

Architectural Decision Making; What Happens Behind the Scenes?

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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.

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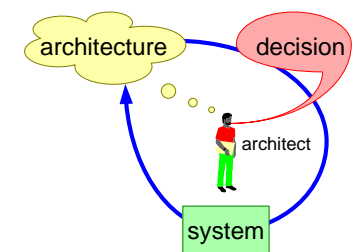
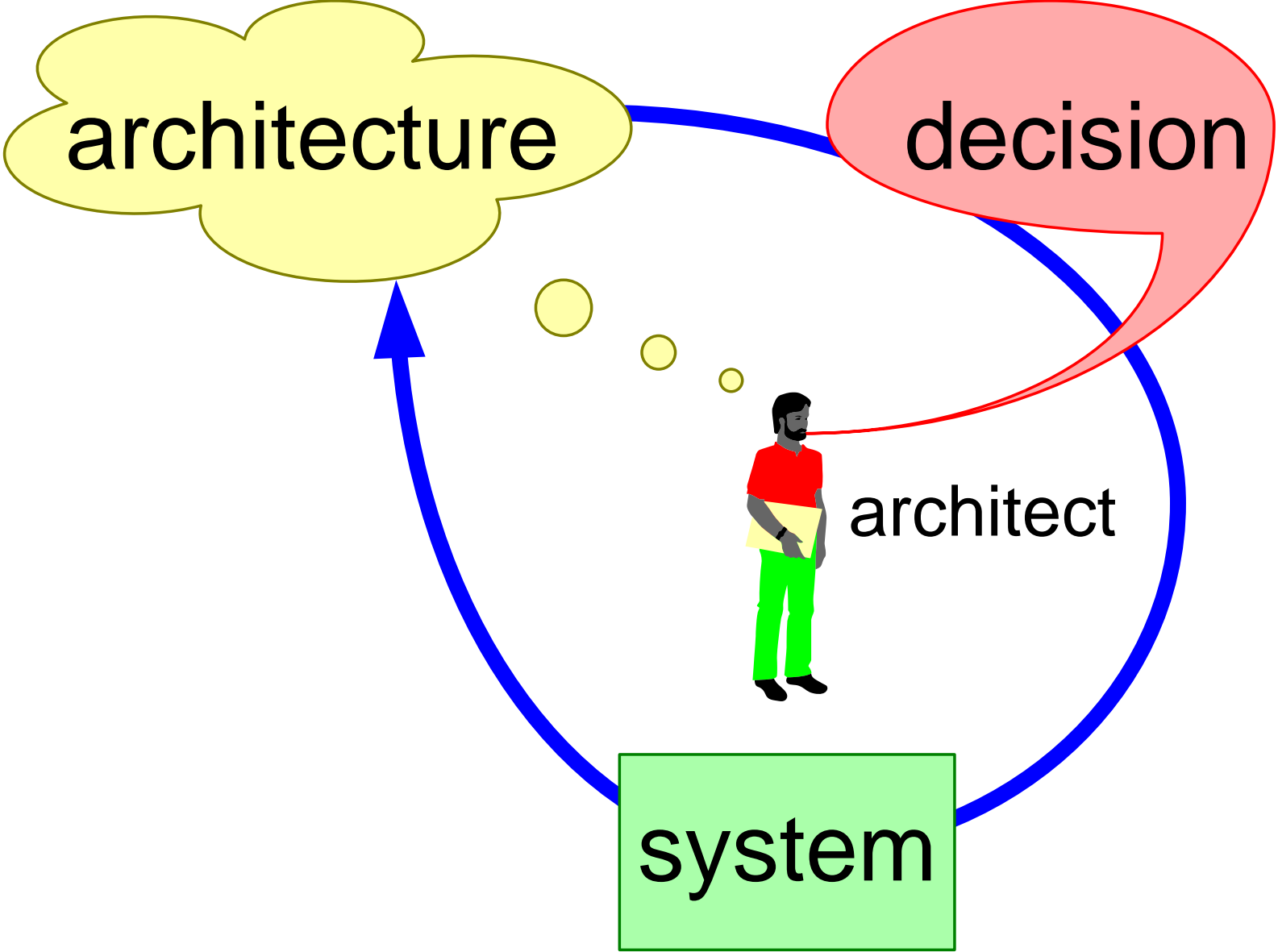
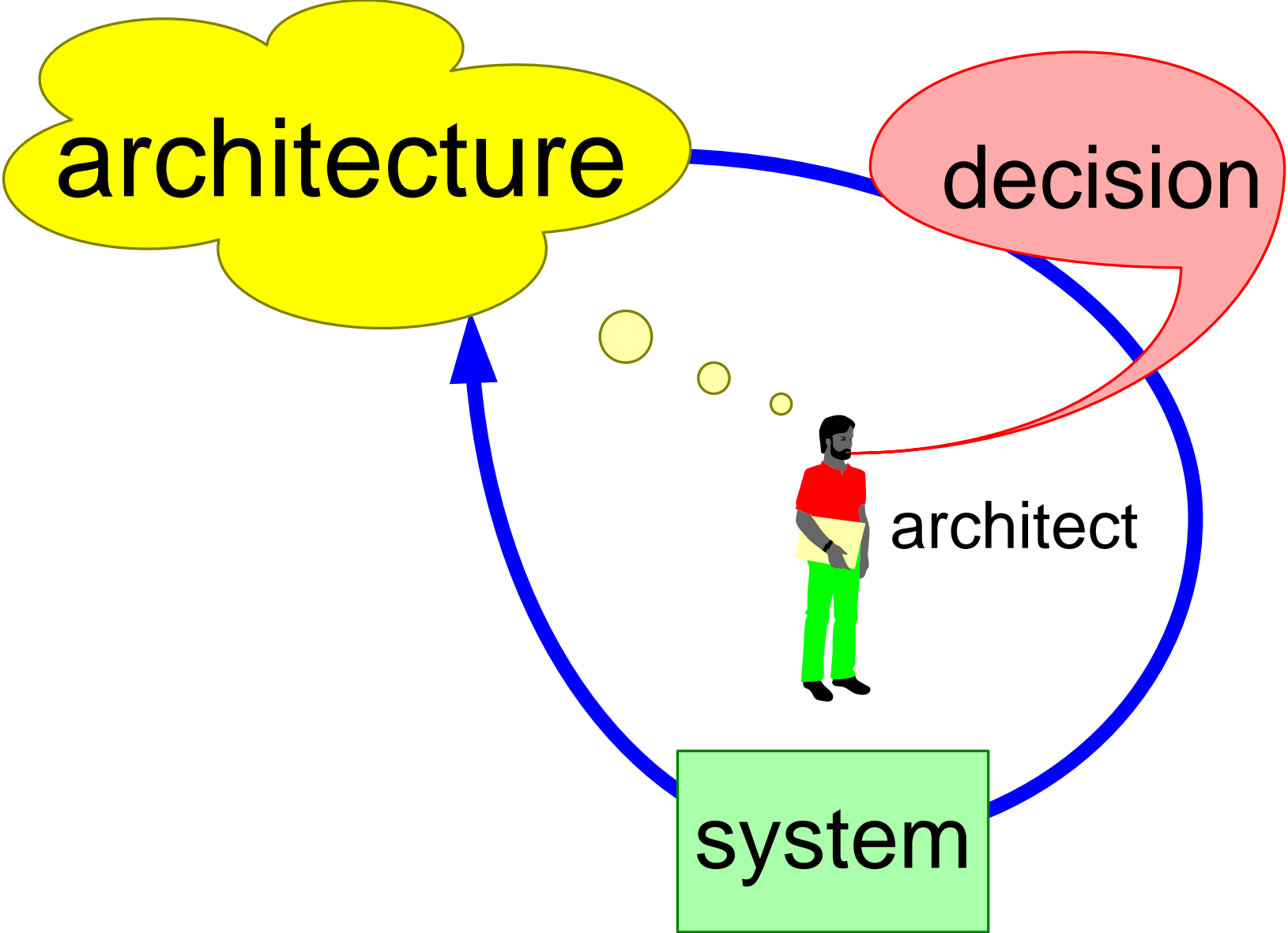


Figure Of Contents™

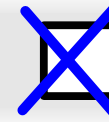


Buzzword, Hype, Solution or What?



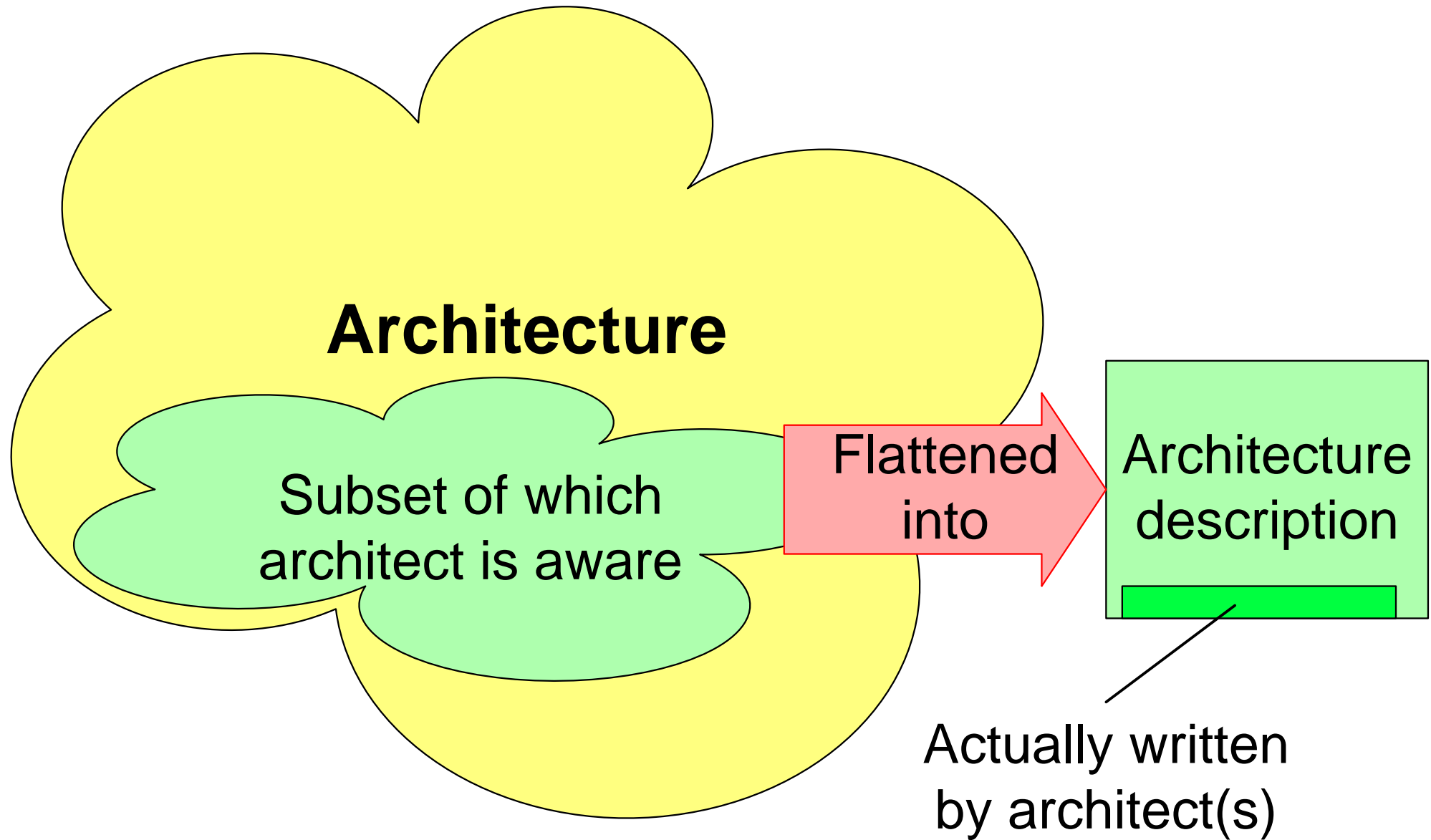
What is Architecture?

Mark all applicable boxes



<input type="checkbox"/> <p>specifications</p>	<input type="checkbox"/> <p>indicators</p>	<input type="checkbox"/> <p>overarching vision market, business, technology process, product</p>
<input type="checkbox"/> <p>API's</p>	<input type="checkbox"/> <p>high level rules</p> <p>layer n !calls n-k; k>1 layer n !calls n+k; k>0</p>	<input type="checkbox"/> <p>guidance monitoring</p>
<input type="checkbox"/> <p>components (implementations)</p>	<input type="checkbox"/> <p>concepts</p> <p>audio pipeline message routing whit communication</p>	<input type="checkbox"/> <p>domain codification</p> <p>Java SQL FPGA technology</p>
<input type="checkbox"/> <p>infrastructure</p> <p>OS file system bus memory I/O</p>	<input type="checkbox"/> <p>standards</p> <p>http DVB IPTV WMA MP3 JPEG</p>	<input type="checkbox"/> <p>other...</p>

Architecture vs Description



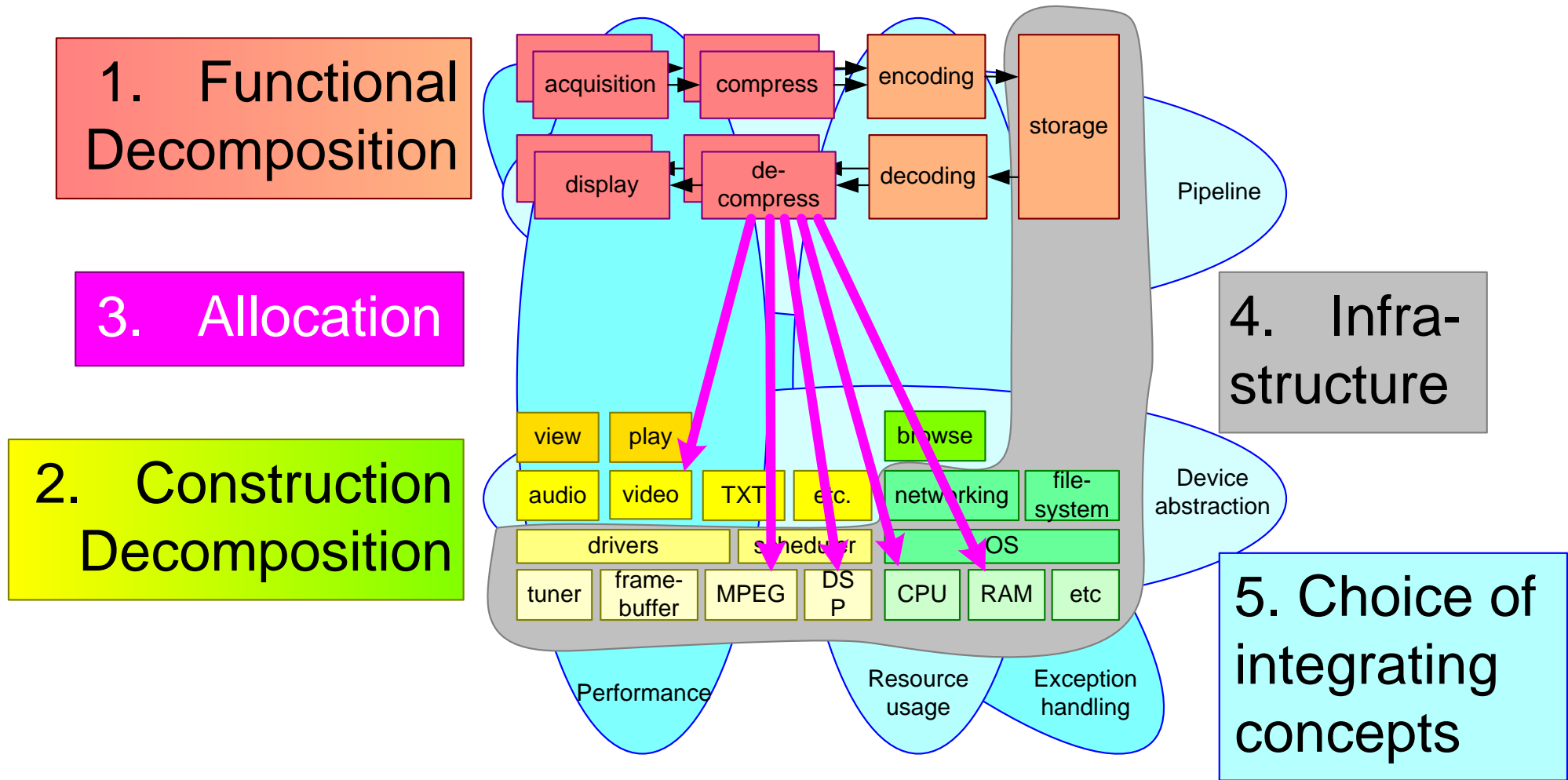
My View on Architecture



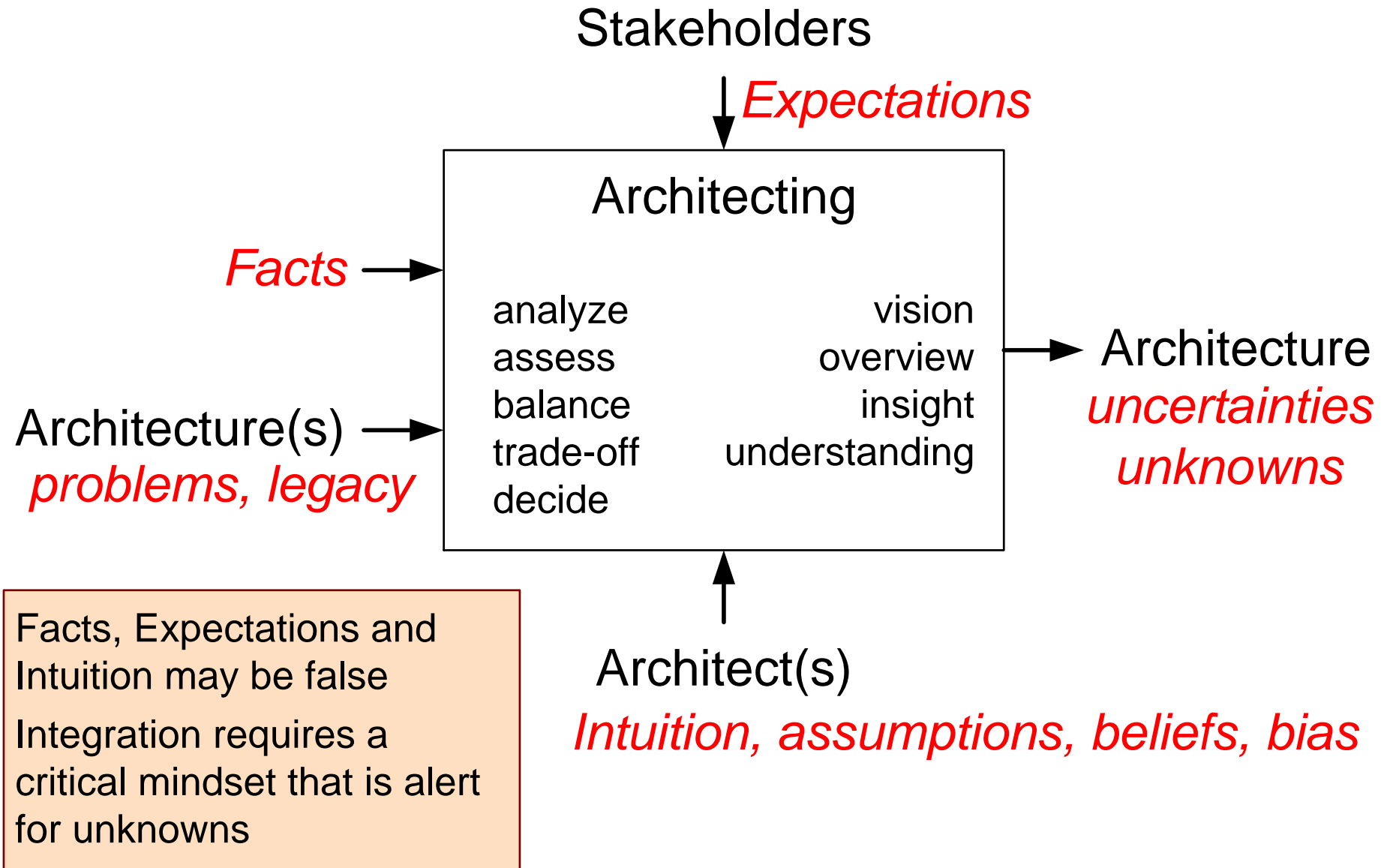
Do the right things

Do the things right

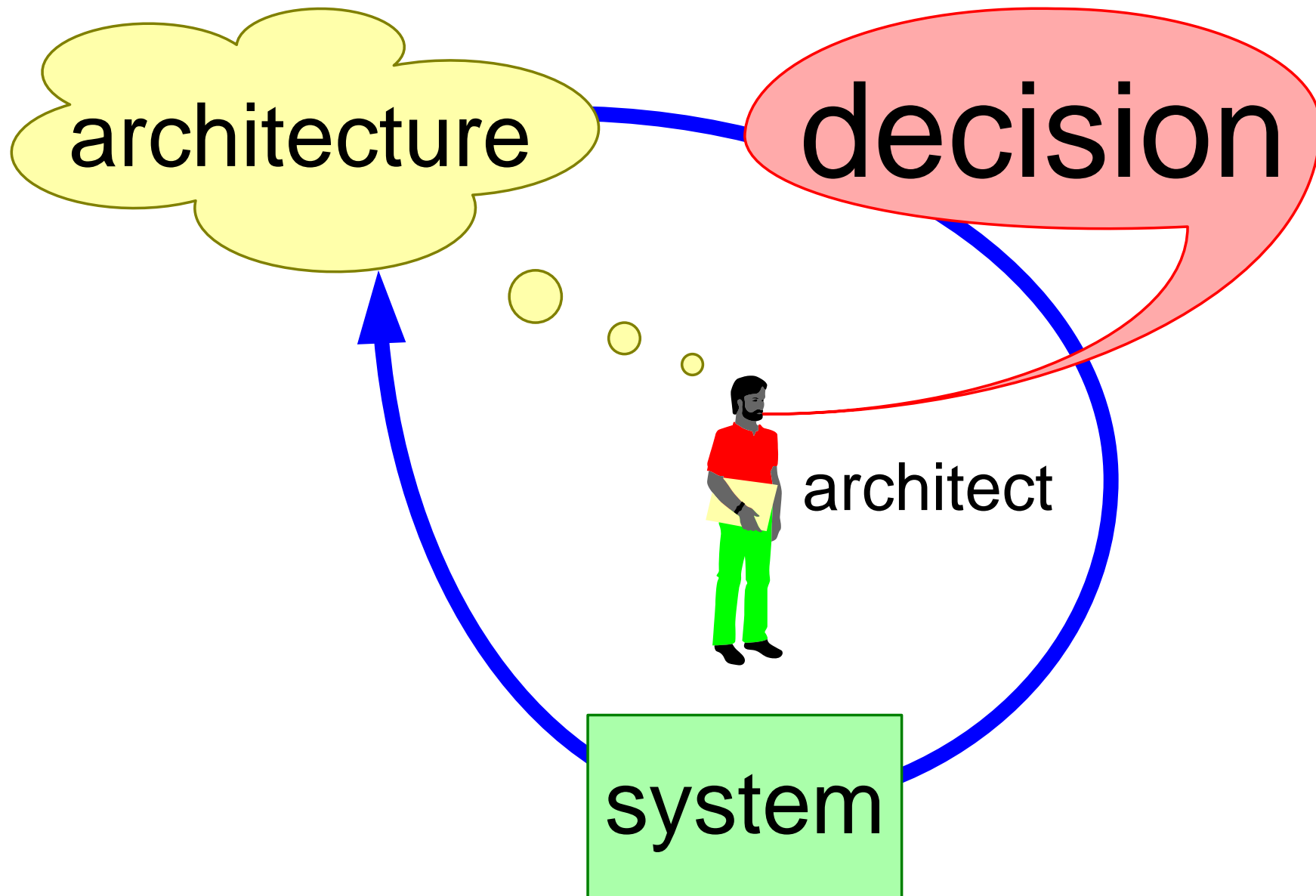
"Guiding How" by providing rules for:



The Art of Architecting

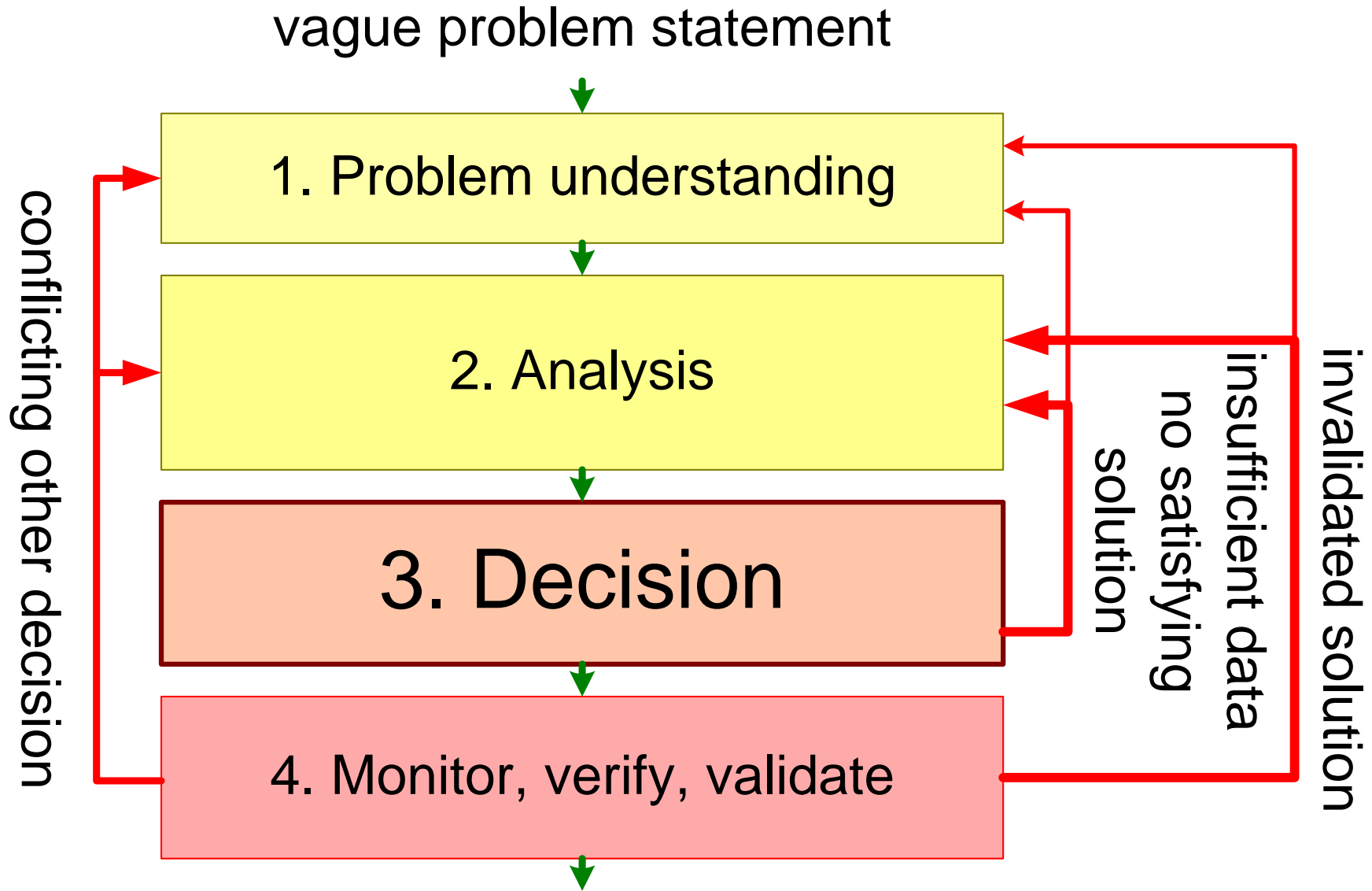


Another Buzzword or Solution?



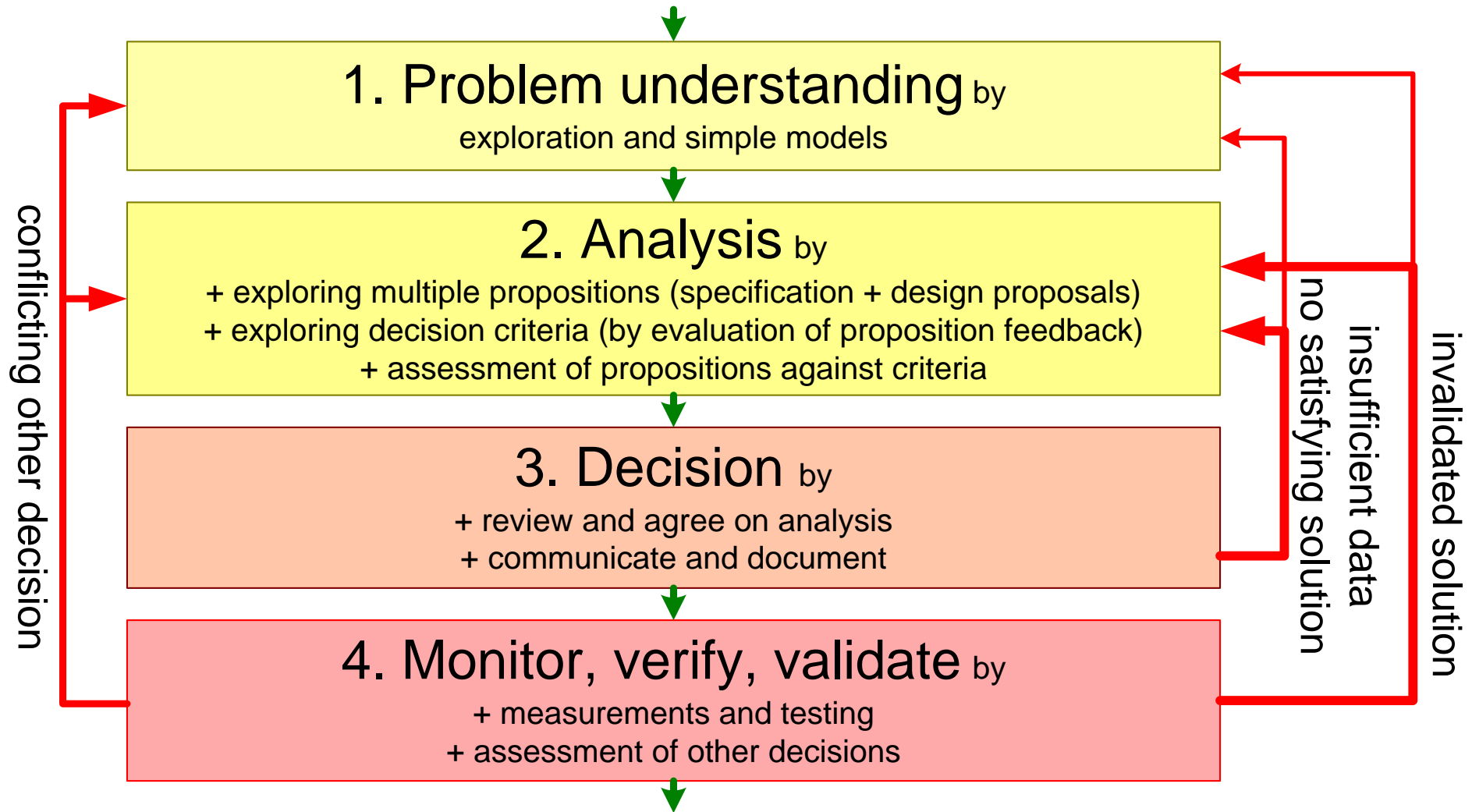
How many (architectural) decisions does an architect make?

Decision Making Process



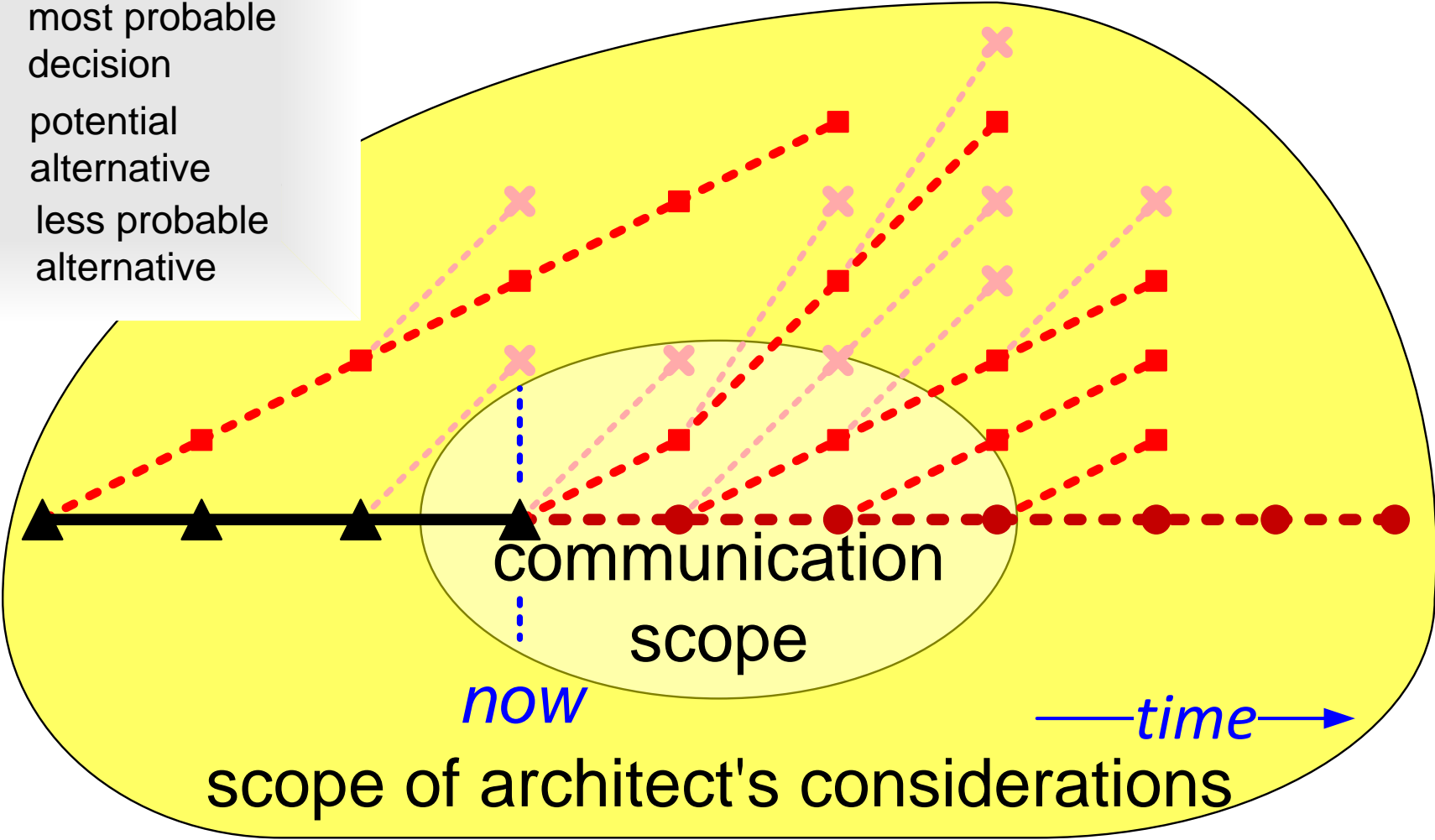
Decision Making Process *Annotated*

vague problem statement



Graph of Decisions and Alternatives

- legend*
- ▲ past decision
 - most probable decision
 - potential alternative
 - ✕ less probable alternative



Different Types of Decisions

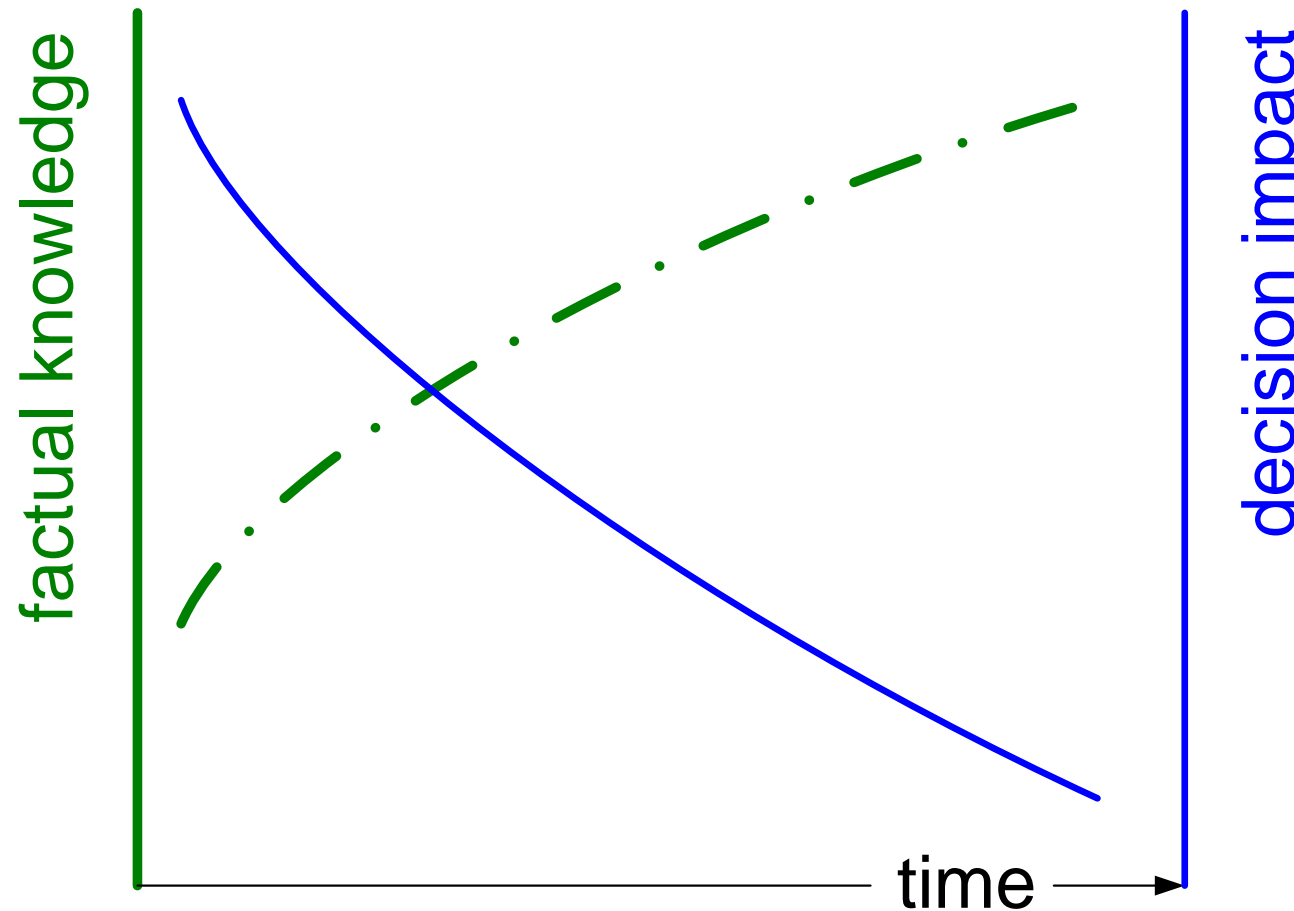


basic
principles

requirements

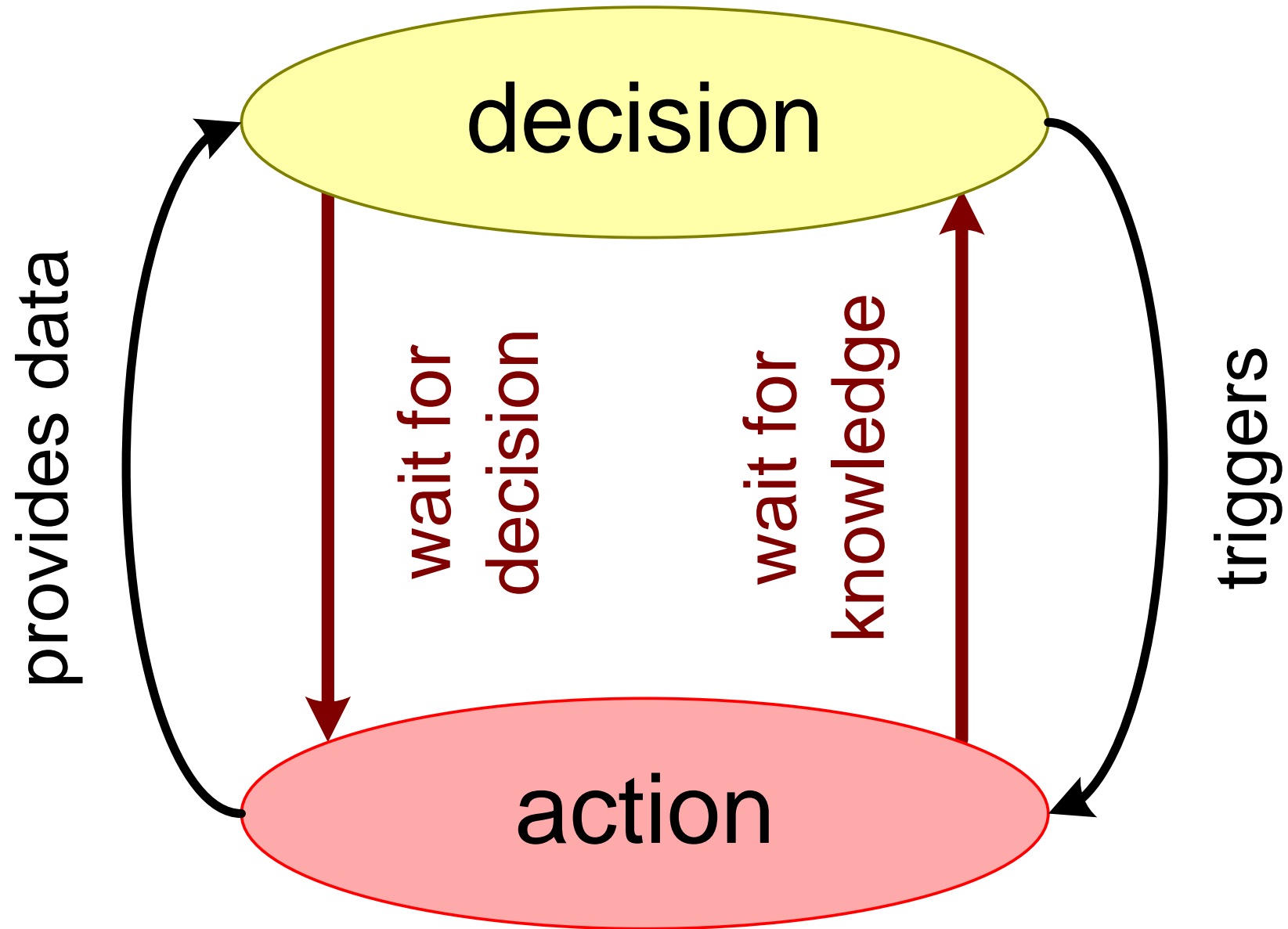
architecture rules
implementation choices
f.i. technology

Many Decisions are taken in the Dark

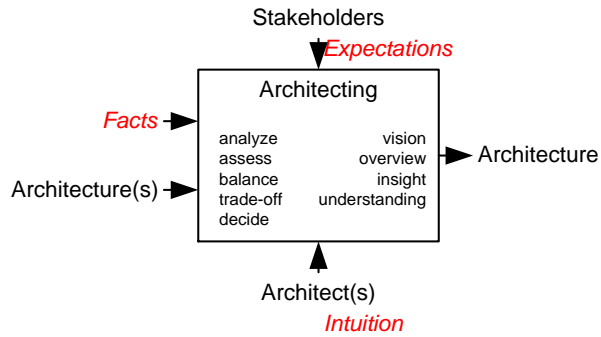


Highest impact decisions are taken while the least factual knowledge is available

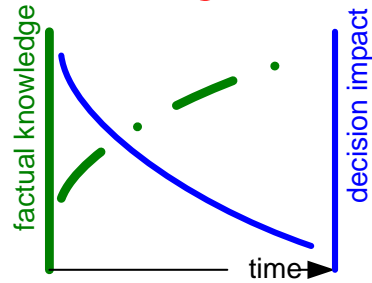
Chicken or Egg?



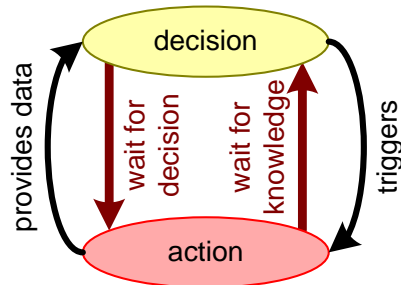
Why Project Leaders Sometimes don't like Architects



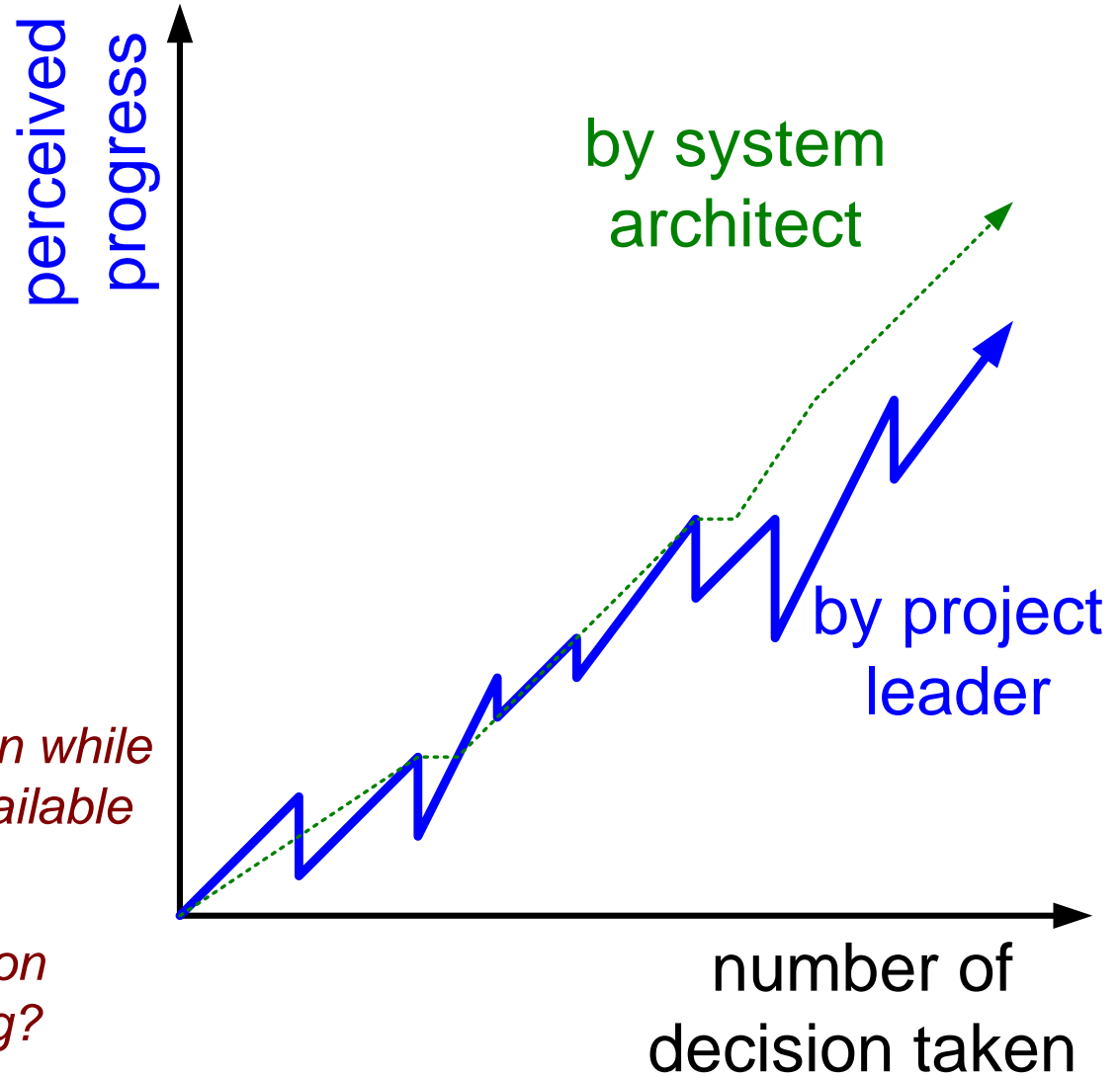
Facts, Expectations and Intuition might be false



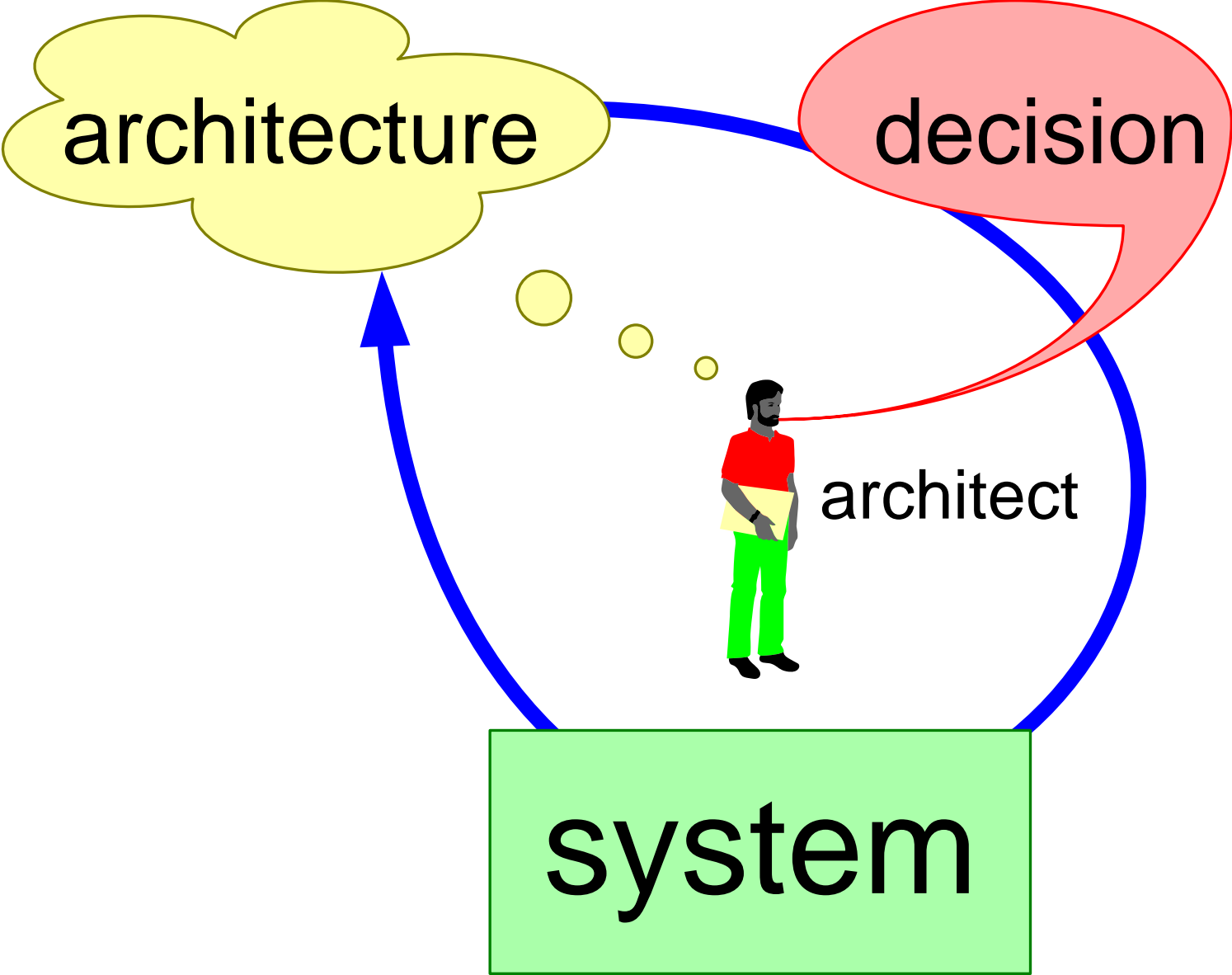
Highest impact decisions are taken while the least factual knowledge is available



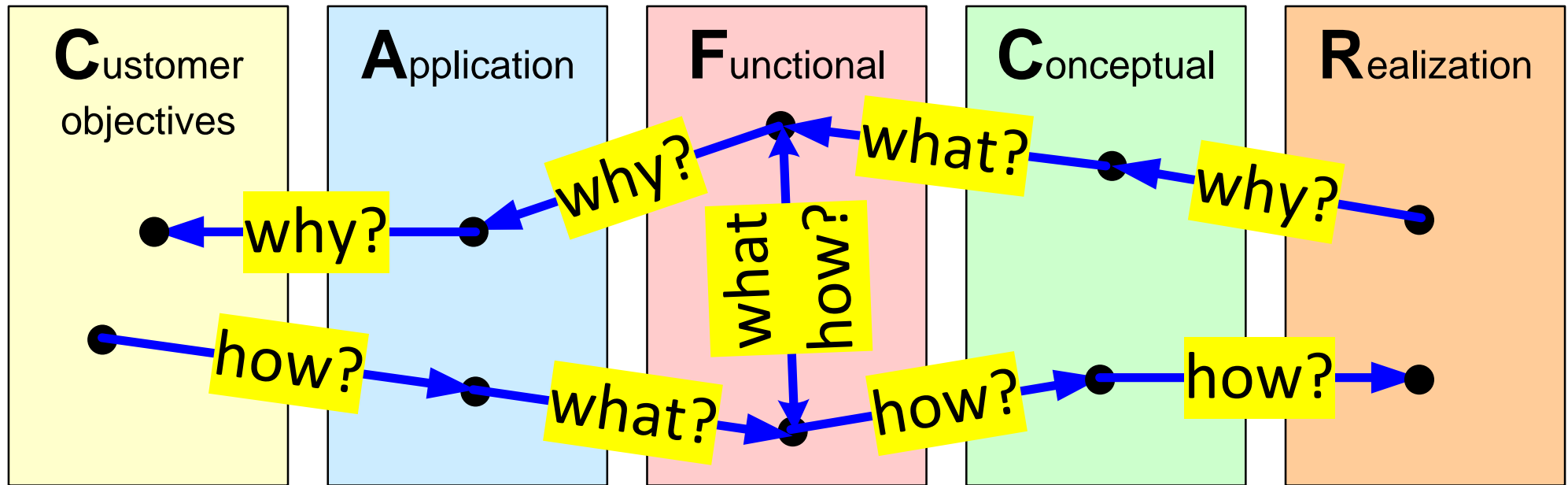
decision - action chicken or egg?



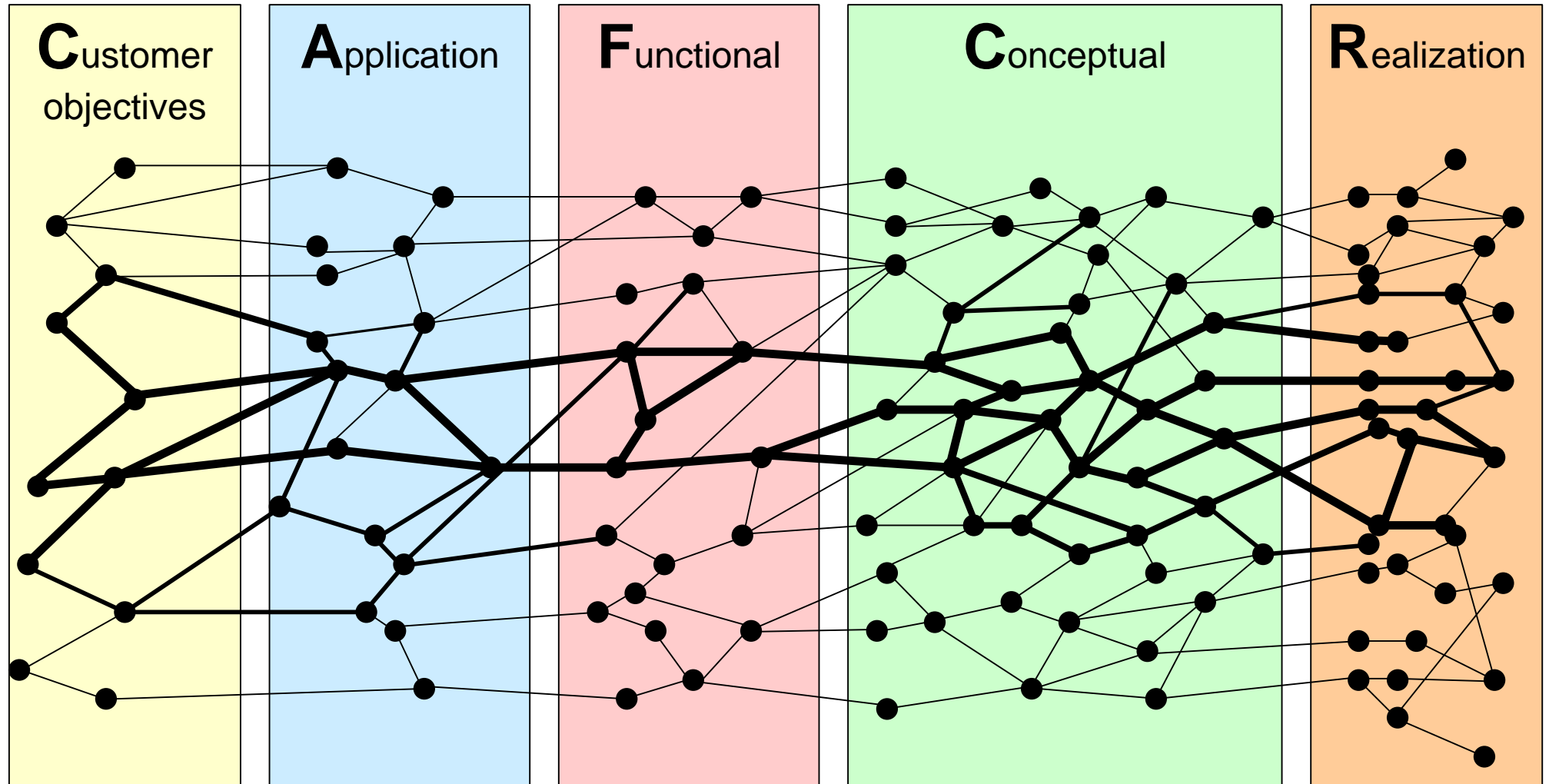
Bottom-line is a Working System



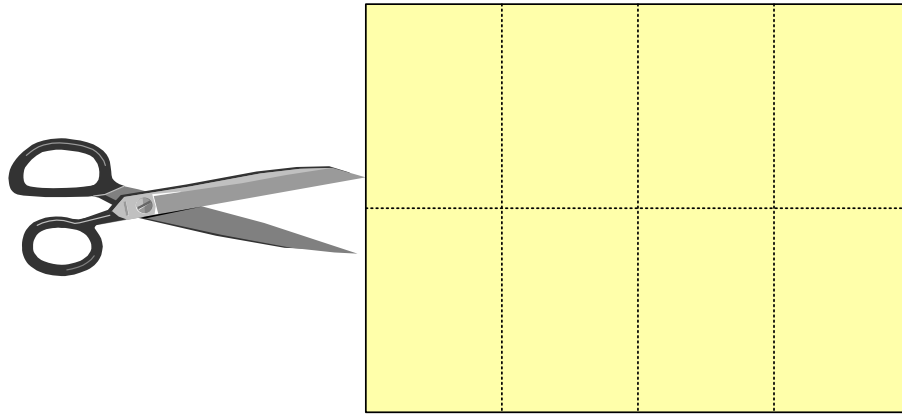
Decisions Are Related



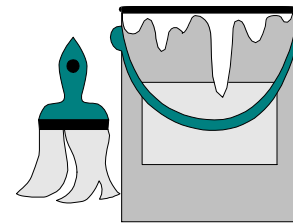
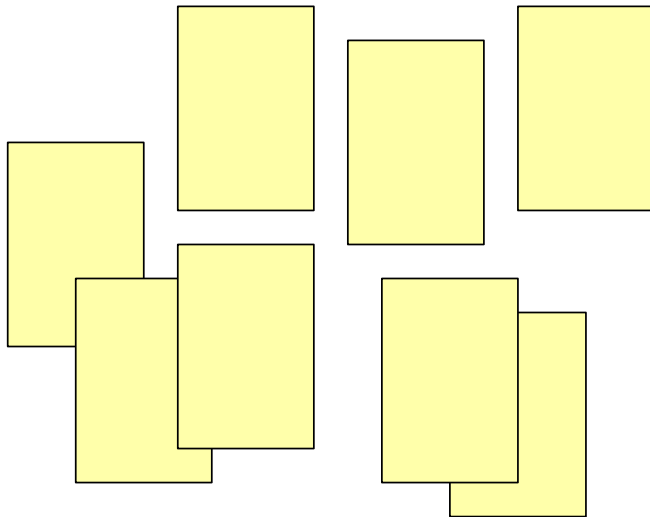
Worse, Decisions Are Heavily Related



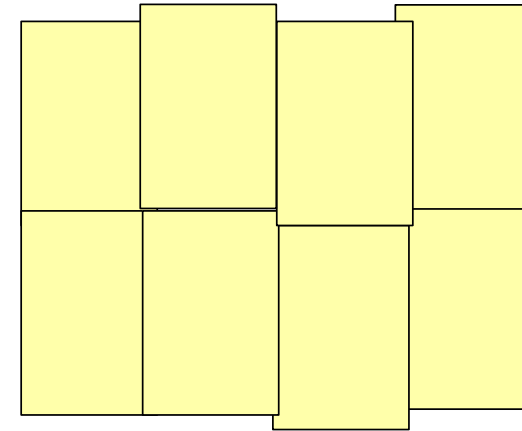
Architecting is much more than Decomposition



Decomposition
is "easy" ↓



→
Integration is
difficult

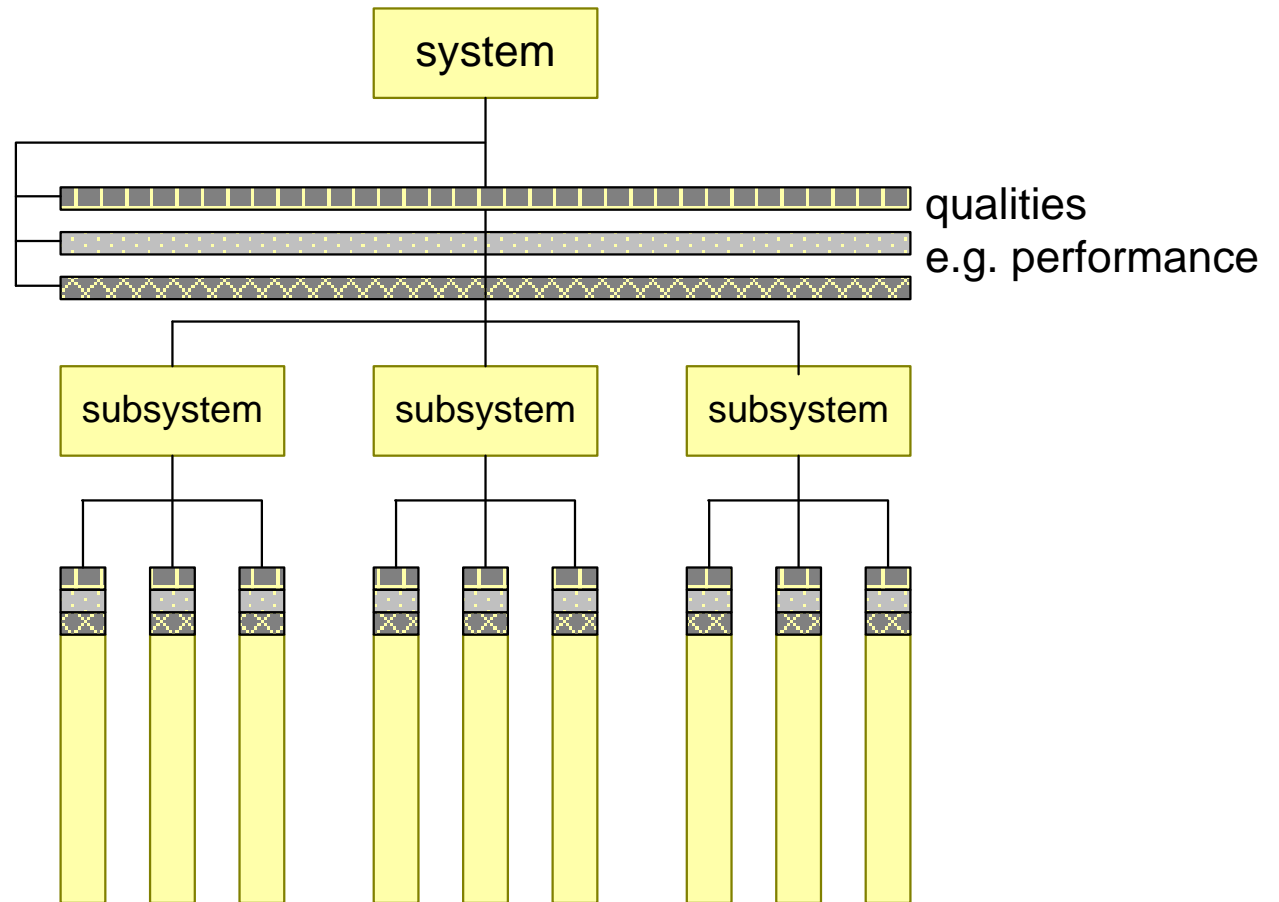


δ's or structured

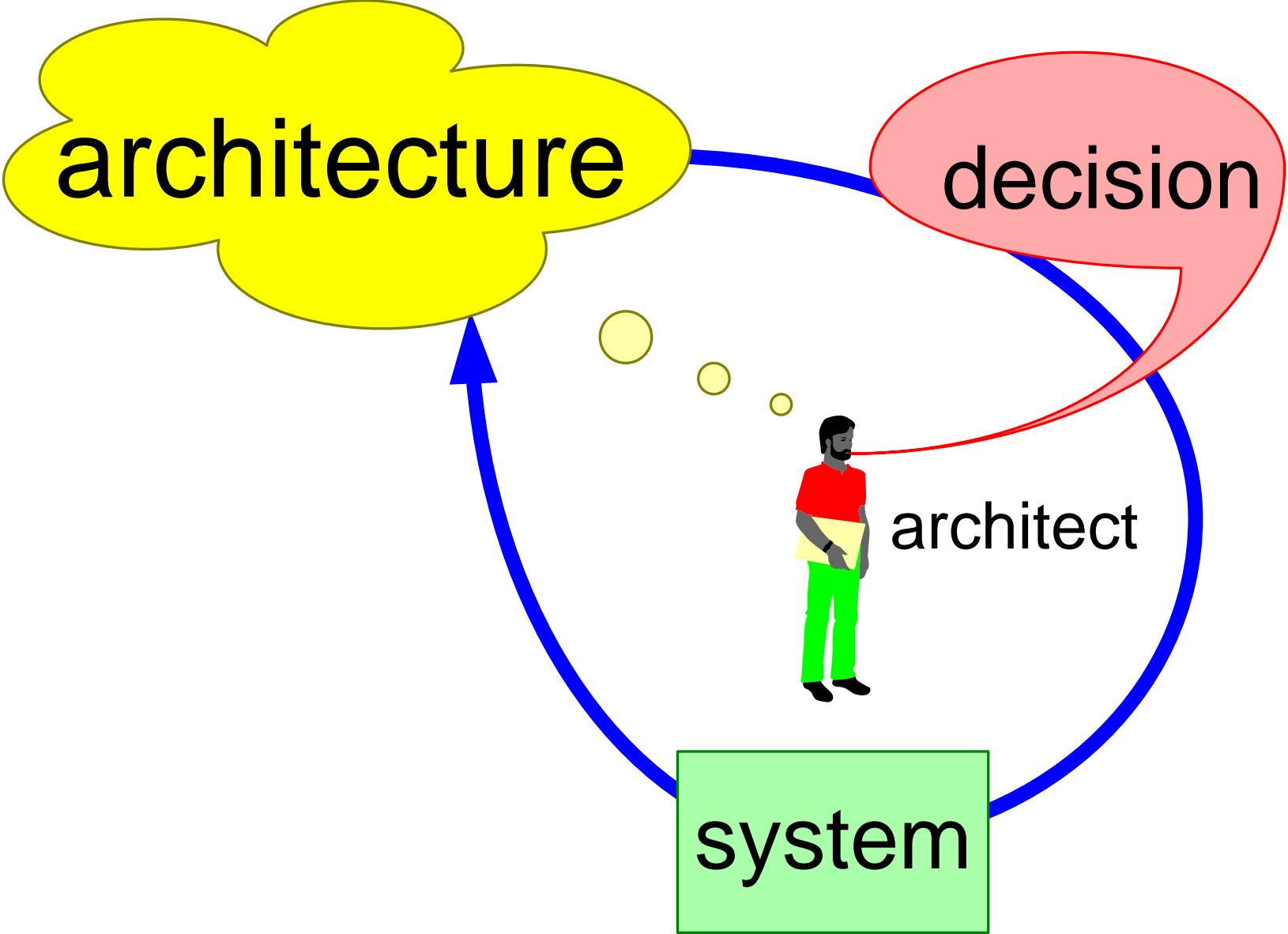
minutes 1
decision 1
decision 2
decision 3

minutes 2
decision 4
decision 5
decision 6

minutes k
decision n
decision n+1
decision n+2

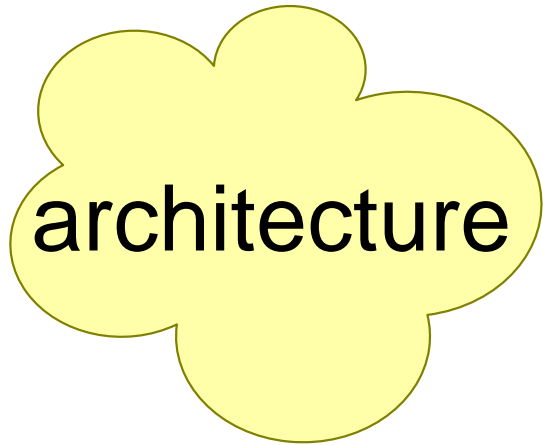


Revisiting Architecture



Fundamental Question

Is **architecture**



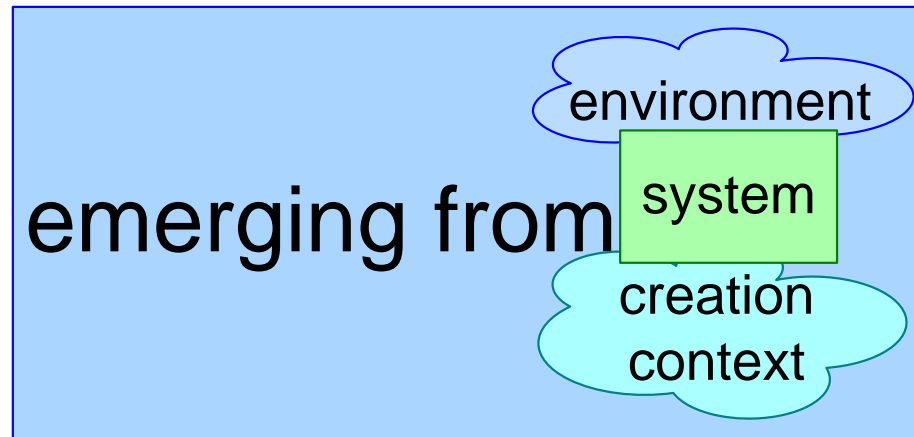
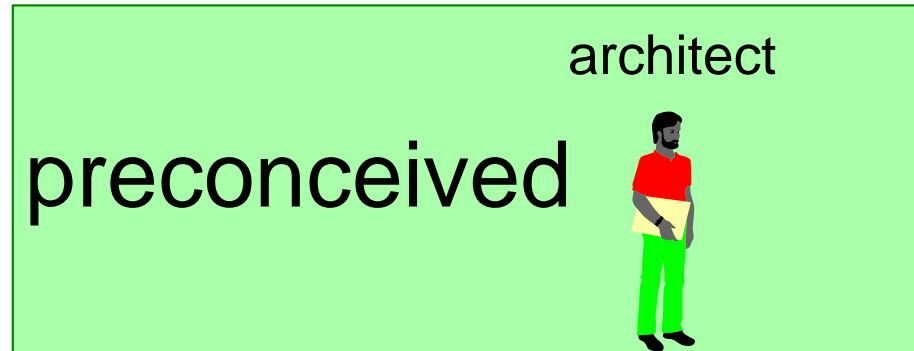
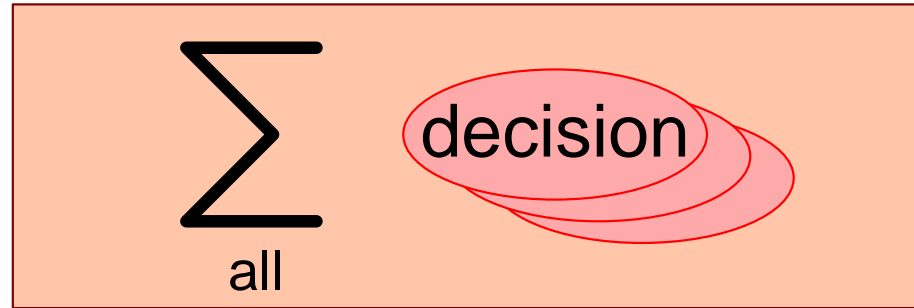
=

or

=

or

=



The End

Back-up Slides and Answers only after this Slide

Quantification from “The Role and Task of the System Architect”

		Quantity per year (order-of- magnitude)	architect time per item
consolidation in deliverables meetings informal contacts sampling scanning	→ driving views	10	100 h
	→ shared issues	10^2	1 h
	→ touched details	10^4	0.5 – 10 min
	→ seen details	$10^5 – 10^6$	0.1 – 1 sec
	→ product details	$10^7 – 10^{10}$	
	real-world facts	infinite	

Quantification from “Architectural Thinking”

