why is design so hard?
the “wicked problem” of design

- action versus reflection
  - goal is to create, but need understanding to create well
- fluidity of the design problem
  - incomplete, unknowable, evolving specifications
- any design move may have many effects
  - no independent set of contributing factors
- many stakeholders and external factors
  - some constraints will be relatively arbitrary with respect to overall design goals
- scientific knowledge lags design application
  - best practices, designer expertise reigns

our approach:
scenario-based design

- attention to user experience promotes reflection about the usage situation
- scenarios are concrete descriptions but are also very rough
- scenarios aid communication among the multitude of stakeholders in a work situation
- scenarios can be grouped into taxonomies which allow design knowledge to cumulate across problems
- scenarios can be written at multiple levels and convey many different perspectives

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scenario-based design: how

◆ describe key situations of use
  – narratives that describe a user’s goals, expectations, system interactions, and reactions (not just steps)
  – part of a specification, *from user’s perspective*
  – explore usage consequences of design ideas
◆ reason about and develop these descriptions
  – may work on scenarios at many different levels, from rough to detailed
  – may use various media, e.g., a simple evocative phrase, a text narrative, pictures, storyboards, UI prototype
  – throughout the lifecycle

an example: scheduling a town meeting

Harry is worried about the plans for the new power line. He has never been one to sit back and just worry, so he decides to organize a town meeting to discuss his concerns. He goes to the virtual town hall to set up the meeting. He fills out a meeting template, with “power-line” as a topic, Thurs 7-9 as the date & time, an abstract describing his concerns. He is happy to see he doesn’t have to fill in his contact info, which the VTH has inserted automatically. Finally, he searches the VTH for the power-line planning document and attaches it using a discussion application that other residents can use to make online comments. After submitting the request, the VTH suggests a room at the high school, which Harry OKs. At Harry’s request, the VTH sends the notice to the town issues distribution list, as well as posting it on the meetings bulletin board.
scenarios: where do they come from?

- **frequent or important tasks** the users already carry out that you want to enhance
- observations of **problematic situations** that you think you might be able to “fix”
- situations constructed specifically to **exercise some technology** you have an interest in
- emulation or analogy to **other interesting systems**
- situations that test your **theories of human behavior** (e.g. collaboration, cognition, ergonomics, etc.)

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some “coverage” heuristics

- **establishing goals or orienting context**
  - user (perhaps new) first sits down, what are they thinking, how are they going to want to proceed
- **searching for content or options**
  - user believes they can achieve a goal but must now work out how or where to do this
- **opportunistic behavior, exception handling**
  - something comes up in task that diverts the user, what might it be, how might it change his/her behavior
- **procedural activity, “how-to-do-it” knowledge**
  - core tasks: user knows what/how to do something
- **reflecting, solving a problem, making sense**
  - something has happened to “throw” the user, now s/he takes the opportunity to learn more, better understand the system
what next? work with the scenarios...

◆ goal is to understand what is good and bad about your design ideas (e.g., prior to user test)
  - features of the situation (system) have possible consequences, positive and negative
  - often only implicit in the scenario as told
  - may also involve asking yourself “what if” questions to consider related scenario variants
  - helps you decide whether and how to revise: minimize negative impacts, enhance or capitalize on positives
◆ (we have already seen this, as claims analysis)

back to Harry’s meeting:
ask yourself: what is interesting about this situation, especially with respect to Harry’s experience

giving the responsibility for finding a room to the VTH
+ simplifies the scheduling process for users
+ reduces the prior knowledge requirements (i.e., of rooms)
  - but some users may resent losing control of room selection
  - but some details of the meeting may be unspecified, resulting in an inappropriate room assignment

supporting attachment of documents and applications to notices
+ makes it easy for recipients to consider and react to ideas
+ reinforces the concept of the issue as a forum, not a single event
  - but users may feel impelled to include material even when it is not appropriate or necessary (because they can!)
  - but construction of notices may now be seen as a much more complicated process and scare away some users
writing scenarios with claims in mind

- often you will come up with a scenario because of one or more interesting features and their upsides
  - then can carry out more extensive reasoning, thinking about different ways the scenario could have worked out
- deliberately insert a problematic step in the sequence
  - this forces you to think about how the user would react, what the system might have done better, should do now, etc.
- elaborate a scenario by adding information about what the user might be thinking or feeling along the way
  - Norman’s stages can help here: is the user planning, acting, making sense of feedback, etc.?

another example — from Eudora

While editing his book chapter, Magnus noticed the alert telling him that his new mail was being checked; when he saw some mail being transferred, he left Word to see what it was. When he double-clicked on the Eudora icon on his desktop, his In mailbox appeared, with the messages ordered by time of delivery. He immediately saw from the dots on the leftmost column that he had five or six new messages. He quickly scanned the sender and subject fields to see which were of most interest. He decided to pass on one of them, because he could see that it included an attachment. Magnus figured he didn’t have the time to respond to anything more than the simplest messages. He started with the oldest one. It was a short message of information only from his manager. As he scrolled to the bottom of the message, another new message appeared in its place—the message he had decided to skip for now, with the attachment. Irritated, he closed the message, then began again with the next one. Soon he had browsed all but the deferred message. As often was the case, he felt vaguely unsatisfied; no real news, even though he had spent several minutes reading his mail. He again promised himself that he would no longer be such a slave to his email.
some claims from Magnus’ email episodes

automatic alerts indicating that incoming mail is being monitored
+ directs users' attention to new communication activities
+ may increase a user's responsiveness to others' communication
- BUT may intrude on other important activities
- BUT users may use such alerts as a crutch for managing their communication

placing a dot in the left-most column of entries for unread messages
+ captures the user's attention on opening the window
+ suggests that unread messages are special or interesting
- BUT users may come to rely extensively on these cues in deciding what mail to process

decorating composite messages entries with document icons
+ captures the user's attention when browsing the list
+ conveys directly that these messages contain a document
+ may suggest that these messages are more important than others in the queue
- BUT users may avoid messages that imply a more complex interaction

opening the next unread message by default when browsing an email queue
+ minimizes selection actions during email browsing
+ implies that the next “correct” action is to browse the next message
- BUT users may expect to see the next message in the queue (i.e., not the next new one)
- BUT users may be irritated when unwanted messages appear without request

so how could you work with these claims?
the general heuristic: capitalize on the positives, while addressing the negatives
a point of clarification

claims analysis can be carried out at many points during design and development
− Harry’s meeting was an early envisionment; Magnus’ usage experience captures features of an actual system
− your group is conducting part of such an analysis, for a piece of “prior art” in support of your new design

when we talk about scenario-based design we are imagining an extended process in which scenarios and claims reasoning are used over and over

final note: the multiple roles of user scenarios...

usability specification
functional specification
object model
UI metaphor
formative evaluation
documentation, training & help
summative evaluation
system vision
task scenario
design rationale