

# Role and Task of the System Architect

by *Gerrit Muller* Embedded Systems Institute

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`www.gaudisite.nl`

## Abstract

The role and the task of the system architect are described in this module.

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version: 1.0



Embedded Systems  
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# The Role and Task of the System Architect

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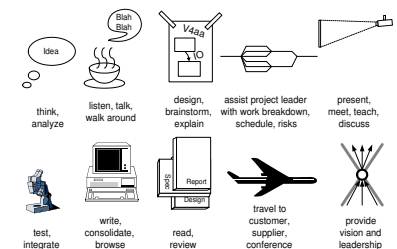
## Abstract

The role of the system architect is described from three viewpoints: deliverables, responsibilities and activities. This description shows the inherent tension in this role: a small set of hard deliverables, covering a fuzzy set of responsibilities, hiding an enormous amount of barely visible day-to-day work.

## Distribution

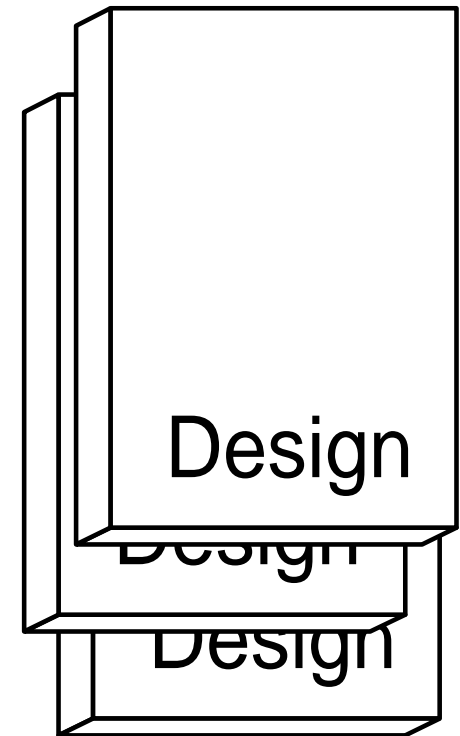
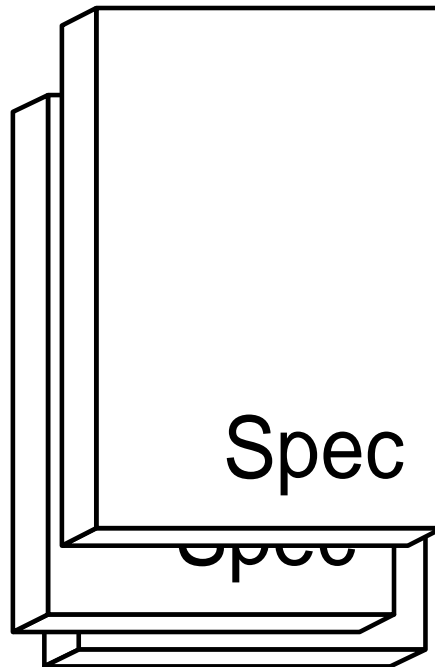
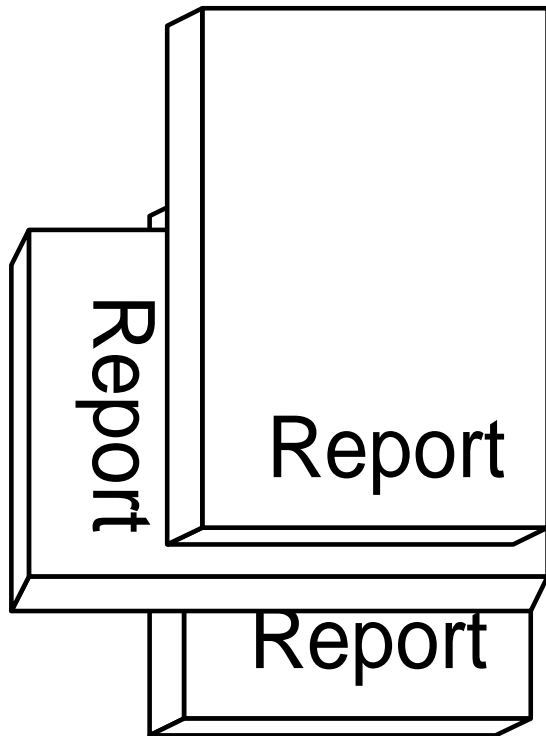
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# Deliverables of the System Architect

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# List of Deliverables

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Customer and Life-Cycle Needs *(what is needed)*

System Specification *(what will be realized)*

Design Specification *(how the system will be realized)*

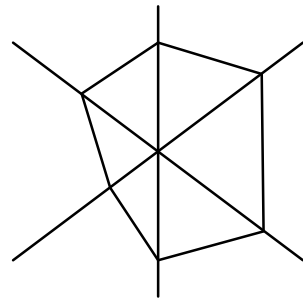
Verification Specification *(how the system will be verified)*

Verification Report *(the result of the verification)*

Feasibility Report *(the results of a feasibility study)*

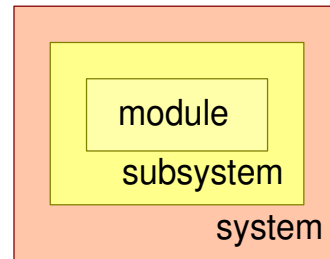
Roadmap

# Responsibilities of the System Architect



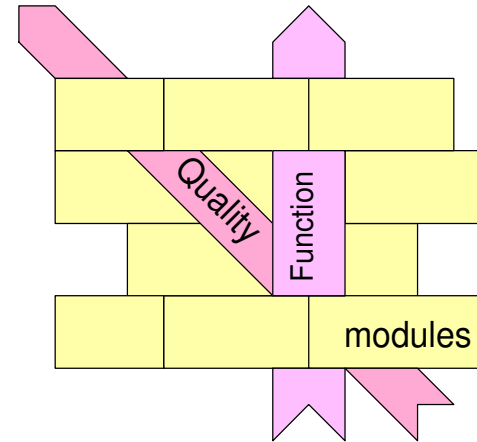
Balance

Requirement  
Spec  
Design  
Realization



Consistency

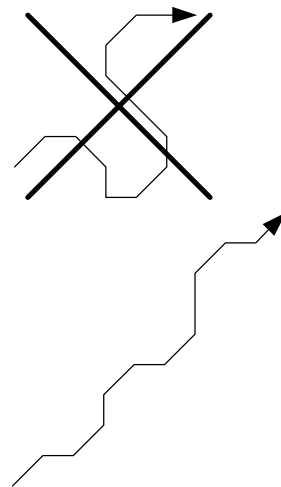
Decomposition  
Integration



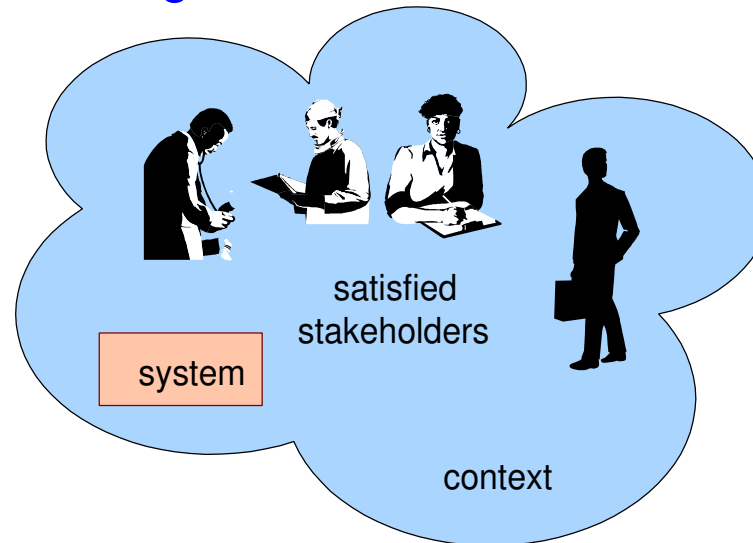
Overview

KISS

Elegance  
Simple



Integrity



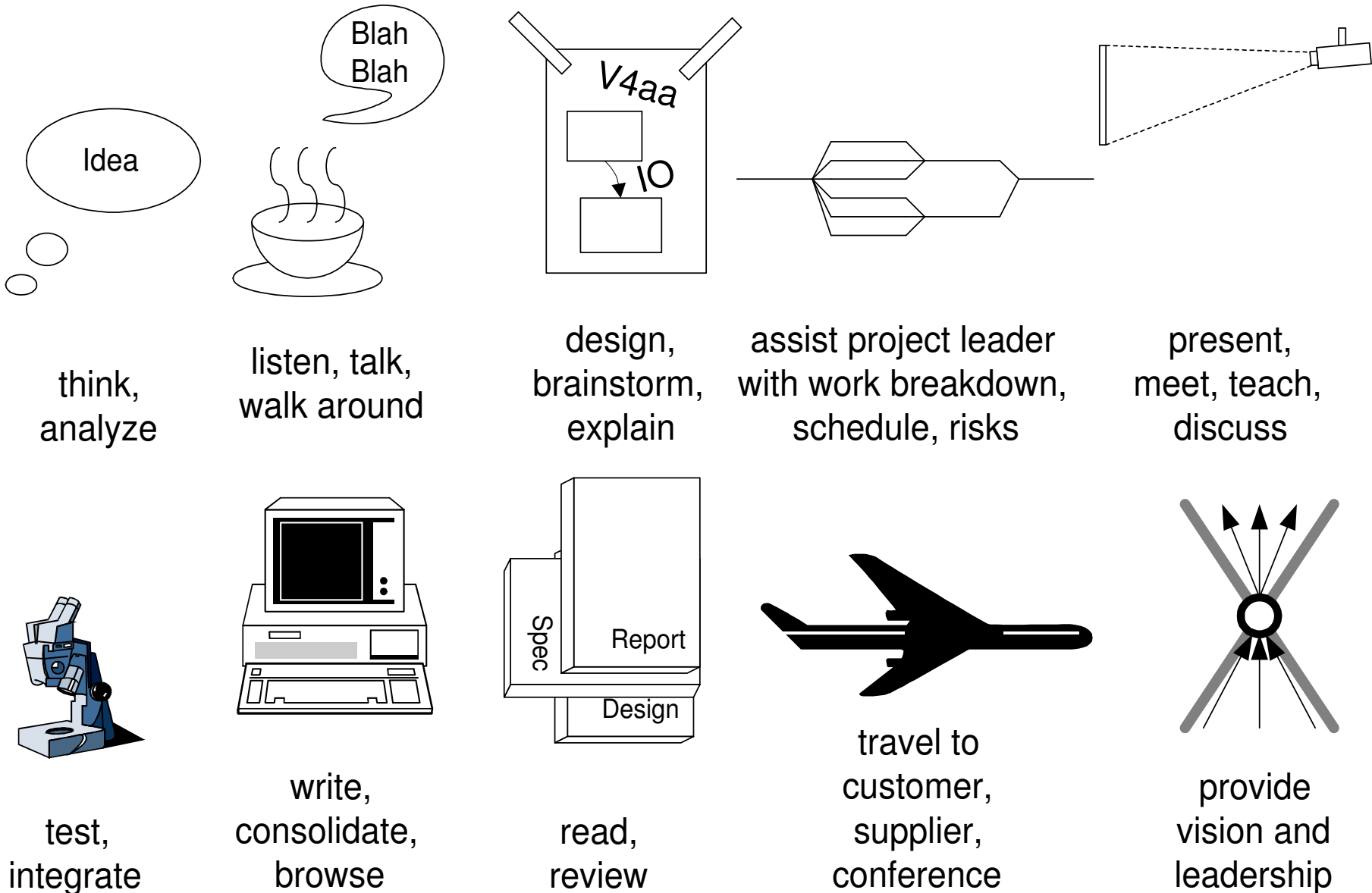
Fitting

# Examples of Secondary Responsibilities

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responsibility	primary owner
business plan, profit	business manager
schedule, resources	project leader
market, salability	marketing manager
technology	technology manager
process, people	line manager
detailed designs	engineers

# What does the System Architect do?

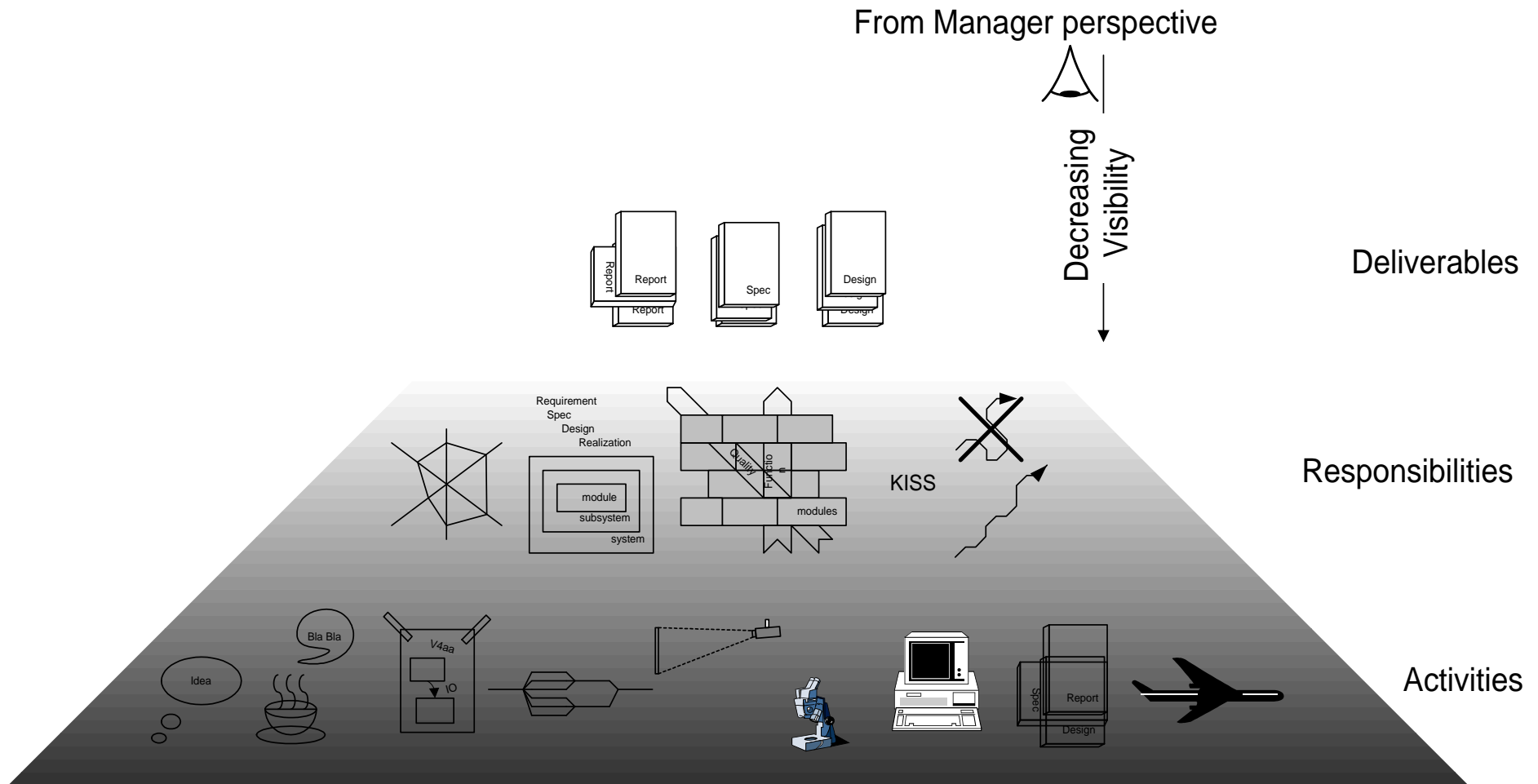


# From Detail to Overview

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

Abstractions only exist for concrete facts.

# Visible Output versus Invisible Work



# The Awakening of a System Architect

by *Gerrit Muller* Buskerud University College

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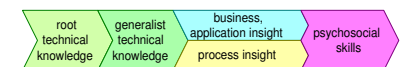
## Abstract

The typical phases of a system architect development are described, beginning at the fundamental technology knowledge, with a later broadening in technology and in business aspects. Finally the subtlety of individual human beings is taken into account.

## Distribution

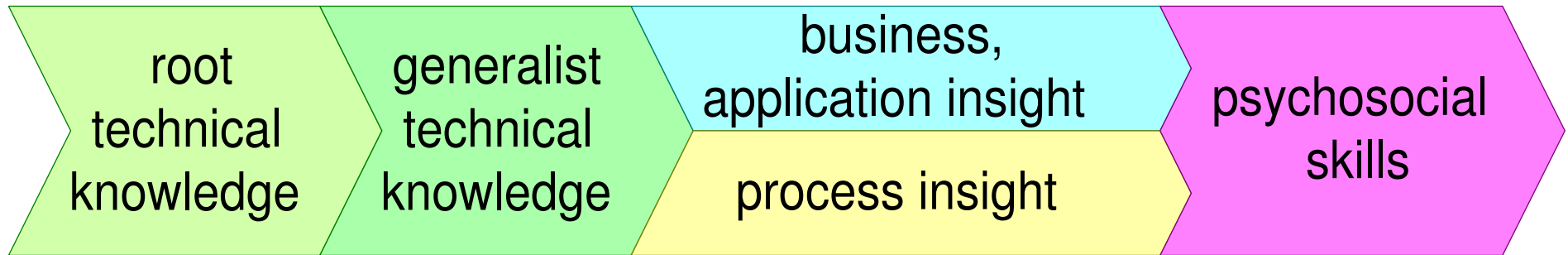
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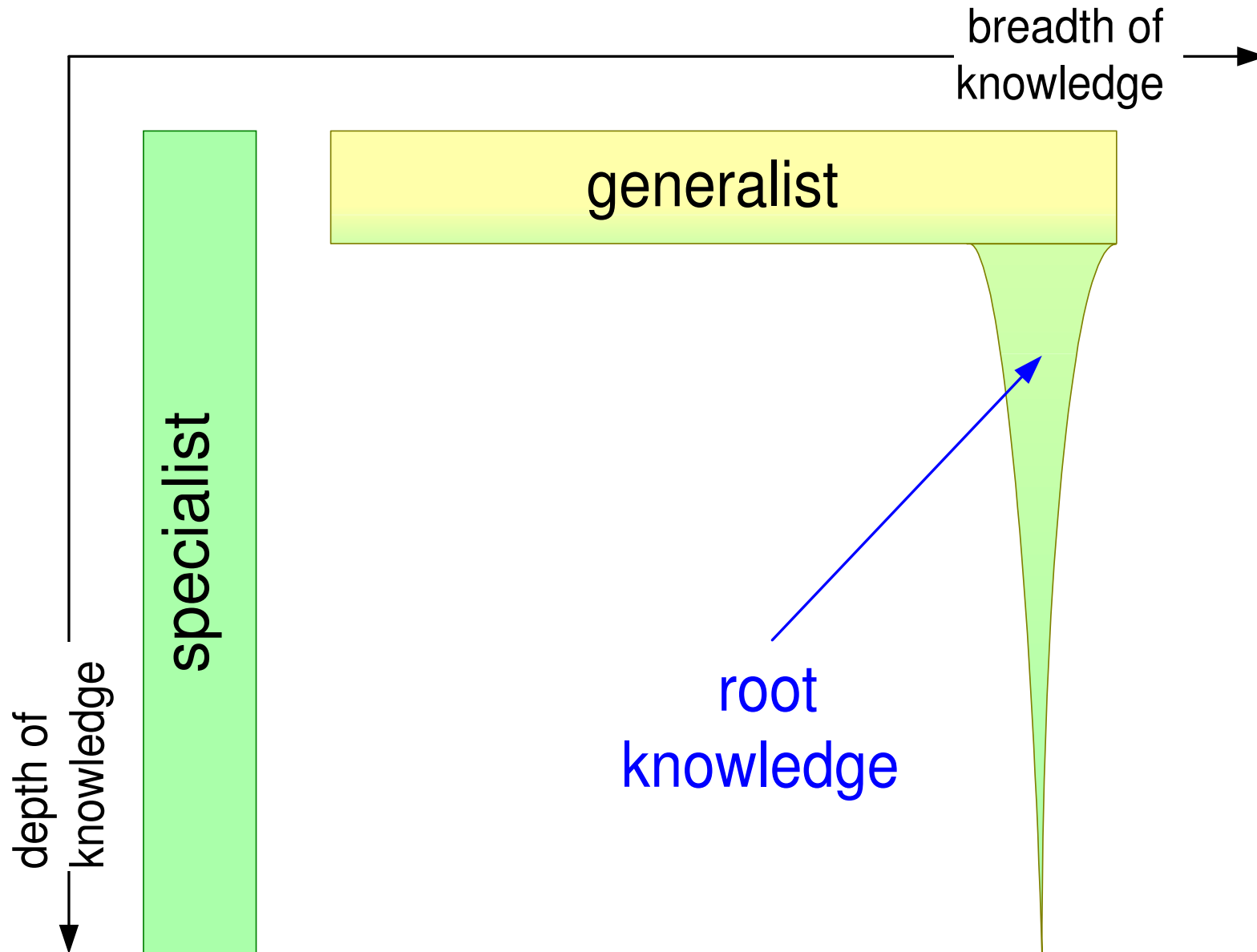


# Typical Growth of a System Architect

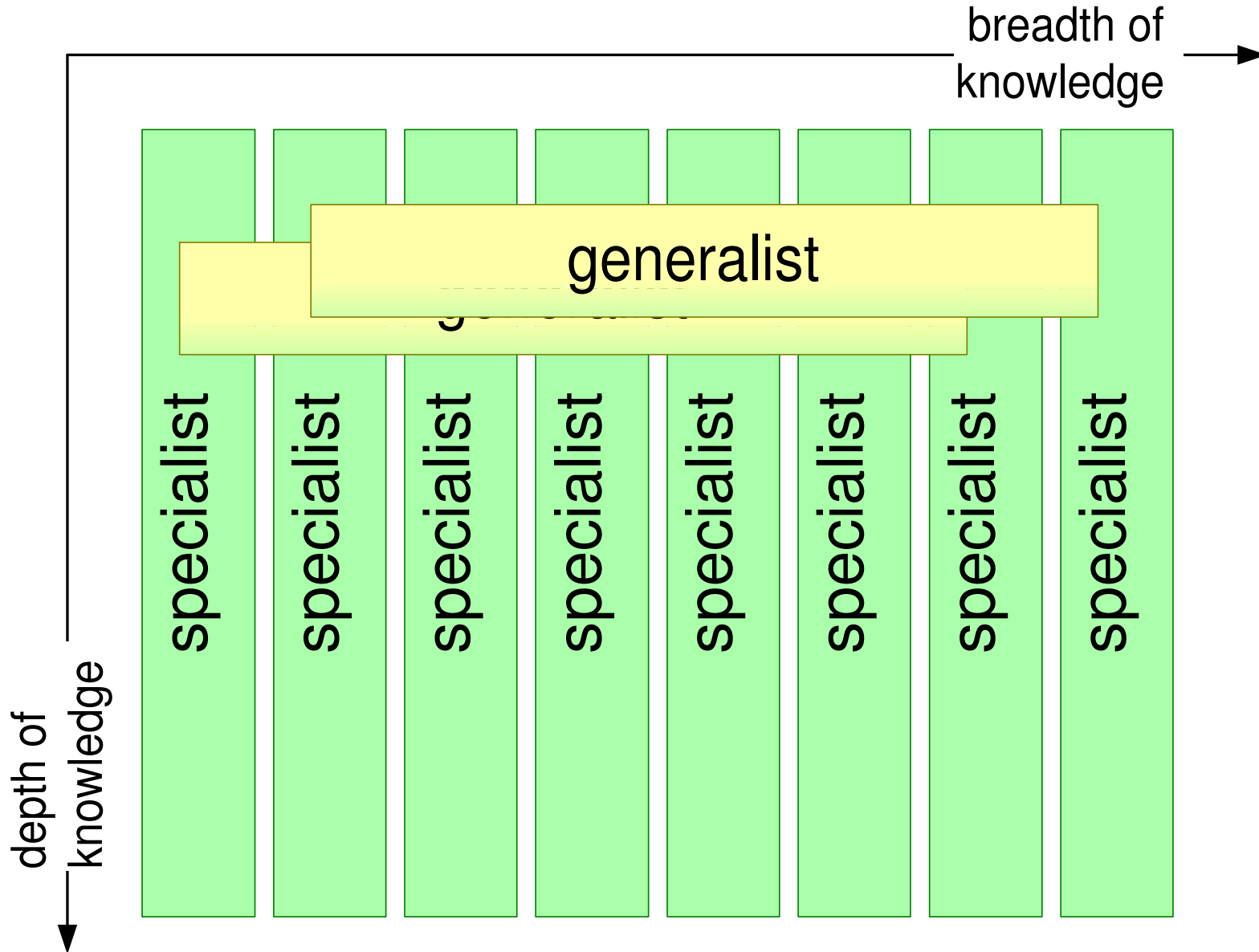
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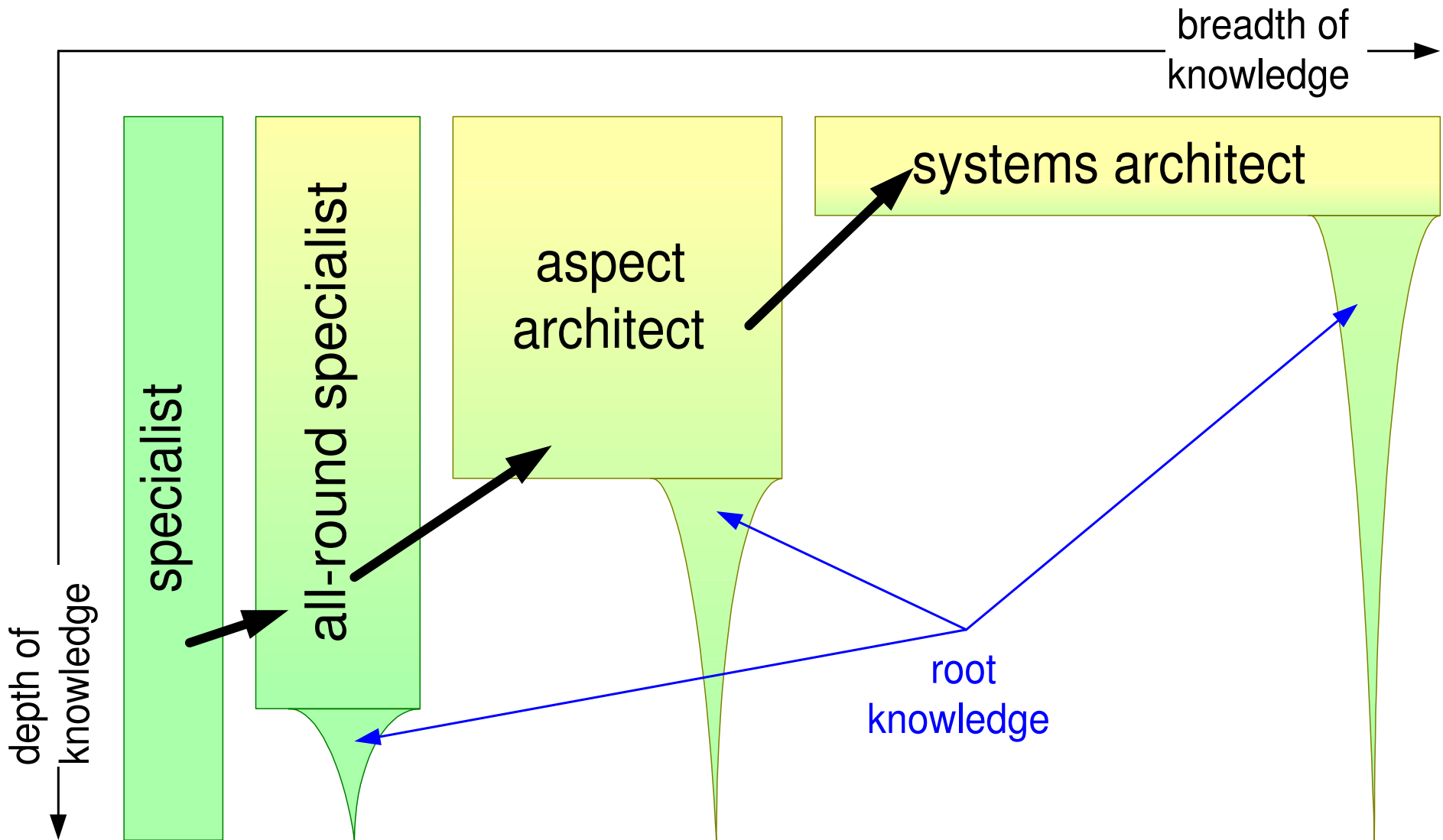
# Generalist versus Specialist



# Generalists and Specialists are Complementary



# Spectrum from Specialist to System Architect



# Architecting Interaction Styles

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## Abstract

A system architects needs skills to apply different interactions styles, depending on the circumstances. This document discusses the following interaction styles: provocation, facilitation, leading, empathic, interviewing, white board simulation, and judo tactics.

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provocation	when in an impasse: provoke effective when used sparsely
facilitation	especially recommended when new in a field: contribute to the team, while absorbing new knowledge
leading	provide vision and direction, make choices risk: followers stop to give the needed feedback
empathic	take the viewpoint of the stakeholder acknowledge the stakeholder's feelings, needs, concerns
interviewing	investigate by asking questions
whiteboard simulation	invite a few engineers and walk through the system operation step by step
judo tactics	first listen to the stakeholder and then explain cost and alternative opportunities

# Architecting Styles

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# Exercise Role and Task of the System Architect

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Role play with 3 roles and optional observer:

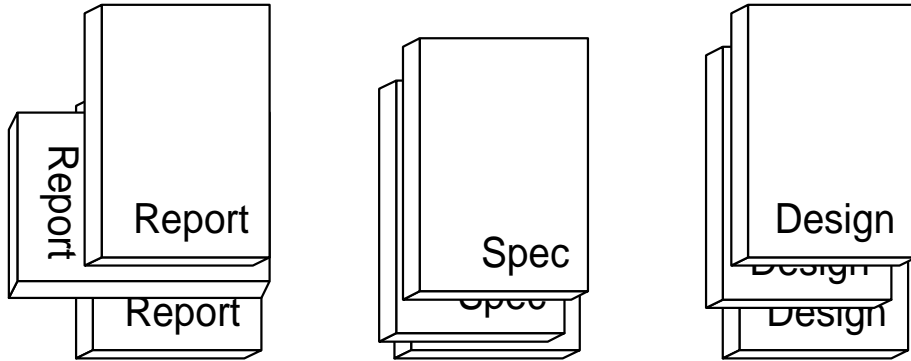
- 1 operational leader (project leader)
- 1 system architect
- 1 marketing manager
- 1 observer (optional)

Discuss the definition (business relevance, specification, and planning) of a travel e-mail mate.

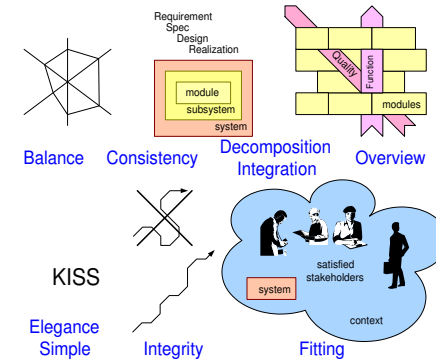
Present (max. 2 flips) the result and the process (the relation and interaction of the three roles).

# Role and Task of a System Architect

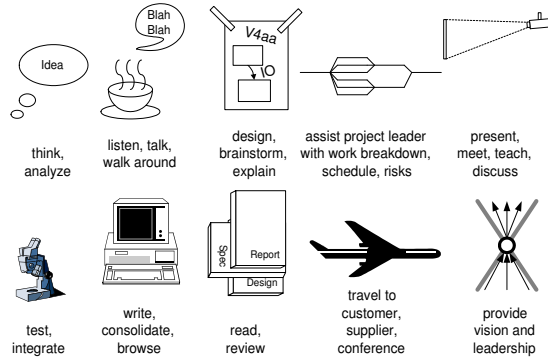
## Deliverables



## Responsibilities



## Daily Activities

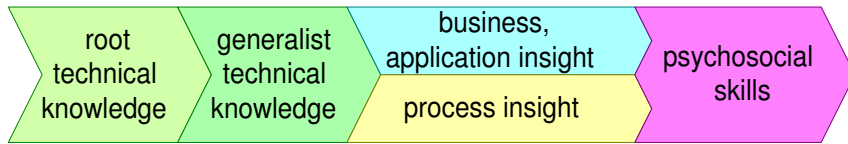


## From detail to overview

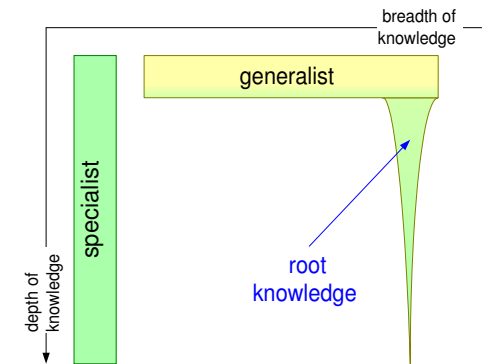
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scanning	product details: $10^7 - 10^{10}$	
	real-world facts: infinite	

# Personal characteristics of a System Architect

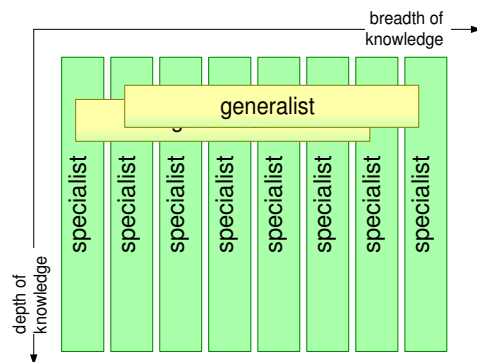
## Typical growth of a Architect



## Generalist vs Specialist



## Complementary Roles



## Role Spectrum

