



AARHUS UNIVERSITET

# Software Architecture in Practice

Quality Attribute Workshops

*Finding the QAS*

- I expect you to have read the SEI report on QAW
  - I will give a five minute run-down of it...
- Steps 1..3 should be known by now
  - Through the Mandatory 1 work
- Group exercise on step 4..8
  - Input to your Mandatory 2
  - **Team up until you have at least 7-8 people**
  - **Choose a facilitator**

The QAW involves the following steps:

1. QAW Presentation and Introductions
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

(4)

## 1. Identification of Architectural Drivers

- = most critical software architecture quality requirements

(5)

## 2. Scenario Brainstorming

- Find quality attribute scenarios in a brainstorming process

(7)

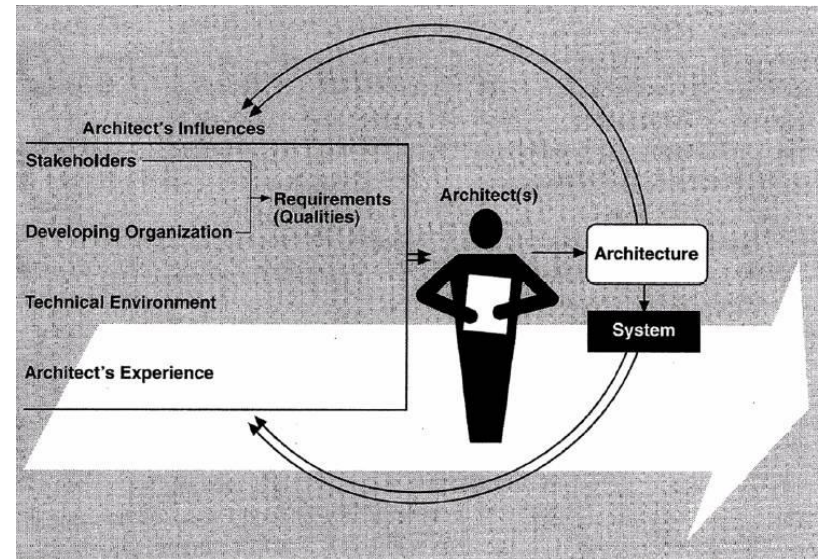
## 3. Scenario Prioritization

- Vote on scenarios

(8)

## 4. Scenario Refinement

- Refine most important scenarios to be on the quality attribute scenario format of [Bass et al, 2021]






# 1. Architectural Drivers/WoW

Examples

- Performance
  - Players shall have a responsive and smooth gaming experience
- Availability
  - Players shall be able to play always
- Modifiability
  - Game designers shall be able to introduce new items (weapons etc.) and quests while the game world is executing
- Security
  - Players shall not play without paying their subscription fees
  - Player A may never fiddle with gear of Player B
- .....

# 2. Scenario Brainstorm

- Goal
  - Come up with as many well-formed quality attribute scenarios as possible
  - **Stimulus, environment, response**
- Participants
  - Come up with quality attribute scenarios
  - **No critique** as such, only clarification questions
- **Facilitator** ← 
  - Write scenarios on whiteboard/paper/**post-it**
  - Ensure that scenarios are **usable**
    - “The system shall be modifiable” vs. “The user interface of ... is changed to different look & fell in two person days”
  - Make sure architectural drivers are **covered**
- Either fixed time period or whenever participants run out of good ideas
  - Usually easy to create 20+ scenarios



Response  
measure



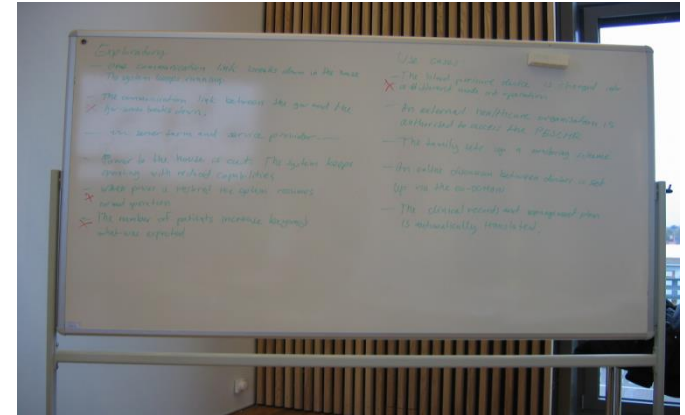


# 2<sup>1</sup>/<sub>2</sub> Consolidation

- Do not spend too much time on it, but
- If you find 2+ QaS **that are obviously almost the same, then merge them into one!**
- Otherwise the prioritization next will be wrong...

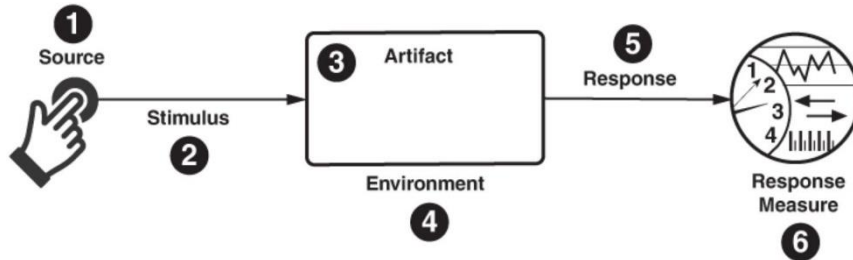
# 3. Scenario Prioritization

- Each stakeholder has (30% of #scenarios) votes
  - Standard brainstorming stuff
- Round-robin voting
  - Two passes
  - Each pass: allocate half of votes
- Resulting count = prioritization
  - High
  - Medium
  - Low priority



# 4. Scenario Refinement

- Develop high priority scenarios according to scheme of [Bass et al., 2021]
  - Describe relevant quality attributes
  - Find questions and issues



## WoW– Quality Attribute Scenario 1

*Scenario(s):* A realm server fails, gameplay is continued in two seconds

*Relevant Quality Attributes:* Availability

*Stimulus Source:* Internal to system

*Stimulus:* Fails

*Environment:* Normal operation

*Artefact (If Known):* Realm server

*Response:* Failure detected, recorded, continue to operate

*Response Measure:* No downtime  
React in two seconds





# Stakeholder grouping / Mand.#2

- Split your workshop participants into *roles*
  - **Owners** of TeleMed company
    - Want to earn money, establish customer base, extend across globe
  - **Patients** / Users of TeleMed (probably elderly people!)
    - Want the damn thing to work
  - **Tests** and QA people
    - Deliver high quality and well tested products
  - Software **developers**
    - Want easy and understandable code (and use cool tech.!)
  - **Regional Hospitals**
    - Want maintainable, easy deployment, safe/secure operations