Facilitating the Mini-Quality Attributes Workshop
A Lightweight, Architecture-Focused Method

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What happened?

We didn’t pay enough attention to the right architecture drivers.

(especially quality attributes)
Quality Attribute

Benchmarks that describe a system’s intended behavior within the environment in which it was built.

Requirement that specifies criteria that can be used to judge the operation of a system, rather than specific behaviors.


Let’s start doing QAWs!

Structured, repeatable method!

Clarify priorities and trade-offs!

Buy-in from stakeholders!

The right drivers right, up front!
Customers don’t want QAWs…
We needed a workshop that was…

Fast
Repeatable
Relatable
Trainable
Reliable
Something our customers would want to do…
THE MINI-QUALITY ATTRIBUTES WORKSHOP
The Traditional QAW

1. QAW Introduction
2. Business/Mission Presentation
3. Architectural Plan Presentation
4. Identification of Architectural Drivers
5. Scenario Brainstorming
6. Scenario Consolidation
7. Scenario Prioritization
8. Scenario Refinement
Keep everything that is awesome about the QAW, but optimized to promote:

- Speed
- Repeatability
- Relate-ability
- Train-ability
- Reliability
- Desirability
The Traditional QAW

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Keep it short
The Traditional QAW

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Keep it short
Skip
Modify
Homework
Mini-QAW Agenda

1. Mini-QAW introduction
2. Introduction to quality attributes, quality attributes taxonomy
3. Scenario brainstorming
   • “Walk the System Properties Web” activity
4. Raw Scenario prioritization
   • dot voting
5. Scenario Refinement
   • While time remains, remainder is homework
6. Review results with stakeholders
QUALITY ATTRIBUTES
TAXONOMY
Classification of common quality attributes relevant to typical stakeholder concerns.
Taxonomy Benefits

Ready starting point
Constrain exploration space
Checklist for design
Traceability to patterns, practices
Quickly educate customers
Concrete guide for facilitation
Same Properties, Different Systems
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WALKING THE SYSTEM PROPERTIES WEB
Walking the System Properties Web Activity Overview

- **Goal**: Guide stakeholders in identifying highly desirable system properties and specifying them as scenarios.
- **Who**: Key stakeholders
  - project managers, IT, user champions, subject experts, development team
- **Outcome**: Raw quality attribute scenarios
- **Timeframe**:
  - Depends on stakeholders, risk, complexity
  - Timeboxed activity, ends when time runs out
Objective: Identify and prioritize raw quality attribute scenarios.

Time Limit: [30 minutes to 2-3 hours]

Guidelines and hints:
- Put the sticky close to related attributes
- Don’t worry about creating formal scenarios
- Think about stimulus, response, environment
- What are you worried about?
- Watch out for features and functional requirements!
Two Ways to Walk the Web…

Structured Brainstorming
Taxonomy Questionnaire
Structured Brainstorming - Overview

• **Process**
  – 3 - 5 minutes Ideation using any method (e.g. silent, round robin, etc) + time for refinement
  – Capture ideas directly on the properties web

• **Pros**
  – Fast – About 30 - 45 minutes for raw scenario generation

• **Cons**
  – May leave areas unexplored
  – Requires experienced stakeholders
Taxonomy Questionnaire - Overview

• Process
  – Introduce each quality attribute
    • “Is this quality attribute relevant to your system?”
    • Yes – ask follow up questions
  – When time runs out, the activity is over

• Pros
  – Thorough, very repeatable

• Cons
  – You need a taxonomy
  – Workshop runs longer (allow ~2+ hours)
  – Facilitator must listen closely and help “tease out” scenarios and concerns
Availability

Availability refers to the uptime of the system, that is how often the system is available and under what conditions the system might be allowed to be unavailable. Key concerns for this quality generally deal with up time, the projected system load and how the system responds to that load. Availability should be considered from both the crawl and query perspectives.

1. Are there any SLAs around availability of the system?
2. Are there defined maintenance windows where OS patches are applied, backups are performed, etc?
3. Are there requirements around QPS and/or crawl times?
4. Is there a load balancer in place?
5. Are there backup systems for the data repositories?
6. What is the maximum latency for data that is not “fresh”

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Prioritize using Dot Voting

• **Process**
  – Participants vote for highest priorities
    • 2 dots for quality attribute
    • $n / 3 + 1$ dots for scenarios where $n = \#$ scenarios

• **Pros:**
  – Fast, visual
  – Everyone has an opportunity to weigh in

• **Cons**
  – Voting on raw scenarios can be confusing (but it is important for prioritizing refinement effort)
  – Be aware of “lobbying” by bossy stakeholders
  – Not necessarily the final scenario priorities
Mini-QAW Agenda

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**Formal Quality Attribute Scenario**

**Source**: Who/what initiates the scenario

**Stimulus**: The event that initiates the scenario

**Environment**: The system or environmental conditions (e.g., normal operations, shutting down)

**Artifact**: Which part of system, or whole, is involved

**Response**: What noticeable event happens as a result of stimulus

**Response Measure**: Quantifiable, testable measurement
Quality Attribute Name

Raw scenario summary here…

Based on work by Rebecca Wirfs-Brock, Joseph Yoder
**Availability**

**Raw Scenario:** In the event of hardware failure, search service is expected to return results during normal working hours for US services representatives.

**Example**

Failed search server

<table>
<thead>
<tr>
<th>Source</th>
<th>Artifact</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>User</td>
<td>Search service</td>
<td>Returns results</td>
</tr>
</tbody>
</table>

**Stimulus:**
- User executes a search

**Response Measure:**
- 5 sec response, 12 average QPS
Homework: Scenario Refinement

• Generate scenarios based on raw notes
  – Lunch breaks, between days onsite

• Present to customer
  – Use the slide templates

• Guidelines and Hints
  – It's OK to use “Straw Man” response measures
  – Note all assumptions!
  – Beware of functional requirements disguised as quality attributes
WRAP-UP
1. Mini-QAW introduction (10 min)

2. Introduction to quality attributes, quality attributes taxonomy (15 min)

3. Scenario brainstorming (30 min – 2+ hours)
   • “Walk the System Properties Web” activity

4. Raw Scenario prioritization (5 – 10 min)
   • Dot voting

5. Scenario Refinement  (until time runs out)
   • While time remains, remainder is homework

6. Review results with stakeholders (1 hour, future meeting)
Creating your own Taxonomy

- Earlier QAW versions included a taxonomy and questionnaire!
  - “Quality Attributes Workshop Participants Handbook” by Barbacci et al. January 2000

- List of common software quality attributes and definitions

- Not architecture-related, great example of a taxonomy-based questionnaire
  - “Taxonomy-Based Risk Identification” by Carr, et al., June 1993
    http://www.sei.cmu.edu/reports/93tr006.pdf
Common Problems We’ve Seen

• Getting stakeholders in the room
• Some clients hate sticky notes…
• Knowledgeable facilitator is still needed
  – But training facilitators is easier
• Refining scenarios is as important as the workshop
  – Do not skip this step!
The Mini-QAW is NOT a replacement for the traditional QAW.
## Mini-QAW vs. Traditional QAW

<table>
<thead>
<tr>
<th>Mini-QAW</th>
<th>Traditional QAW</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Routine or well understood systems/problems</td>
<td>• Higher risk projects</td>
</tr>
<tr>
<td>• Required to minimize upfront costs</td>
<td>• System or problem is new to team</td>
</tr>
<tr>
<td>• Limited experience with traditional QAW</td>
<td>• Stakeholders prefers traditional methods</td>
</tr>
<tr>
<td>• Relatively short overall schedule</td>
<td>• Experienced facilitators available</td>
</tr>
</tbody>
</table>
Silver Toolbox
Creating taxonomies and questionnaires is really hard.

Let’s work together to make our profession more awesome…
Thank you!

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References


