

Lessons Learned from
Architecture Reviews

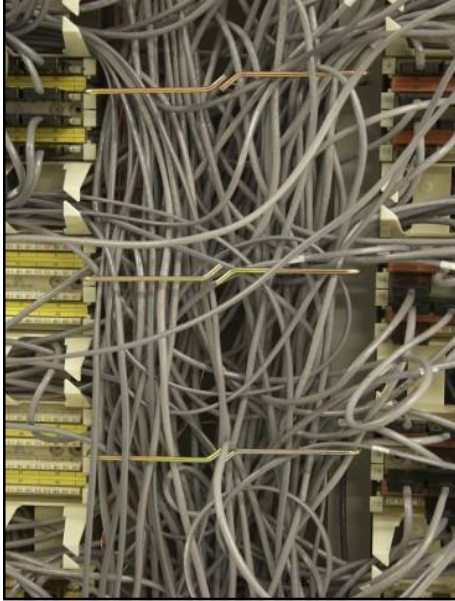
debate (dibāt'), *v.t.* to contend about
ments; to contend for; to discuss; to
cuss or argue a point; to engage in
sion of a question; an argumentative
debat

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Beware of the Technical Stack



Visualize the Benefits



Get the Right People Involved



“We suggest that several, realistic scenarios be written down, and agreed upon as representative by product marketing.”

Ask the Right Questions

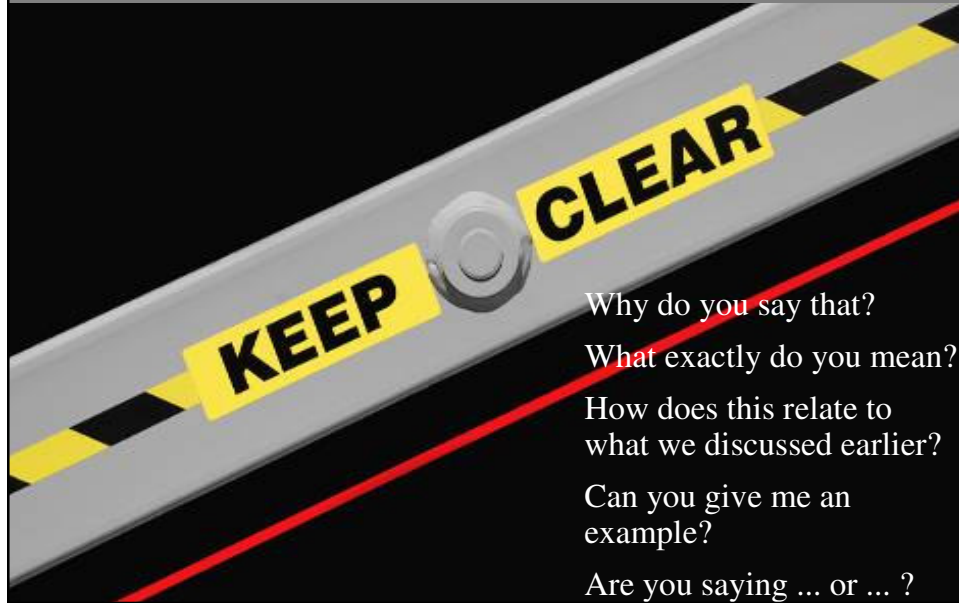


Probing Questions

Evaluation...how good do you think it will be
Accuracy...is that so
Completeness...is that all
Relevance...does this apply here
Purpose...why did you suggest that
Extension...tell me more



Clarifying Questions



Why do you say that?

What exactly do you mean?

How does this relate to what we discussed earlier?

Can you give me an example?

Are you saying ... or ... ?

Size the Review to the Architecture



Structure the review to “buy” the right information

Architecture Review Expectations

We'll mutually agree on what to assess and how it should be done

We'll set the stage and bring the right people together

We want you to tell us what you find: your concerns are, risks, and things we are doing right



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Reviewer's Expectations

Give me as much stuff as possible to set the stage

I'll come prepared to dig into issues you want me to explore, examine your architecture and design concerns

Informed people will give me guided tours

We will have an open, honest dialog

I'll make an honest, informed assessment



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Level the Playing Field

“Setting up an architecture review board has meant more balanced discussions. It makes managing easier.”



Five Really Hard Things



1. Dealing with Uncertainty and Risk



Risks Compound



“...any single technical aspect of the architecture isn’t high risk. However, the cumulative effect of several new technologies put the project at significantly higher risk.”

Ambiguity Effect



People favor a choice where there is a known probability over an option with uncertain probability

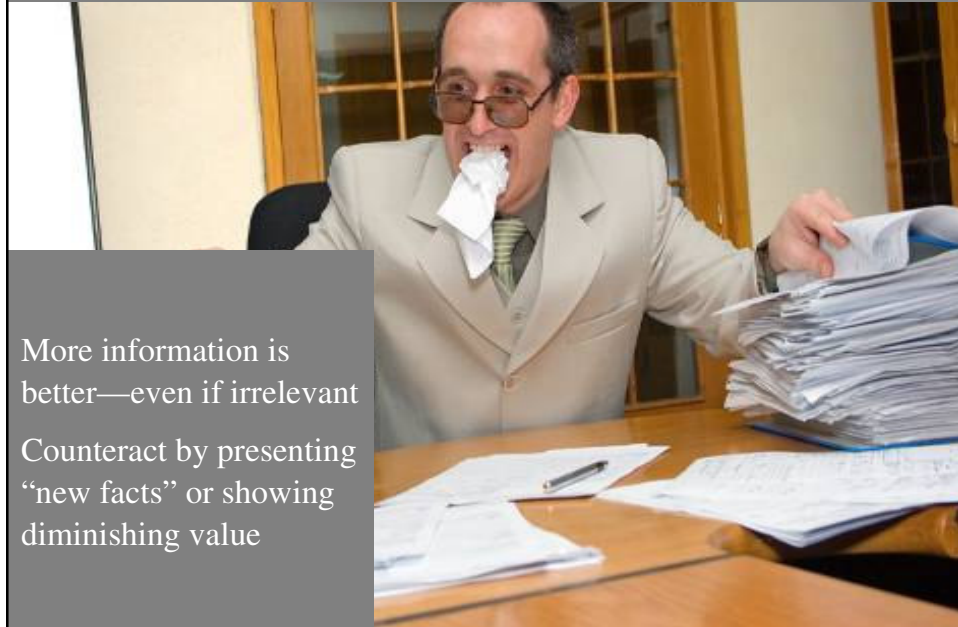
Neglect of Probability



In the face of uncertainty, some ignore it entirely, treating an uncertain future as being either 100% or 0% likely

Counteract by showing proof

Information Bias



More information is better—even if irrelevant
Counteract by presenting “new facts” or showing diminishing value

2. Merging Existing Systems



“Many hidden requirements are in the heads of support or buried in custom code.
There is no migration strategy.
The core of the architecture team is in CA while needed expertise is in PDX”

Sunken Costs Effect




People are reluctant to pull out of expensive investments
Counteract by presenting opportunity costs

Hyperbolic Discounting



People prefer smaller, more immediate rewards over larger rewards promised in the future

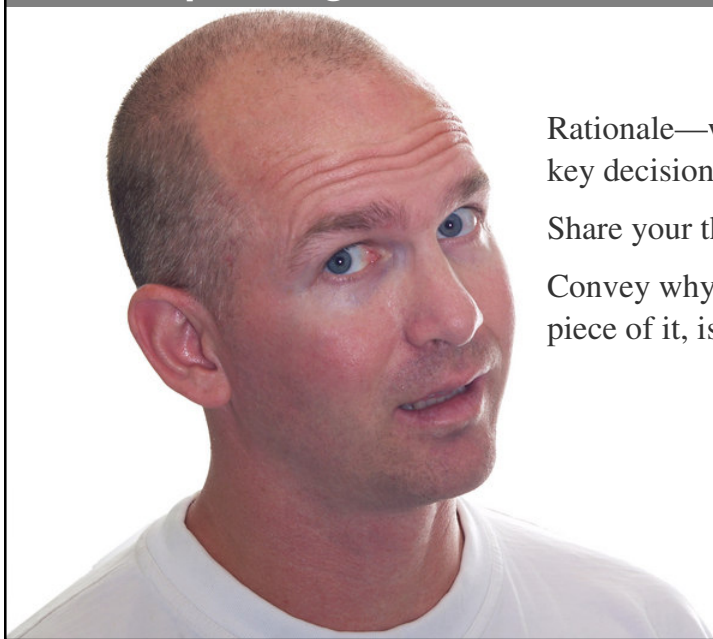
Tough to counteract



3. Describing Architectural Decisions

“As much as we may want to withdraw into a world of pure problem solving, we have to acknowledge that the most successful architectures are the ones you can actually convince someone to implement.”
—Jesse J. Garrett²¹

Explaining Architectural Decisions



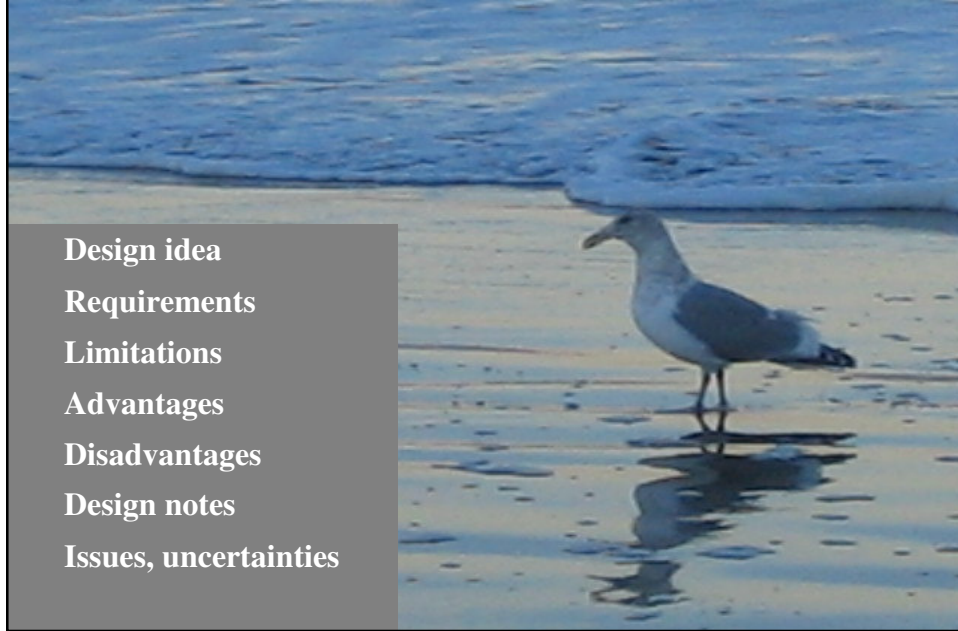
Rationale—why you made a key decision

Share your thought process

Convey why your design, or a piece of it, is a good solution

Explaining Decisions to a Constructive Reviewer

Design idea
Requirements
Limitations
Advantages
Disadvantages
Design notes
Issues, uncertainties



Explaining Decisions to a More Critical Reviewer

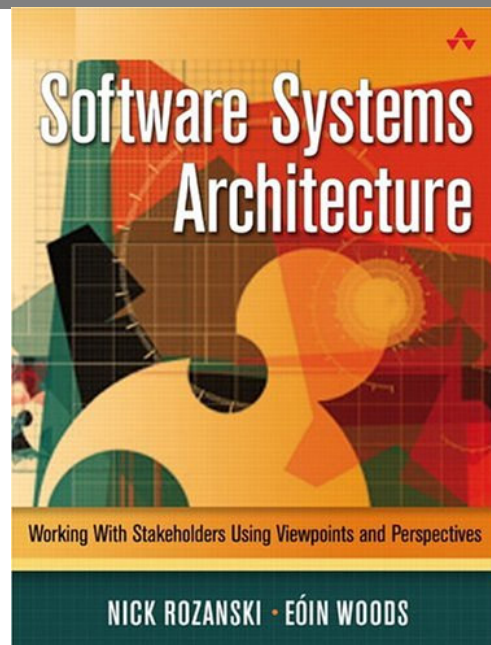
Decision

Constraints

Alternatives: Options you considered and reasons for ruling them out. Reasons need not be technical

Effects: Who will be impacted and in what way

Evidence: Confirmation the decision is good



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4. Overcoming Cognitive Biases



Making Tradeoffs version 1

Option 1: One Large Transaction

- Can't handle optimistic lock exception
- + Can batch updates
- + Can handle validation business logic
- Can only rollback entire transaction

Option 2: Split into many smaller transactions

- Can't batch updates
- Slower performance
- + One set of code
- + Partial failure easier
- + Rollback code could update db
- Cannot use first level Hibernate cache
- + Could run small transactions in parallel but...
- Added complexity getting partial results and setting up txns



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Information Availability




To increase information availability make it
Recent
Vivid
Easy to imagine



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Information Availability



To decrease it, make information
Complex
Uncomfortable

Making Tradeoffs version 2

Option 1: One Large Batch Transaction

- + 20x faster than split transactions
- + Can use Hibernate cache
- + Can only rollback entire transaction

Option 2: Split into many smaller transactions

- Slow performance
- Can't batch updates
- Cannot use first level Hibernate cache
- + Partial failure possible
- + Optimization possible
 - Could run small transactions in parallel but...adds complexity of handling partial results and setting up txns



Primacy and Recency Effects

People remember what they hear first and what they are told last

To get people to remember specific things, state them first, and summarize key points



Making Tradeoffs version 3

Option 1: One Large Batch Transaction

- + 20X faster than split transactions
- + Simpler batch code
- Can only rollback entire transaction
- + Can use Hibernate cache

Bottom line: Significantly greater batch performance with simple txn logic

Option 2: Split into many smaller transactions

- 20x slower
- + Optimization possible by parallelizing txns
- Optimization complex
- + Can support partial failure (but recovery semantics unclear)
- Cannot use first level Hibernate cache

Bottom line: Performance is significantly slower. Some optimization possible with extra dev. time



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Ways Reviewing Can Go Awry

Someone ...

Argues that one choice, if repeated will lead to chaos and ruin

Brings up something else extremely interesting

Keeps changing focus

Spouts off useless platitudes

Thinking

“One of the most important steps towards becoming a better thinker is being able to identify the various moves in argument and this is made much easier when you have names to attach to them.

—Nigel Warburton, *Thinking from A to Z*

Nigel Warburton

FROM

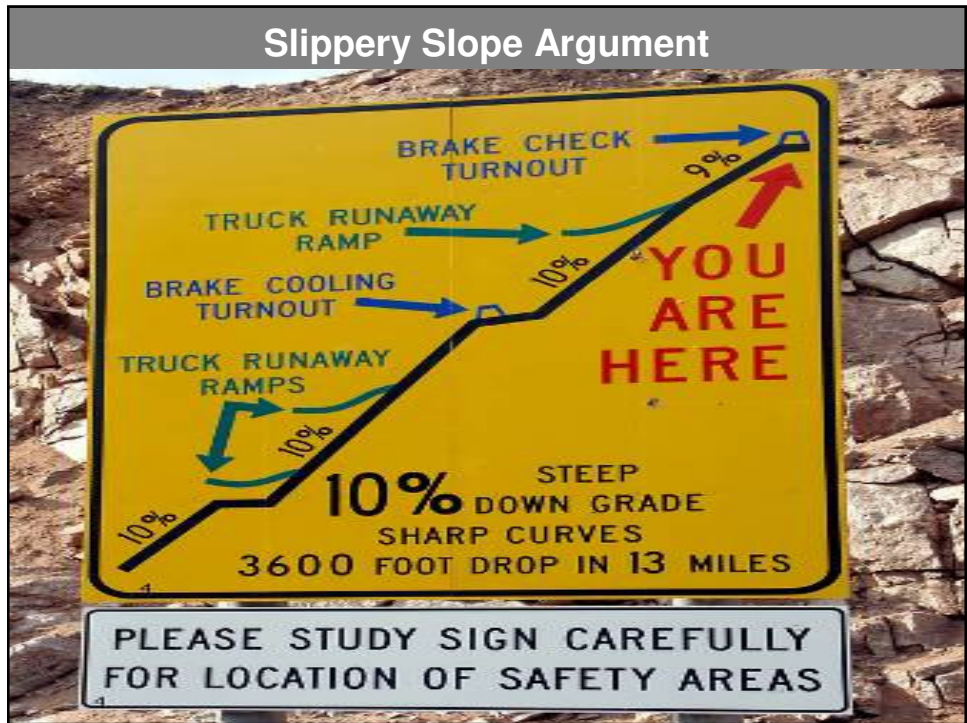
A

TO

Z

SECOND EDITION

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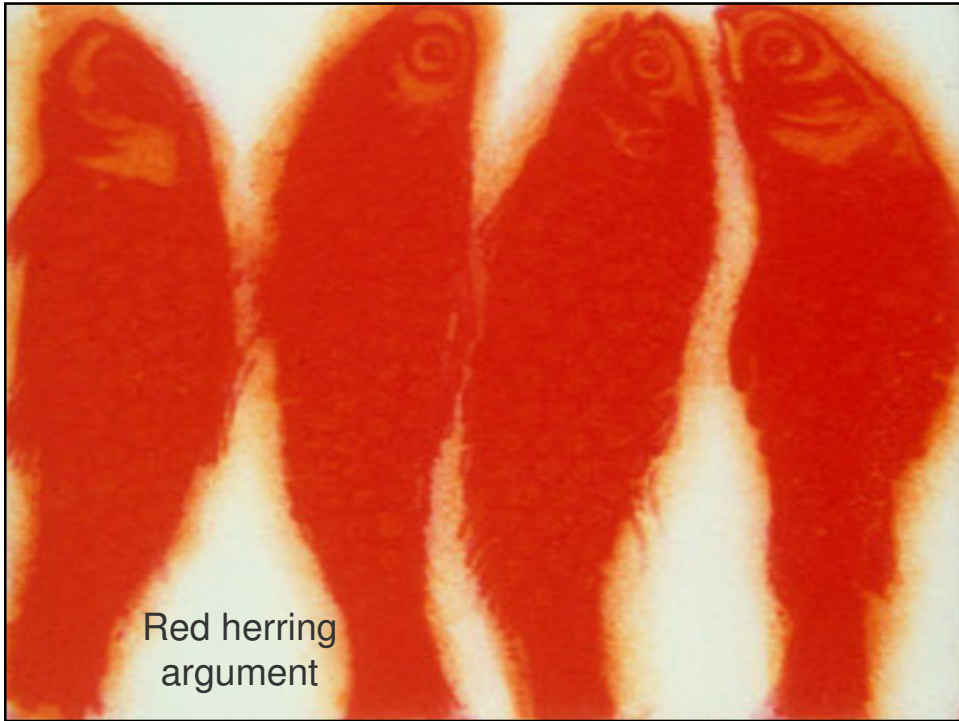


Shifting the goal posts argument



False dichotomy argument





5. Giving Advice



Advice Impact



A "triage" mentality helps focus energy and efforts

Keys to Persuasion



Be heard
Compare what you say to previously held views
Reconcile with contrary views
Agree with you

Common appeals...

Emotion
Fear
Novelty
Standard practice
Authority

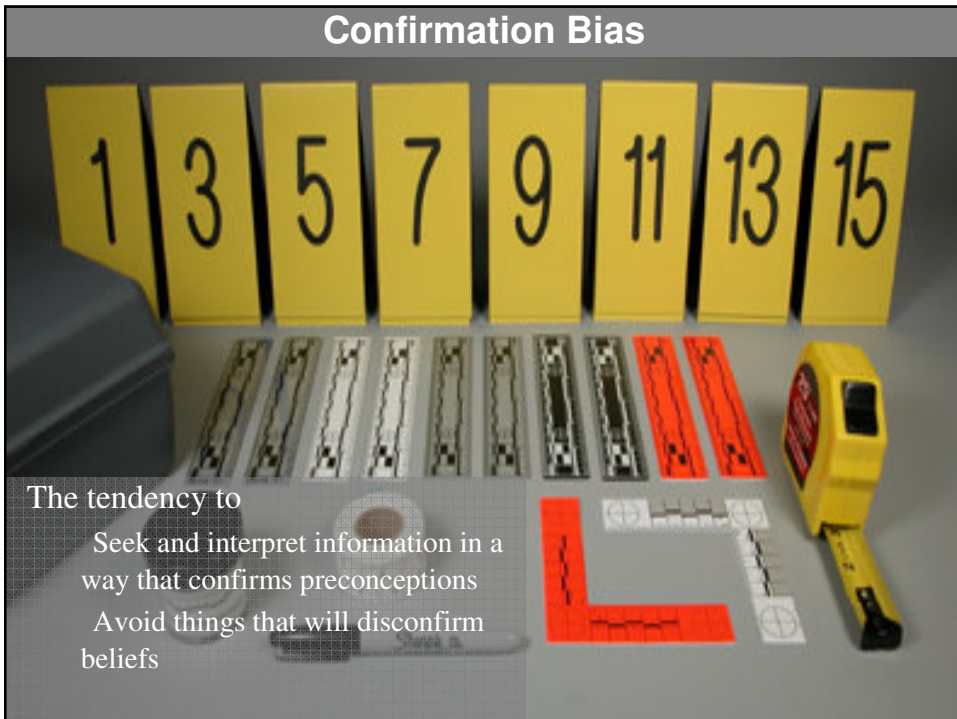


Anchoring



People often rely on one trait or particular piece of information

Confirmation Bias



The tendency to

Seek and interpret information in a way that confirms preconceptions

Avoid things that will disconfirm beliefs

Processing Evidence

Each piece of evidence adds towards a decision



Evidence has a disproportionate incremental effect when it is surprising

Contrast Effect



People can't avoid comparing items against each other rather than against a fixed standard

Thank you

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