Open Questions for Open Models

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My View of Open Models

- **Open Models** are (conceptual) models that express a ***shared*** and ***stable*** view of the ***concepts in a domain*** to be supported by an information system that are ***intended to be (re)used in new contexts and applications***

Important Assumptions of Open Modeling

1. There can be a shared understanding of a domain expressed as abstract classes
2. Domain does not change quickly or radically
3. Adapting models for new uses is unproblematic

Challenges to Assumption 1

- Shared understanding depends on a top-down (“legislated”) approach
- Cognitive theories demonstrate there is no reason to assume a shared understanding is always meaningful (in general)
- Limits of schema integration research

Example

- **What is a “product”?**
  - Design perspective
  - Manufacturing perspective
  - Marketing perspective
  - Accounting perspective
  - …

Challenges to Assumption 2

- **Stability is rare(r) in organizational settings**
  - Changing competitive situation
  - Changing regulations
  - Changing technology
  - Emerging “open” environments, such as crowdsourcing
- **Change renders shared models obsolete**

Example 2

- Evolution of entertainment delivery

Spotify®

Challenges to Assumption 3

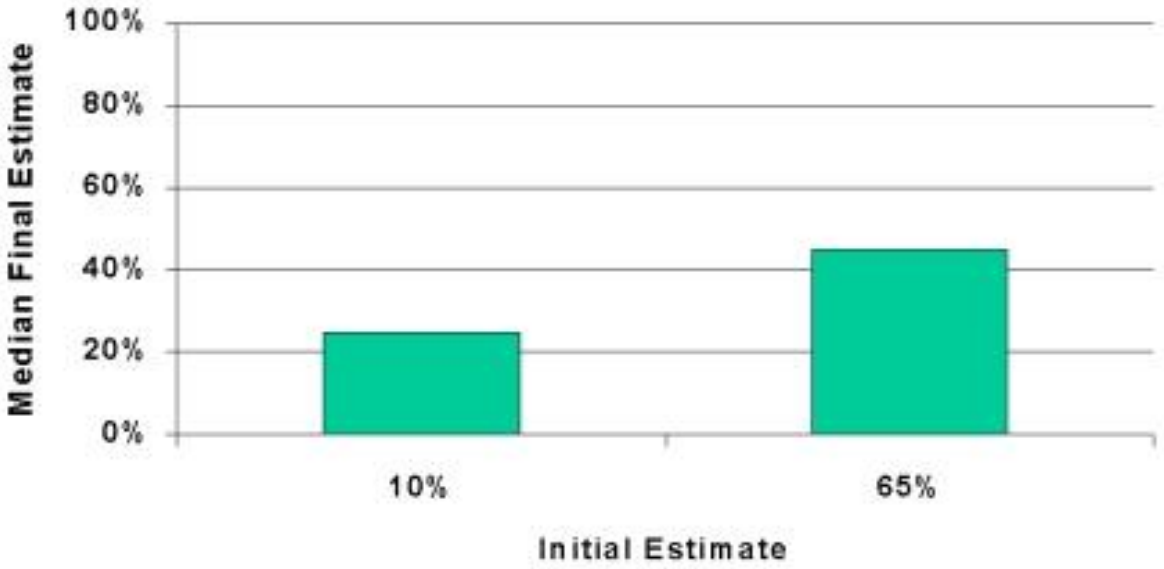
- **As requirements change, models must be updated accordingly**
- **Modelers exhibit *cognitive biases***
  - ***Anchoring and adjustment*** may lead to inadequate changes to models

Example 3

- **What percentage of UN nations are African?**
- **Estimates were influenced by numbers appearing on a “fixed” roulette wheel**
  - 10
  - 65

African Countries in United Nations

Tversky & Kahneman (1974)



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Example from Conceptual Modeling

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Cognitive Heuristics in Software Engineering: Applying and Extending Anchoring and Adjustment to Artifact Reuse

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Abstract—The extensive literature on reuse in software engineering has focused on technical and organizational factors, largely ignoring cognitive characteristics of individual developers. Despite anecdotal evidence that cognitive heuristics play a role in successful artifact reuse, few empirical studies have explored this relationship. This paper proposes how a cognitive heuristic, called *anchoring*, and the resulting *adjustment bias* can be adapted and extended to predict issues that might arise when developers reuse code and/or

A Way Forward

- **Relax requirement to model using abstract concepts**
  - Class-based abstraction is user- and use-dependent, limiting “openness”
  - Instance-and-attribute abstraction support flexibility for adaptive reuse