

EM.413 Opportunity Set 13 – System Architecture Common Failure Modes

Question 1

- Decisions are selected that no one would reasonably call "architectural" (e.g., color, leather, wheel diameter)
- Decisions relate to a process, not the architecture.
- Decisions applied to non-technical aspects.
- Too many decisions focus on form; very few/no decisions on form-function mapping.
- Misclassification of function decisions as form decisions or vice versa.
- If architectural decisions were made since the list in OS11, no explanation of the rationale for those decisions.
- Options are not mutually exclusive or awkwardly framed to make them appear so.
- Confusing an outcome of the system (emergence) with architectural decisions (e.g., "should it be easy to use or not").
- Mixing architectural decisions with scope, scenarios, intent, goals, metrics, or requirements.
- Decisions that aren't within the architect's control.
- Decisions aren't sensitive or connected.
- Too many decisions to possibly all be architectural in nature (e.g., more than 10).

Question 2

- No framing of past designs using a list of architectural decisions.
- No reflection on the Product / System as a member of one class of architecture.
- No articulation of how the future solutions may improve past designs.
- Misclassification of small (design-level) changes between past designs as architectural.

Question 3

- Tradespace is missing any of the following:
 - Utopia point
 - Pareto front (either missing or not drawn correctly)
 - Insufficient architectures (<5)
- No tension between the axes of the tradespace (they are co-variant, showing essentially $y=x$)
- Tradespace anchors a favorite (all other architectures are just +/- 1-2% difference in metric values)
- Metrics evaluation not credible (e.g. complex system price less than \$1M)
- Metrics not evaluated for a past design
- The two metrics chosen weren't explained (especially if it is an aggregated metric like "utility") and/or metrics don't seem to be reasonable for the context

- No clearly explained method to generate the 5-10 architectures
- No clear driving architectural decision emerges (either through color-coded points or otherwise)
- Tradespace attempts to show too many architectural decisions and is unreadable : as a rule 1, maybe 2 decisions should be illustrated with colors and / or point shapes, per tradespace.
- No discussion or analysis of the tradespace

Question 4

- Decompositions aren't meaningfully different from each other (they are too locked in on one view)
- Decompositions use overly generic wording without being "solution neutral."
- Incorrect classification of "function."
- No clear statement of what decomposition the team prefers
- No or insufficient explanation of the team chose the decomposition they chose
- No explanation of how the Level 2 of the decomposition informed the Level 1 (2 down, 1 Up)

Question 5

- No explicit choice (platform strategy – yes or no?)
- If the team chose a platform strategy:
 - No explanation of why
 - No discussion of what variety is demanded by the market, what variety is not demanded by the market or why that variety cannot be served without a platform strategy
 - Attempting to cover the whole market (should cover segments, not the whole market)
 - Citing both cost savings and revenue as strategic goals
 - Platform strategy framed as a "best practice"
 - No discussion of the investment required for the platform or the drawbacks that would be required (platform premium, overperformance, etc).
- If the team didn't choose a platform strategy:
 - No explanation of why
 - No discussion of what variety is demanded by the market
 - No discussion of architectural stability
 - No discussion of how to approach product/system evolution