

CSCI 2040U – SOFTWARE DESIGN & ANALYSIS

4A: Requirements Introduction



ADMIN AND ACTION ITEMS

Midterm I is Next Thursday (Feb 6)

- Study Guide Coming Soon – Will cover everything up to the end of this week.
- Done in class, using Canvas Quizzes and Respondus.
- If you plan to write at the Testing Center, book NOW.



QUESTIONS FROM LAST CLASS?

Happy Customer

Iteration

High-Level Requirements
(features)

Iteration Plan



AGENDA

Software
Development
Stakeholders

Software
Requirements

- Requirements Elicitation
- Requirement Attributes



STAKEHOLDERS?

#punsr **STAKEHOLDER**



Picking up meat



punsr.com



SOFTWARE DEVELOPMENT STAKEHOLDERS

A Software Development Process has multiple
"Process Actors" [SWEBOK]

- Users
- Customers
- Software engineers



CLASSES OF PEOPLE INVOLVED WITH SOFTWARE PROJECTS

developers

clients

users



How the customer explained it



How the Project Leader understood it



How the Analyst designed it



How the Programmer wrote it



How the Business Consultant described it



How the project was documented



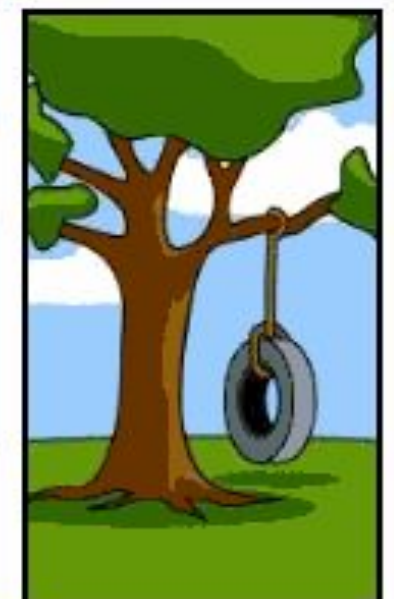
What operations installed



How the customer was billed



How it was supported



What the customer really needed

REQUIREMENTS?



SOFTWARE REQUIREMENTS

Software Requirement: "a software capability needed by a user to solve a problem..."
[GLOSSARY]



WHAT IS A REQUIREMENT?



"Yes, I'm a real Genie... but you're asking me to understand your client's requirements and even I can't do that!"

A requirement:

- *"The system shall allow the user to access his account balance".*

Not a requirement:

- *"Customers' account balances will be stored in a table called 'balance' in a MySQL database".*

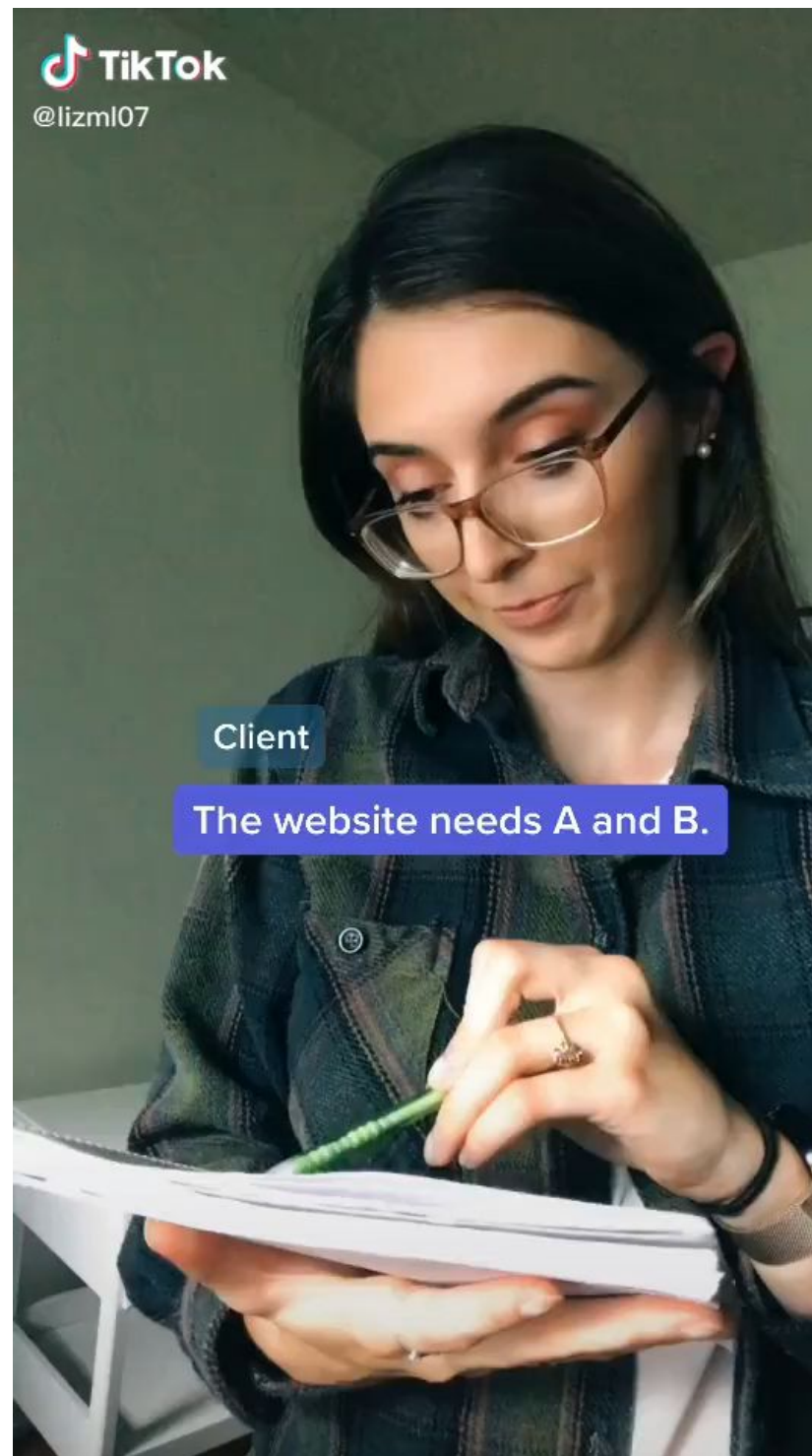
>>>> Requirements describe *what*, not *how*

No reference to implementation detail!

[adapted from Braude, 2001]



REQUIREMENT DESCRIBES WHAT NOT HOW

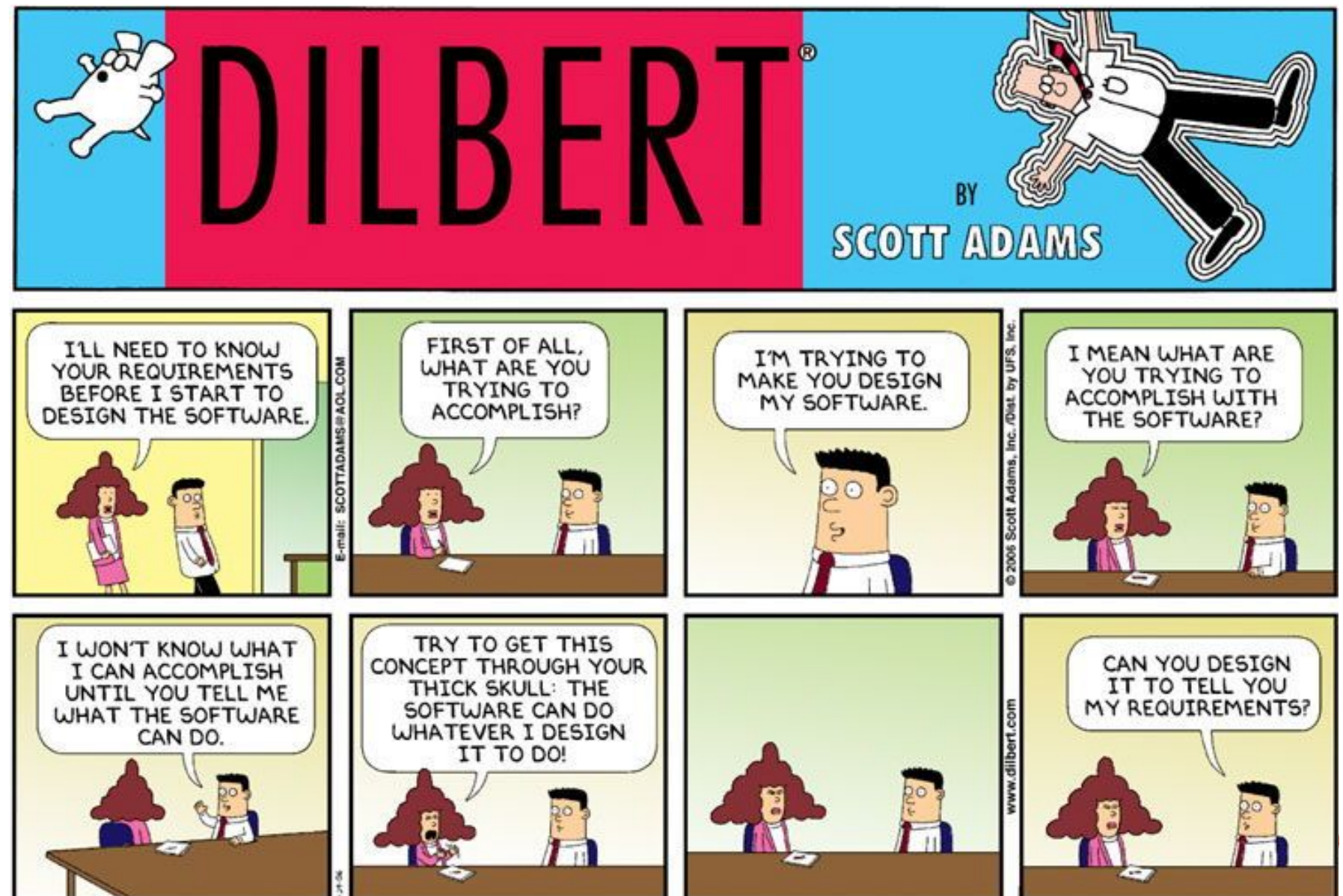


REQUIREMENTS ELICITATION?



REQUIREMENTS ELICITATION

Requirements elicitation: "the process through which the acquirers (customers or users) and the suppliers (contractor) of a system discover, review, articulate, understand, and document the users' needs and the constraints on the system and the development activity" [GLOSSARY]



REQUIREMENTS ELICITATION

I know I said I wanted a Mustang, but I was really looking for the five-liter, turbocharged model...



REQUIREMENTS ELICITATION

- A process to A,B,C,D,E the needs and constraints of a system

A. discover

B. review

C. articulate

D. understand

E.



REQUIREMENTS ELICITATION

Repeatedly ask good questions

Bluesky(?) with your customer

- "sky is the limit"
- stay open minded



BLUESKY



REQUIREMENTS ELICITATION

Role play (?)

- Have the customer play the software and have a dialog

Observation (?)

- Watch how the client performs tasks without the software

Now we can role play.

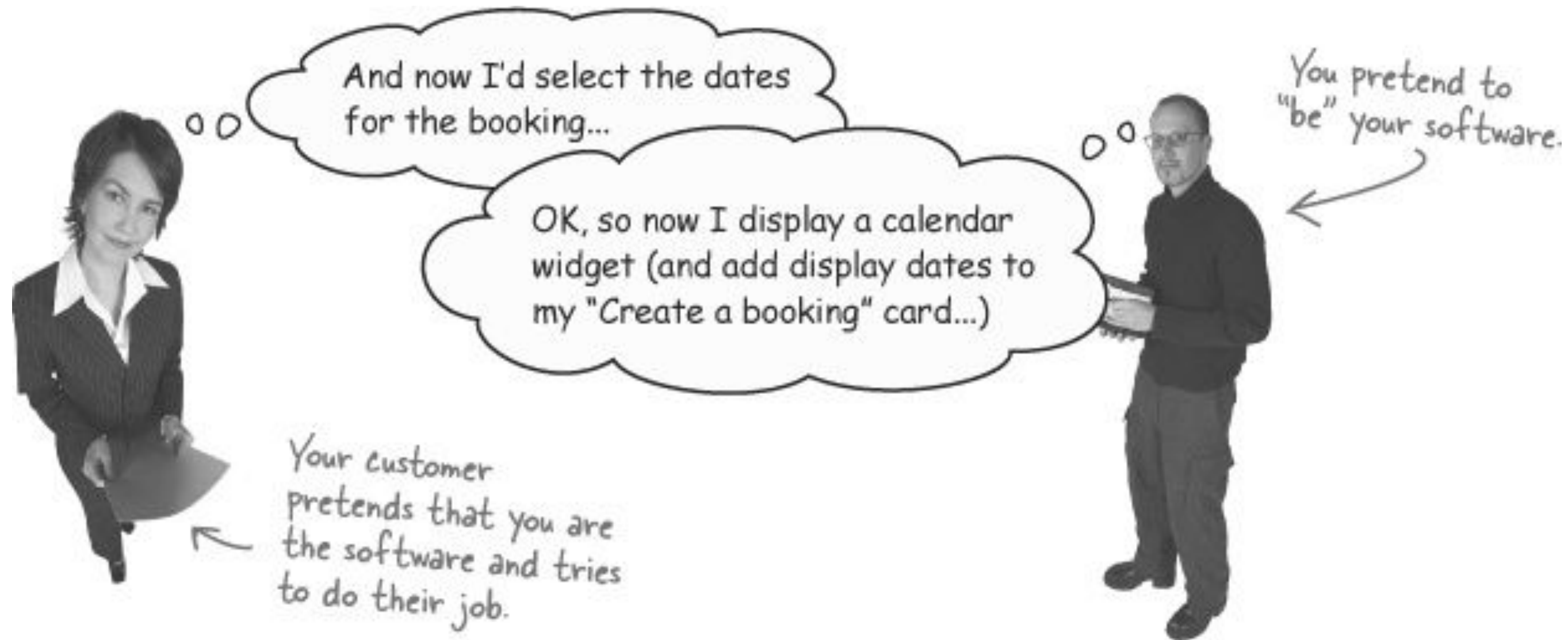


your eCards
someecards.com

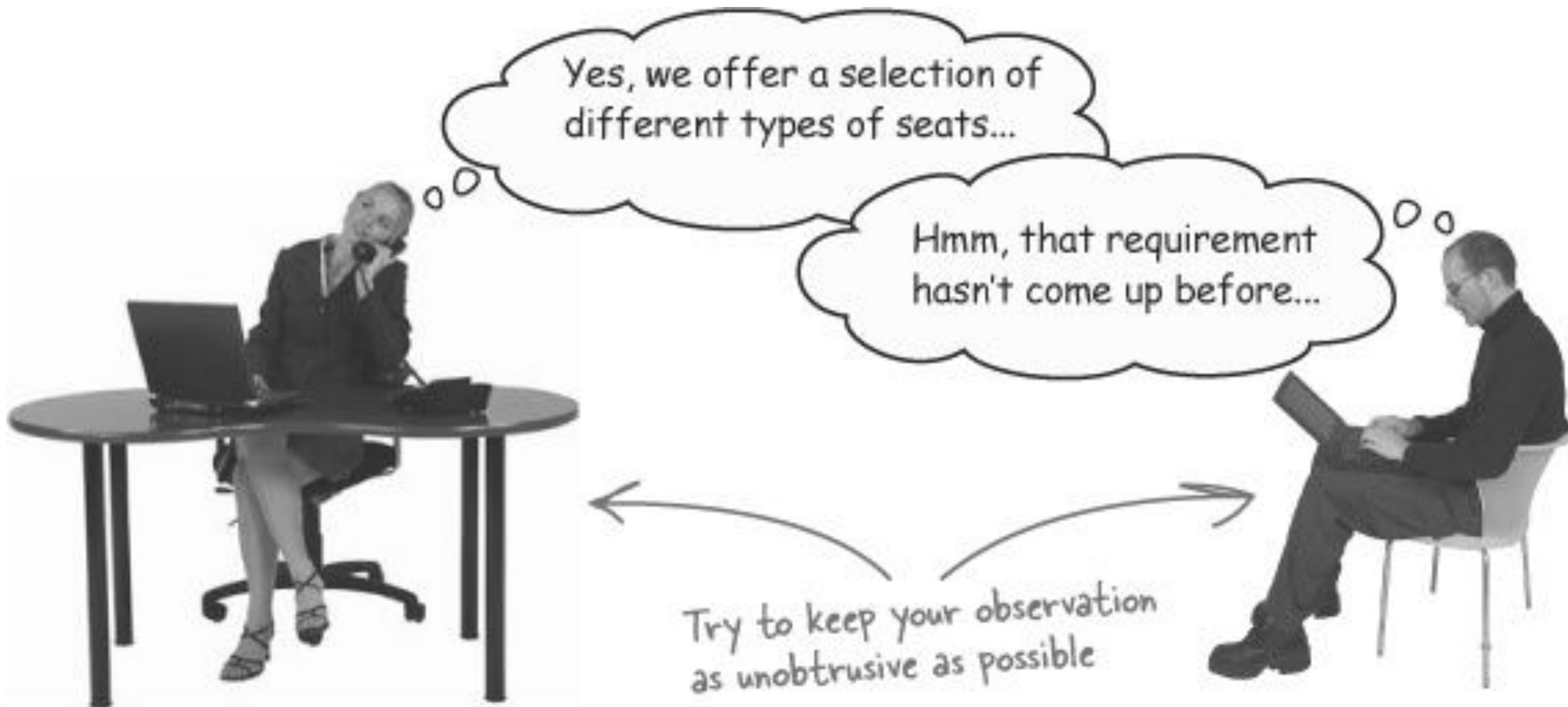


IT'S A TRUE... TRULY FUNNY OBSERVATION
imgflip.com

ROLE PLAY



OBSERVATION



REQUIREMENTS ELICITATION

The customer should be heavily involved

- Be sure all stakeholders are part of the process

Keep asking questions



REQUIREMENT ATTRIBUTES

Behavior
(required and
essential)

Priority

Status

Time Estimate



REQUIREMENT:BEHAVIOR

One thing the software should do

- Must be verifiable(def?)!
- Only attribute that is necessary/required



REQUIREMENT:BEHAVIOR

Written in language that the customer understand

- "user stories" [TEXTBOOK]

Be short



A nonfunctional constraint, but it is still captured as a user story

Title: Pay with Visa/MC/PayPal
Description: Users will be able to pay for their bookings by credit card or PayPal.

Title: Review flight
Description: A user will be able to leave a review for a shuttle flight they have been on.

Title: Support 3000 concurrent users
Description: The traffic for Orion's Orbits is expected to reach 3000 users, all using the site at the same time.

We've added to our cards from page 32 after the brainstorming with the customer.

Title: Order Flight DVD
Description: A user will be able to order a DVD of a flight they have been on.

Title: Order in-flight meals
Description: A user will be able to specify the meals and drinks they want during a flight.

Title: Book a shuttle
Description: A user will be able to book a shuttle specifying the date and time of the flight.

These were the requirements we came up with; yours could have been different.

Title: Choose seating
Description: A user will be able to choose aisle or window seating.

Title: Use Ajax for the UI
Description: The user interface will use Ajax technologies to provide a cool and slick online experience.

And we've added more detail where it was uncovered through brainstorming, role playing, or observation.

These are really looking good, but what's Ajax? Isn't that a kitchen cleaner or something?

The boss isn't sure he understands what this requirement is all about.



This requirement verifiable?

- True
- False

DILBERT by Scott Adams



Easy to Use

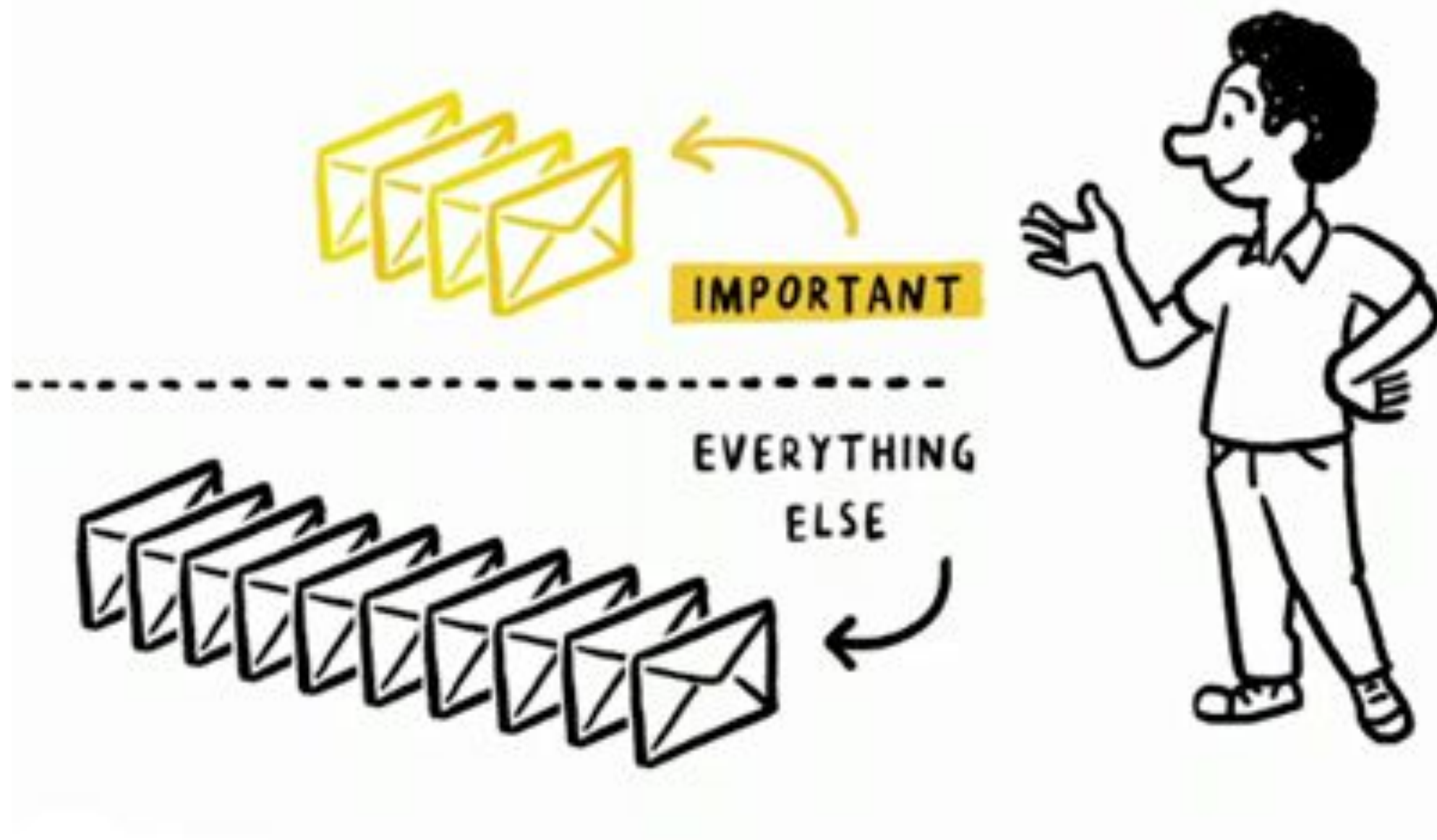
The software shall be
user friendly

Priority 5

2 days

REQUIREMENT:PRIORITY

Relative(?) to other requirements, how important is this requirement?



Q4U: WHO SETS THE PRIORITY OF A REQUIREMENT? WHY?

- A) User
- B) Client
- C) Software developer



REQUIREMENT:STATUS

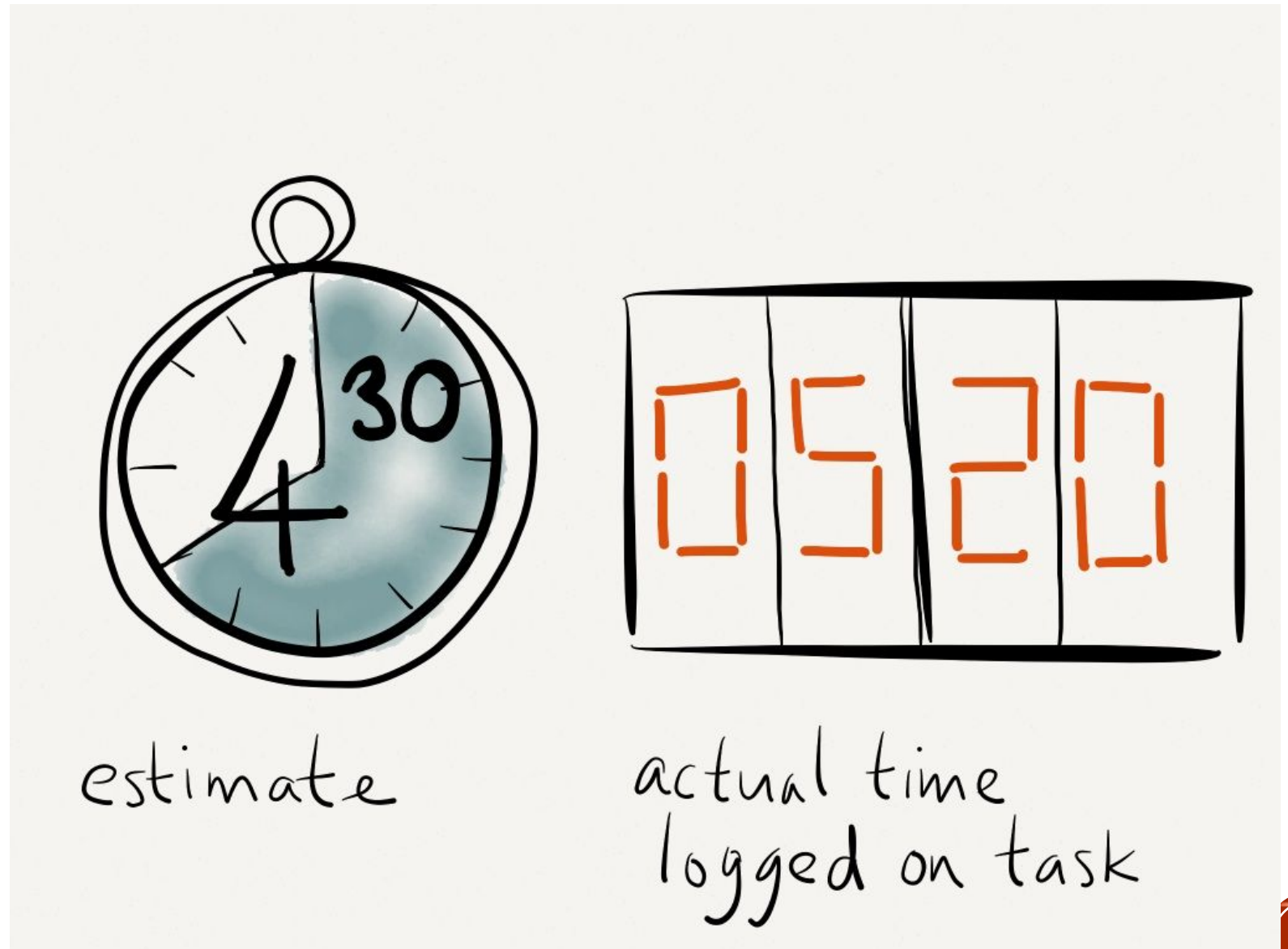
What is the status of this user requirement (more on this in coming weeks):

- waiting?
- in-progress?
 - updated time estimate?
- complete?



REQUIREMENT ATTRIBUTES

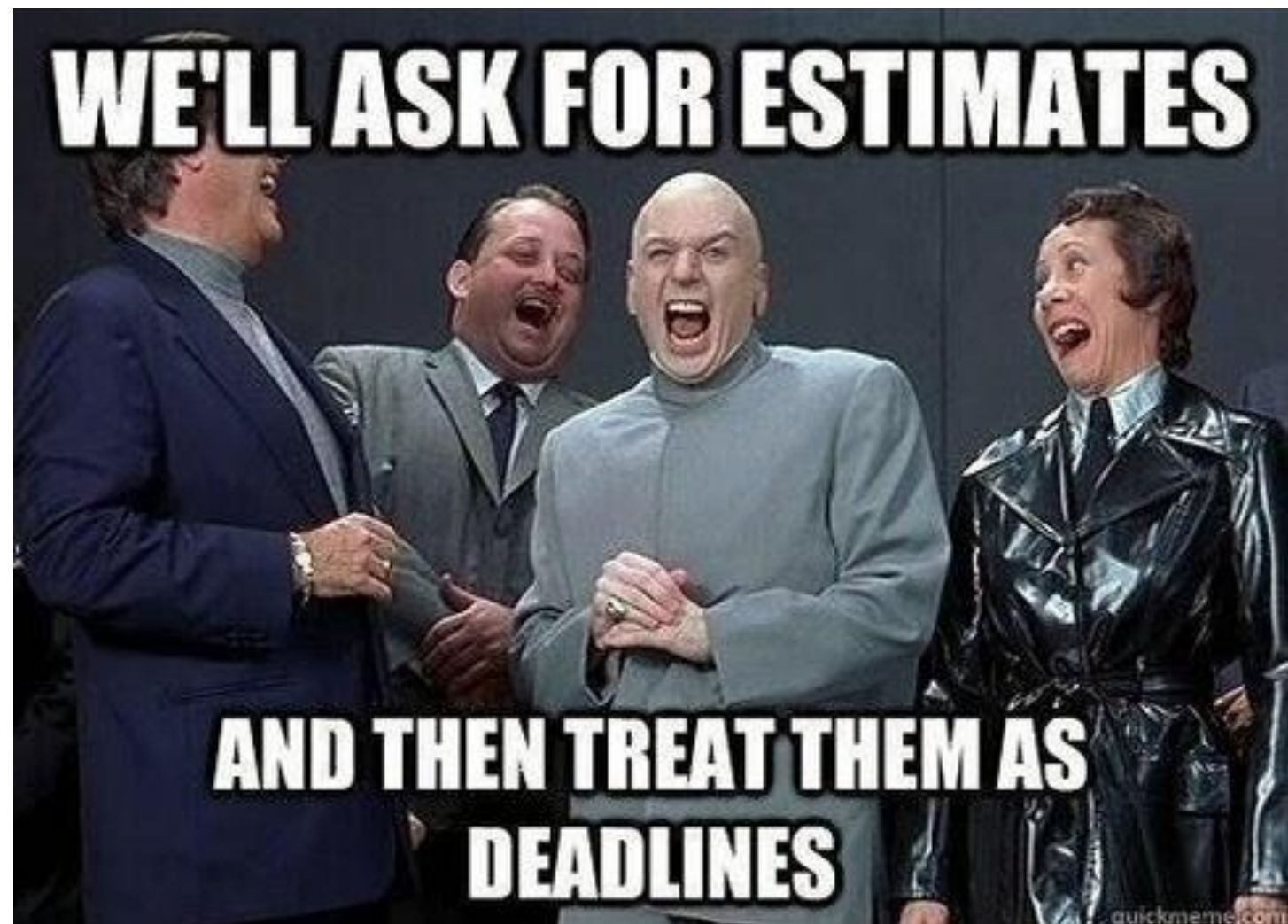
- A requirement may have multiple attributes including:
 - Behavior (required)
 - Priority
 - Status
 - Time Estimate



REQUIREMENT: ESTIMATE

Ask all software developers to estimate how long it will take to complete a requirement

- Days (TEXTBOOK prefers this)
- Hours



REQUIREMENT:ESTIMATE

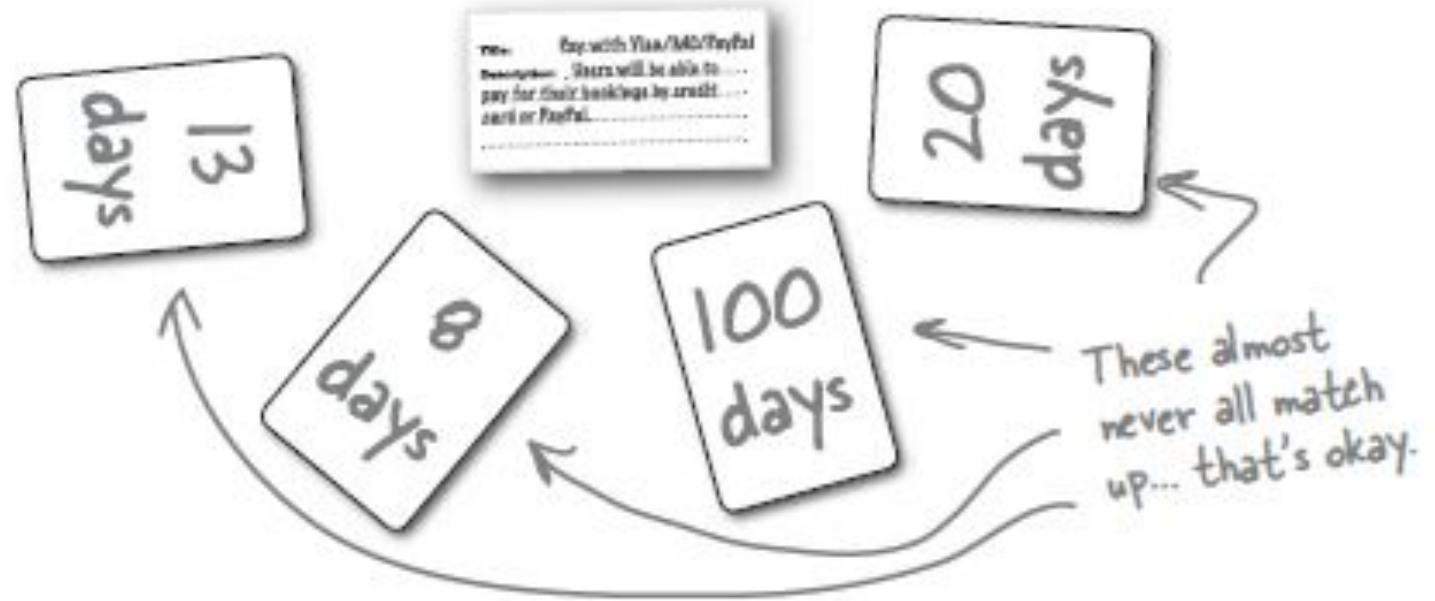
Among software developers (not the client) come as close as possible to a consensus

- Large differences in estimates may indicate a problem
- [TEXTBOOK] describes "planning poker" as an activity



PLANNING POKER

Place your choice
face-down so you
keep your estimate
from everyone else



It's probably safe to figure an accurate
estimate is somewhere in this range.



Ask the developer who played this
card what they were thinking
about; don't ignore them, try to
pull out the assumptions they made.

The larger the difference between the estimates, the less confident you
are in the estimate, and the more assumptions you need to root out.



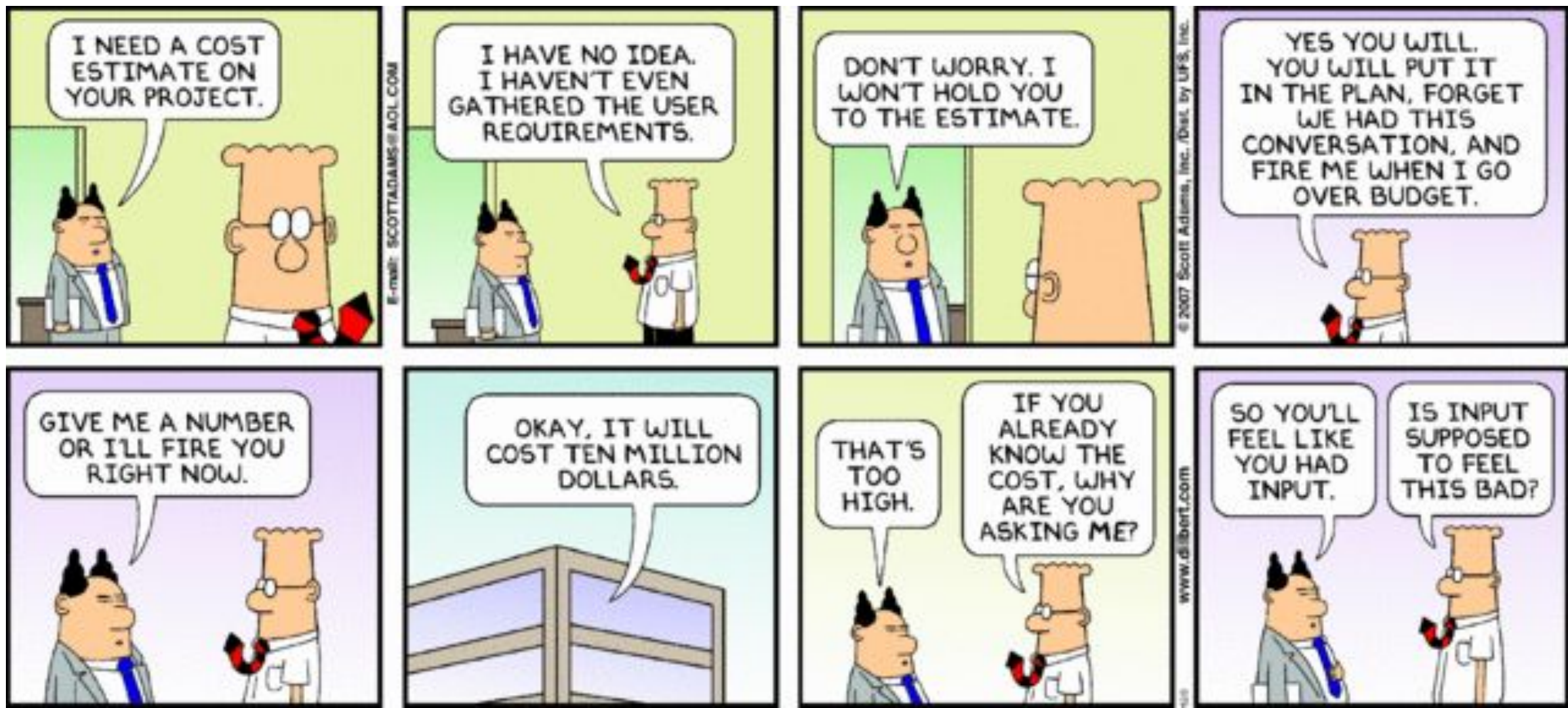
ACTIVITY 4A1



REQUIREMENT:ESTIMATE

Accuracy can be subverted by assumptions

- Eliminate assumptions whenever possible
- Surviving assumptions become **risks**



WHAT'S WRONG WITH THIS?

We all agree, we don't need any more information. This user story will take 40 days to develop...



YOUR USER STORY IS TOO BIG.

40 days is a long time, and lots can change. Remember, 40 days is *2 months* of work time.

Entire iteration should ideally be around **1 calendar month** in duration.

- Take out weekends and holidays, and that's about 20 working days.
- If estimate is 40 days for just *one* user story -> won't even fit in one iteration of development unless you have two people working on it!
- As a rule of thumb, estimates that are longer than 15 days are *much less likely* to be accurate than estimates below 15 days.



TOO BIG?

Break your stories into smaller, more easily estimated stories

- Apply the AND rule. Any user story that has an “and” in its title or description can probably be split into two or more smaller user stories.

Talk to your customer...again.

- Maybe there are some assumptions that are pushing your estimate up.
- If the customer could clarify things, those assumptions might go away, and cut down your estimates significantly.

Title: Choose seating.....
Description: A user will choose aisle or window seating, be able to select the seat they want, and change that seat up to 24 hours before the flight.

Title:
Description:
.....
.....
.....

Title: Order in-flight meals.....
Description: A user will choose which meal option they want, from a choice of three, and be able to indicate if they are vegetarian or vegan.

Title:
Description:
.....
.....
.....



ACTIVITY 4A2



EVENTUALLY WANT TO CONVERGE

RUN THROUGH THIS REQUIREMENTS CYCLE OF STEPS TILL YOU REACH A CONSENSUS

Talk to the customer

- First and foremost, get as much information and remove as many assumptions and misunderstandings as possible by talking to your customer.

Play planning poker

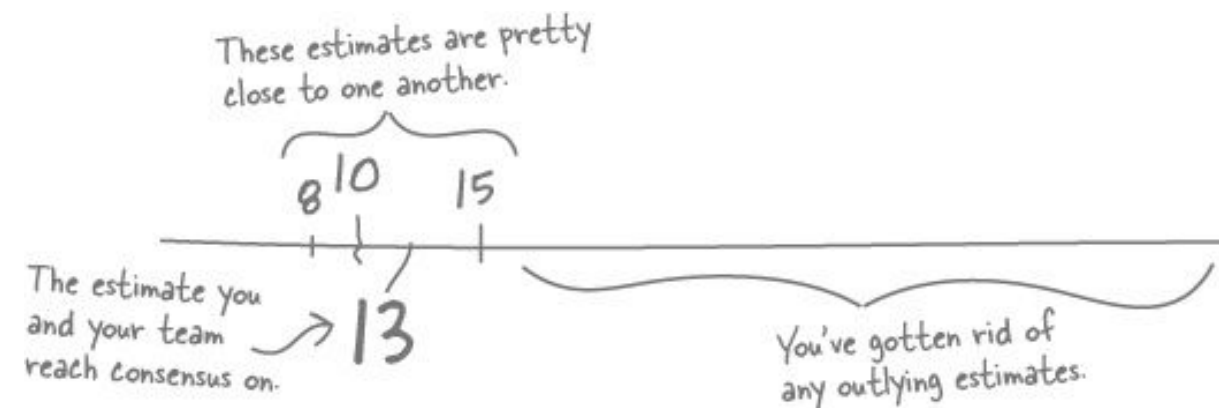
- Play planning poker with each of your user stories to uproot any hidden assumptions. You'll quickly learn how confident you are that you can estimate the work that needs to be done.

Clarify your assumptions

- Using the results of planning poker, you'll be able to see where your team may have misunderstood the user stories, and where additional clarification is needed.

Come to a consensus

- Once everyone's estimates are close, agree on a figure for the user story's estimate.



This requirement has assumptions

- True
 - False
-

Display Product Catalog

Output an HTML version
of the product catalog to
the user's web browser

Priority 5

2 days

REQUIREMENT:ESTIMATE

Add the estimates for all requirements for the project estimate

What if the project estimate is too long?



REQUIREMENT ATTRIBUTES - SUMMARY

Behavior
(required)

- What does it do?

Priority

- What order should we do it in?

Status

- Is it done? started?

Time Estimate

- How long will it take?



MAINTAINING TRACEABILITY

Where did the
requirement
come from?

Where is it
implemented?

Where is it
tested?



MAINTAINING TRACEABILITY NEEDED BY:

Developers

- Is the system complete?

Testers

- Does the system meet its requirements?

Designers

- What is the rationale behind the system?

Maintainers

- What is the likely impact of making a change?



AGENDA

Software
Development
Stakeholders

Software
Requirements

- Requirements Elicitation
- Requirement Attributes

