“I’m from KM, I’m here to help”

An adventure in best intentions

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The Technical Questions DB

Create a database of peer review questions for key laboratory technical disciplines

- Initiated in 1998 by upper management
- "Mind tickler" technical questions in disciplines applicable to flight projects
  - That could be asked during the design process or at a review
  - With the purpose of identifying and preventing problems
- Primary user: technical personnel working flight projects

Sample Question

Flight Software Question:

Do you have embedded test code in your flight sw?
If yes: Do you strip out the test code before final compile/delivery?
>If no: Can you inadvertently get into this code during flight?
>>If no: How can you be sure?
>>If yes: How does the code terminate?

Background:

Accidental running of test code that terminated by turning off all power was the responsible for the loss of the Russian Phobos spacecraft.

Reality Check #1

Pre-development discussion with cynical lunch-table crowd

- Desire Credible Sources:
  - **IF** the website contained questions from well-known (and respected) guru's such as … **THEN** it would be really valuable and they would go there
- Afraid it will make more work:
  - Requirement push-up exercise:"you must go to the site & prepare a response to every question in there"
  - If there are too many "questions", then the effort to use it is greater than the potential benefit. ("If I have to scan 50 one-liners, I could do that -- but if there's hundreds of questions, that's too much")
  - Take a lot of effort would to determine if a question relevant

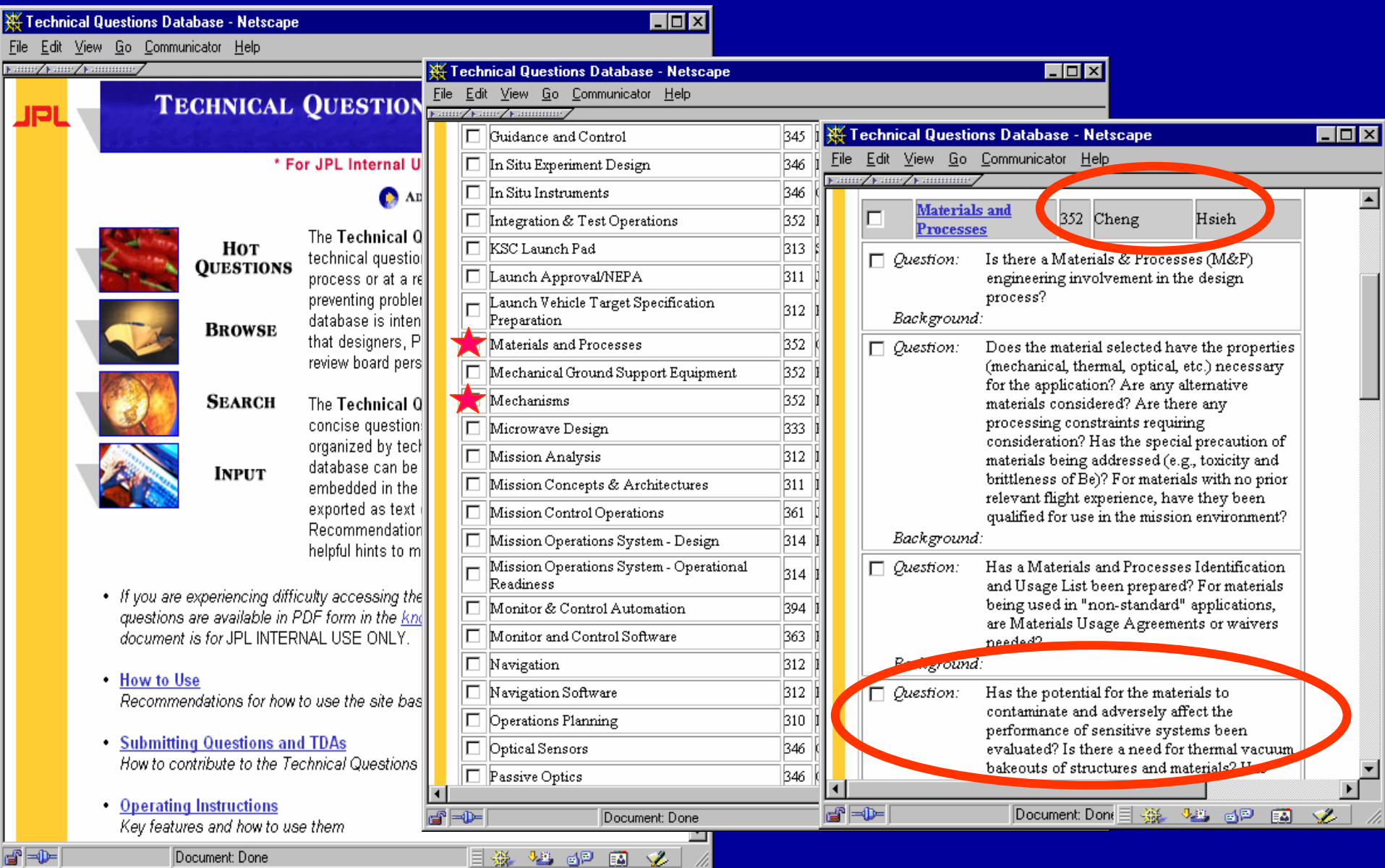
Reality Check #1 (cont)

- System requirements
  - Search, filter, sort, select based on topics and categories
  - Interesting and useful
    - Anecdotal DB of what went wrong
- Review board needs to filter questions to id appropriate, relevant ones for this specific project and specific review.

Technical Questions DB

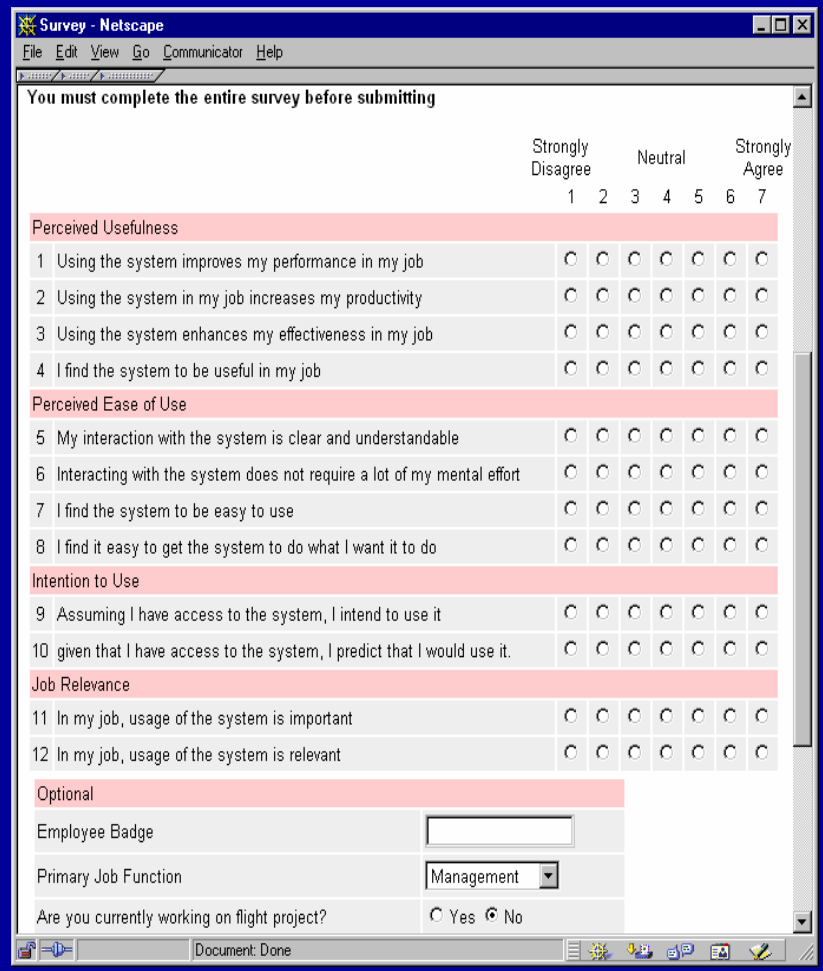
- Web-based system operational for internal JPL use
- 75 Technical Disciplines
- >700 Questions
- 20-50 users per month
- Low development cost
- Extremely low O&M

TQ DB Scenario



Reality Check #2

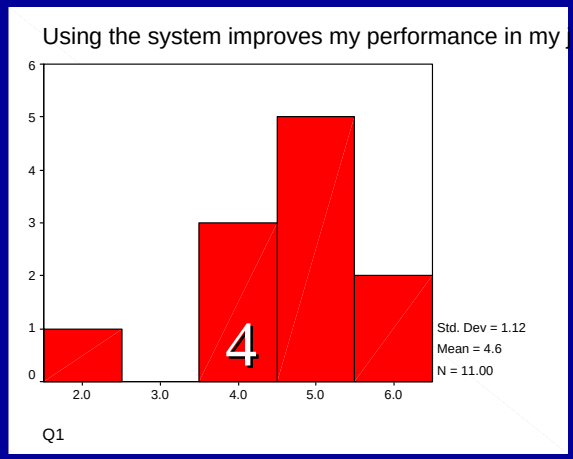
- On-line survey assessing Usefulness and Usability
- Going in "beliefs"
  - Minimal system implementation = perceived usability problems
  - Useful to individuals working flight projects
  - Marginal use to others

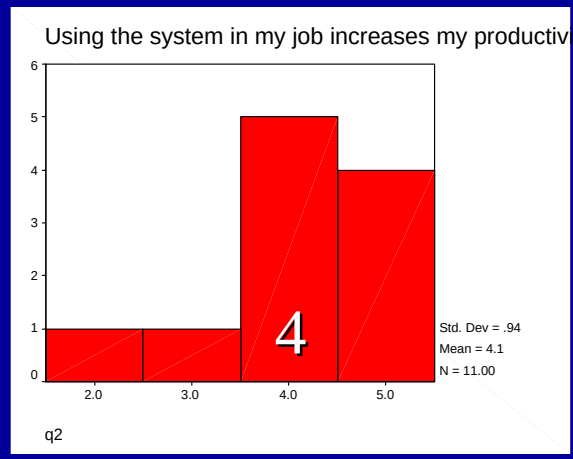


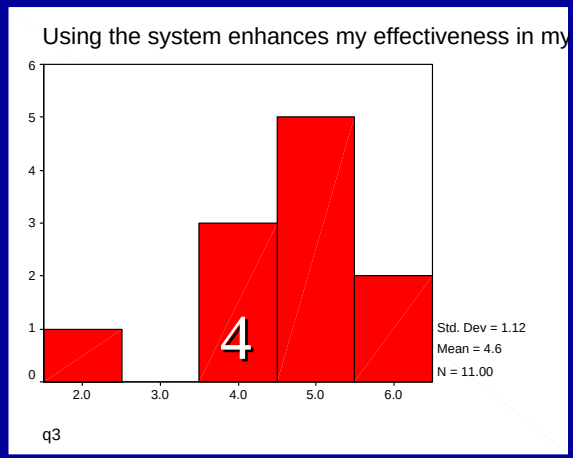
Survey Results

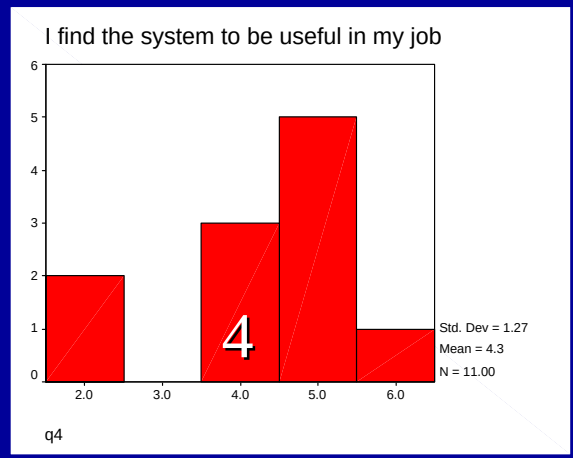
- Had to beg to get people to take survey
  - More email messages than survey responses
  - Despite small sample sizes, got reasonable data
- Mostly constructive feedback
  - Suggestions for content
  - Associated resources
    - "Here's the list of questions we use on …"
  - Suggestions (relatively few) on functionality
- One suggestion on how to better spend the $

Usefulness ✓OK (whew!)

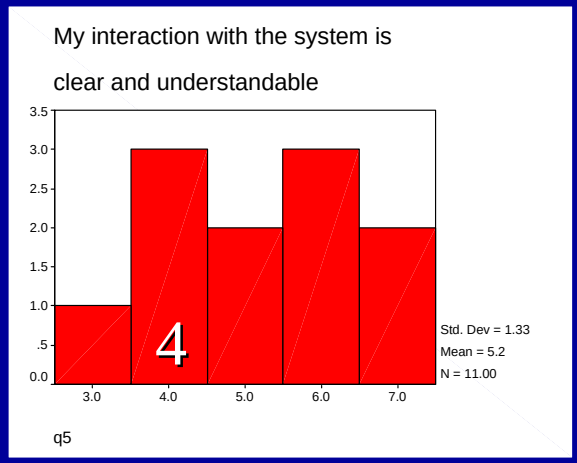


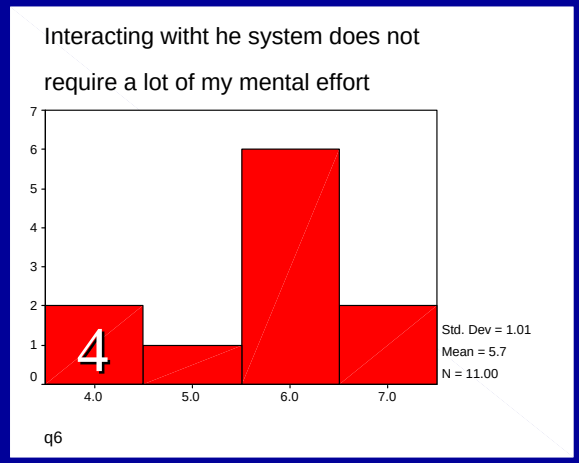


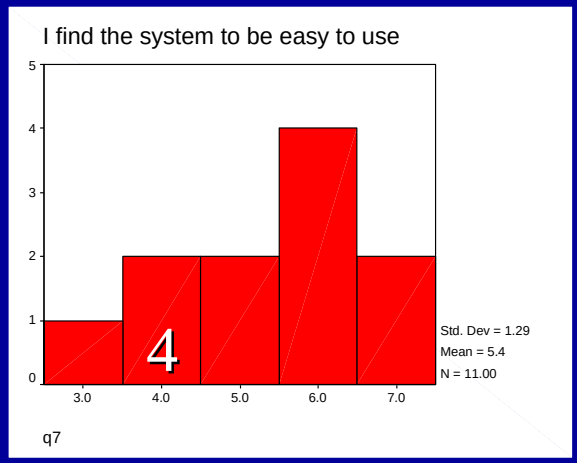


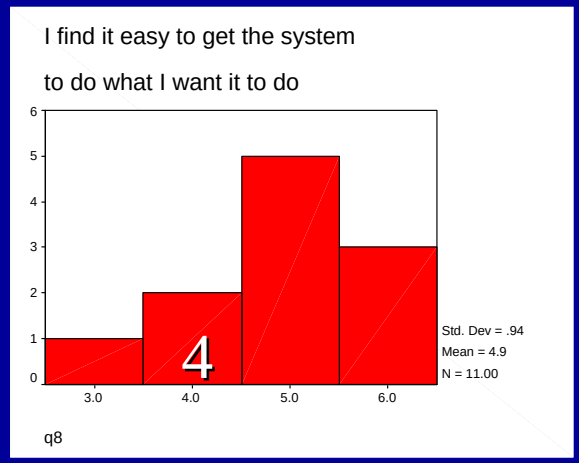


Usability ✓OK (!)









Intend to Use (???)

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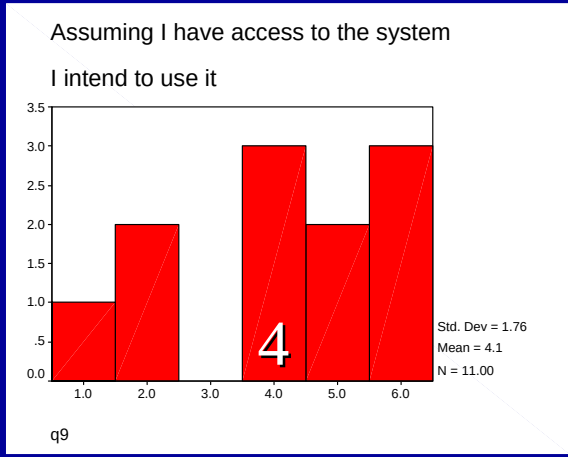
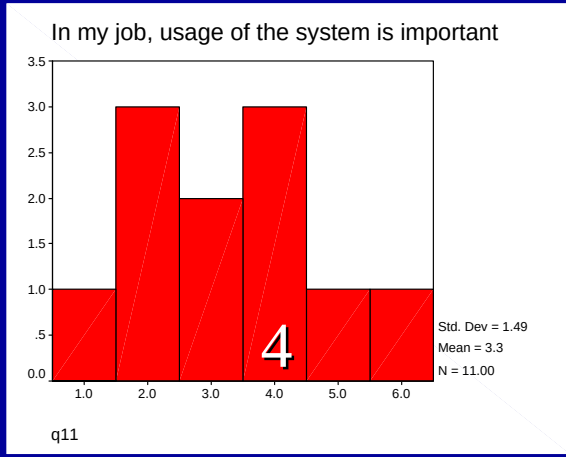
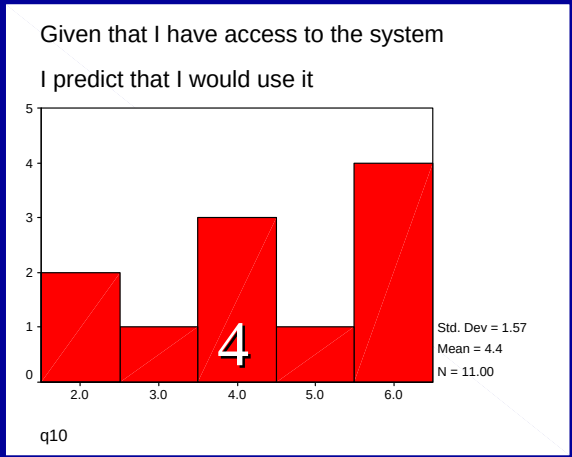


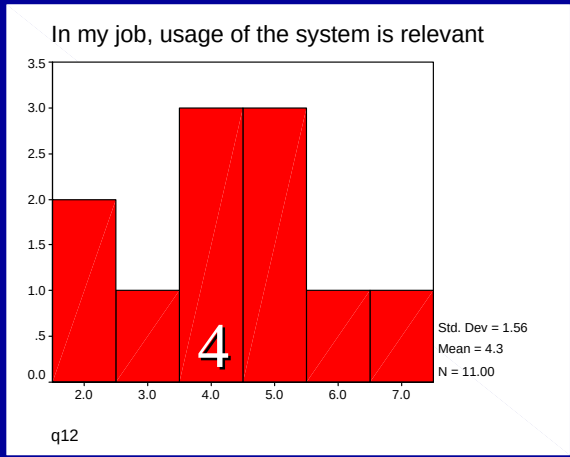
Important



Predict to Use



Relevant



From the Comments

- "List of questions could be intractable…"
- "We are overwhelmed with work and don't have time to use a system like this…we barely have time to get the highest priority work accomplished"
- "Not currently working toward a review…"
- "I didn't find anything in [my area of interest]"
- Would use
  - "...as a review board member"
  - "…if I were working on a flight project"
  - "…to locate the right people"
- "Useful but a bit cumbersome"

~Conclusions

- System functionality is good enough (bummer)
- Need to extend content to cover additional technical disciplines
- Primary users ARE NOT flight project personnel, not during design activities
  - Info most salient when approaching a review
  - Prefer to have information“chauffered”
    - Need to target Line Management, Experts, Review board members, QA/MA

Implications

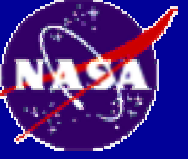
- For flight projects:
  - If people are too overwhelmed just doing their job -- they can't take advantage of risk-reducing knowledge
  - Need to have someone who's role is to seek out, evaluate, determine relevance of lessons learned type information (chauffering)
  - Project personnel benefit from combo of tidbits and contextual insights from informed reviewers
  - Reviewers benefit from checklists and reminders

Implications

- For tool developers
  - Good Enough just might be good enough
    - Users might not need the “bells and whistles”
    - Effort may be better put into content
  - Need to consider the way people work
    - Even a small delta to the workload may be perceived as “too much” in high stress situations
    - Actual users may be different from original target
    - JPLers used to “peer review” and inquisition → Questions OK
  - Doesn’t hurt to have upper management support
  - Pays to step back and evaluate before committing lots of resources

Future Reality Check

- Given just how context-dependent the usefulness of information is, and
- The sheer volume of “tidbits” applicable to any flight project
- When we create these resources (especially those based on “lessons learned’’)
- What are the implications of NOT using a resource that could have prevented a problem?



JPL

The End.