

Implies: Explicit goals and constraints



Explicit goals and constraints

You can't possibly make rational choices without explicit goals and constraints

Too often skipped as "obvious."

A lot of poor design results from not thinking clearly (and creatively) about objectives; a lot of "outside the box" solutions result from insights about goals

Ask "why". A lot.

- Including with clients: Help them discover what they want.

Explore the boundaries: What if x wasn't a goal?

What would be wrong with y?



Generate alternatives

Even if the first idea is “obvious”, explore others

- What is the design space?
- Even “clearly wrong” ideas can help elucidate goals and constraints: Why would x not work? What would be wrong with y?
- Even if you settle on that first idea, you’ll understand it better

Generate and discard a lot

- Brainstorm is one approach; rapid filter is another
- Group dynamics matter a lot in creative process



Generating Choices

How do we generate ideas to choose among?

- We want creative, innovative, exciting, beautiful ideas. We need lots of them, to find a few really good and appropriate ones.



Creative by Design

We could wait for inspiration

- but we could be waiting a long time if we haven’t prepared a muse-friendly environment

Or we could be creative *on purpose*, creating a team, environment, and activities to effectively generate and sort ideas

- *the muse wears work boots*



Πολυόμνια



Disciplines of Innovation

Deliberate, thoughtful practices to push thinking

To expand the search space, admitting more potential solutions or broadening the problem definition

To change perspective

To maintain the knowledge base

Marian Petre, “How expert engineering teams use disciplines of innovation”, *Design Studies* 25 (2004), 477-493



Evaluate choices

Attempt to justify design choices w.r.t. objective criteria

- Quick filtering is often aesthetic and informal. When we are arguing or justifying a design decision, we need to go beyond aesthetics (and personalities) to objective criteria

Argument will often bring us back to goals

- Sure approach A is fizzier, but why do we care about fizz? Approach B is furrier.



Capture (record) the choices

Often the most important thing to document is not the decision (which is apparent) but its rationale (which may not be apparent)

- Important for someone who needs to revisit that decision later in the same project or for another
- (Obviously, if it's all design, you can't document every design decision. Do it where it matters.)



Designing the Plan

Goals and objectives for project plan?

- High confidence of finishing on time
- Moderate, even effort level
- Everyone involved, learning, reasonably happy
- (NEXT: notes on software processes)

