Abstract

Many decisions are taken during the architecting of a system. The question is what are architectural decisions? And what is the process behind making these decisions? The expectations of the stakeholders will be discussed. The actual way of working of architects will be described.
Architectural Decision Making; What Happens Behind the Scenes?

Architectural Decision Making; What Happens Behind the Scenes?

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Figure Of Contents™
Buzzword, Hype, Solution or What?

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What is Architecture?

Mark all applicable boxes

- specifications
- components (implementations)
- high level rules
- concepts
- standards
- indicators
- overarching vision
- guidance monitoring
- domain codification
- other...

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HMPAwhatIsArchitecture
Architecture vs Description

Architecture

Subset of which architect is aware

Flattened into

Architecture description

Actually written by architect(s)
My View on Architecture

Understanding  
Why

Describing  
What

Guiding  
How

*Do the right things*

*Do the things right*
"Guiding How" by providing rules for:

1. Functional Decomposition
2. Construction Decomposition
3. Allocation
4. Infrastructure
5. Choice of integrating concepts
The Art of Architecting

Stakeholders

Expectations

Architecting

analyze
assess
balance
trade-off
decide

vision
overview
insight
understanding

Architecture

Architect(s)

Intuition

Note:
Facts, Expectations and Intuition might be false

Architecture(s)

Facts

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Another Buzzword or Solution?

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ADMpresentationIconDecision
How many (architectural) decisions does an architect make?
Decision Making Process

1. Problem understanding
2. Analysis
3. Decision
4. Monitor, verify, validate

vague problem statement
conflicting other decision
insufficient data
no satisfying solution
invalidated solution
Decision Making Process *Annotated*

1. **Problem understanding** by exploration and simple models

2. **Analysis** by
   - exploring multiple propositions (specification + design proposals)
   - exploring decision criteria (by evaluation of proposition feedback)
   - assessment of propositions against criteria

3. **Decision** by
   - review and agree on analysis
   - communicate and document

4. **Monitor, verify, validate** by
   - measurements and testing
   - assessment of other decisions

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Graph of Decisions and Alternatives

legend

- past decision
- most probable decision
- potential alternative
- less probable alternative

scope of architect's considerations

communication

scope

past decision

most probable decision

potential alternative

less probable alternative

now

time

scope of architect's considerations
Different Types of Decisions

Understanding Why
Describing What
Guiding How

- basic principles
- requirements
- architecture rules, implementation choices (e.g., technology)
Many Decisions are taken in the Dark

Highest impact decisions are taken while the least factual knowledge is available
Why Project Leaders Sometimes don’t like Architects

Architecting
- analyze
- assess
- balance
- trade-off
- decide

Decision - Action

Facts, Expectations and Intuition might be false

Highest impact decisions are taken while the least factual knowledge is available

Decision - Action

Chicken or Egg?
Bottom-line is a Working System

architecture

decision

architect

system
Decisions Are Related

Customer objectives

why?

how?

Application

why?

what?

how?

Functional

why?

what?

how?

Conceptual

why?

what?

how?

Realization

why?

how?
Worse, Decisions Are Heavily Related

[Diagram showing relationships between Customer objectives, Application, Functional, Conceptual, and Realization]
Architecting is much more than Decomposition

Decomposition is "easy"
Integration is difficult
In Documentation Terms

δ's or structured

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system

qualities

e.g. performance

subsystem

subsystem

subsystem
Revisiting Architecture

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architecture -> decision

architect

system
Is architecture = \sum_{{all \ \text{decision}}} = \text{preconceived} = \text{emerging from} \ \text{environment} = \text{system} = \text{creation} = \text{context}

Fundamental Question
Back-up Slides and Answers only after this Slide
### Quantification from “The Role and Task of the System Architect”

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<th>Architect time per item</th>
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Quantification from “Architectural Thinking”

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ATmentalDynamicRange

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