

Balancing Process and Content; Understanding Architecting in relation with Other Processes

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Abstract

The automotive domain is quite demanding. Trucks and Cars have to be highly dependable (e.g. safe and reliable), and to operate in wildly varying conditions (from harsh environments such as deserts up to extreme winter weather). The life time of the vehicles is decade(s). The production volume demands mass production and well tuned supply chains to operate in a competitive environment. More and faster market and technology changes come on top of all these demands.

Partial solution to this demanding environment is an intricate set of processes. Good processes are crucial. Unfortunately, processes can also hamper the business, for instance by focusing so much on form that content gets lost.

Architecting is an activity that delivers content (needs analysis, requirements, design concepts, design decisions). Architecting can benefit a lot from good

process interaction, reversely it can suffer tremendously from lack of process or overkill of process.

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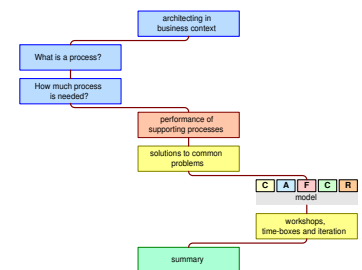
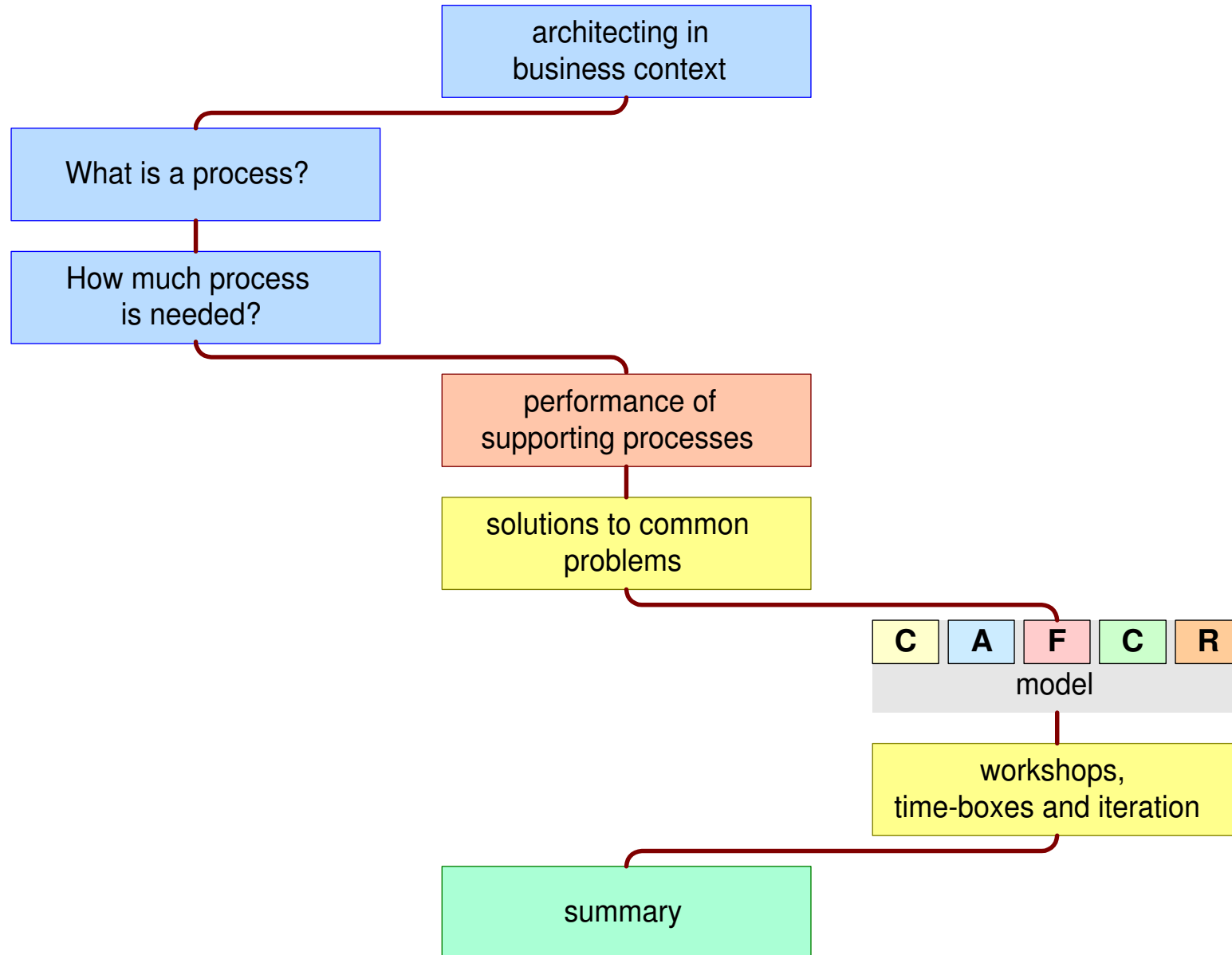
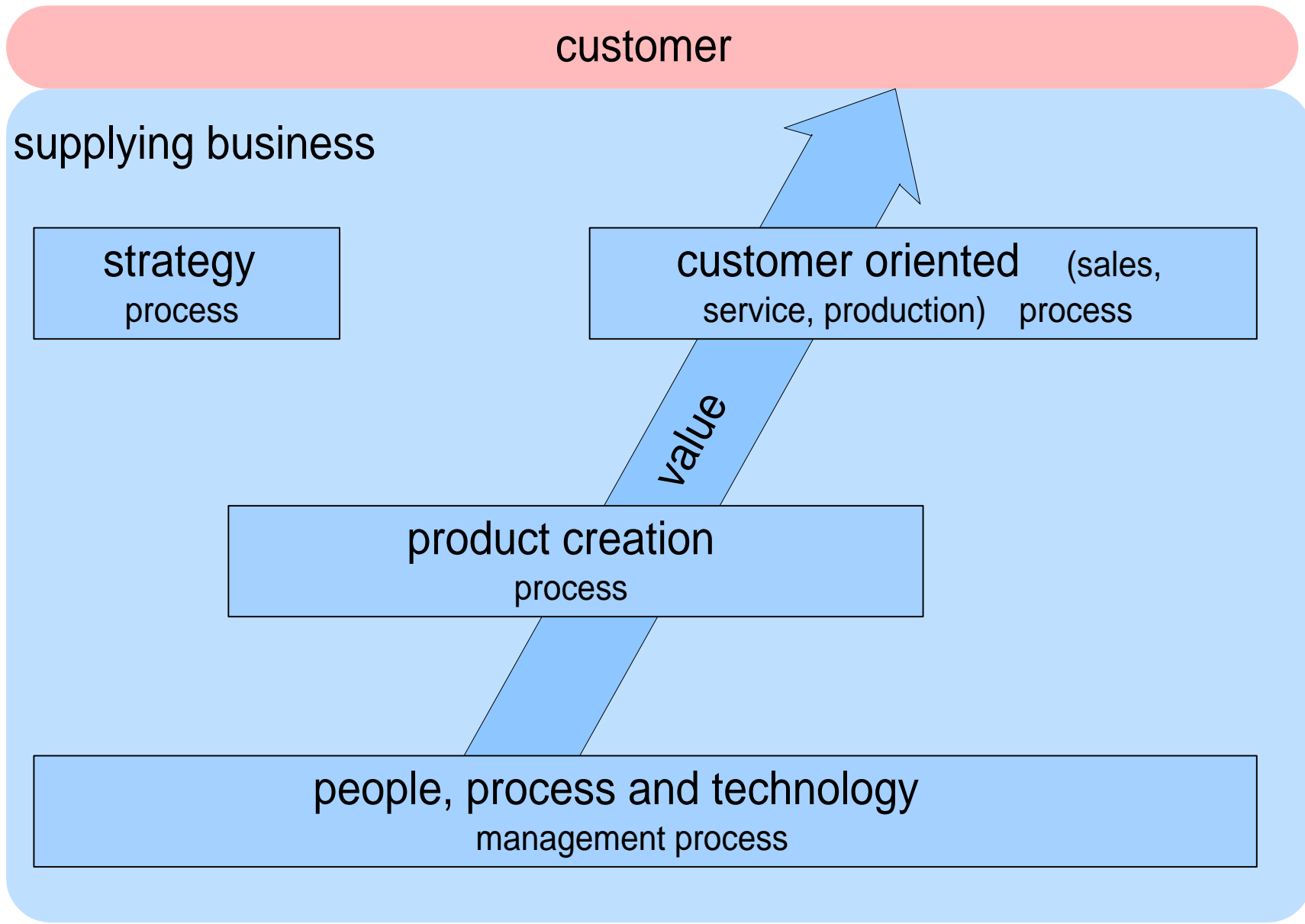


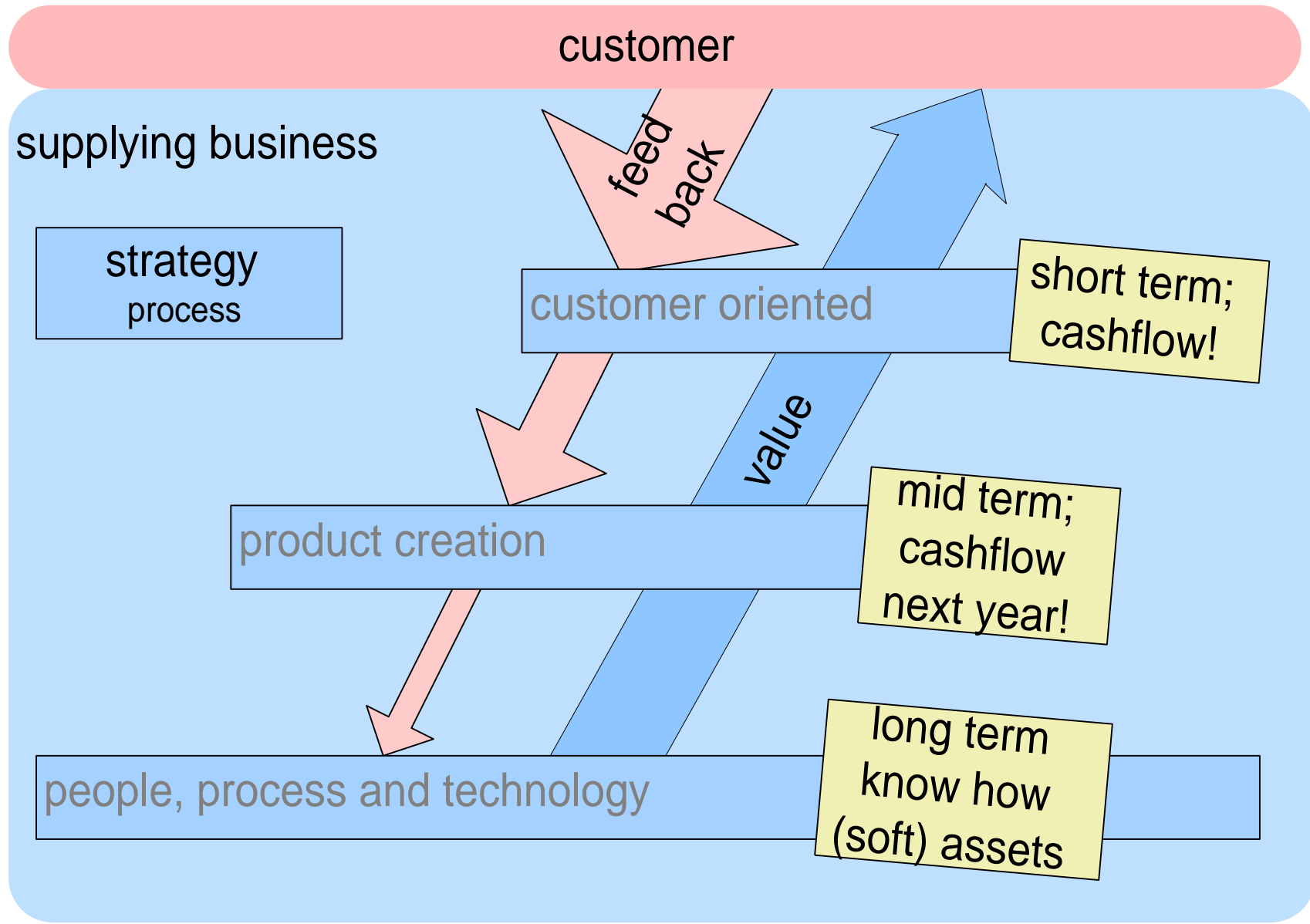
Figure Of Contents™



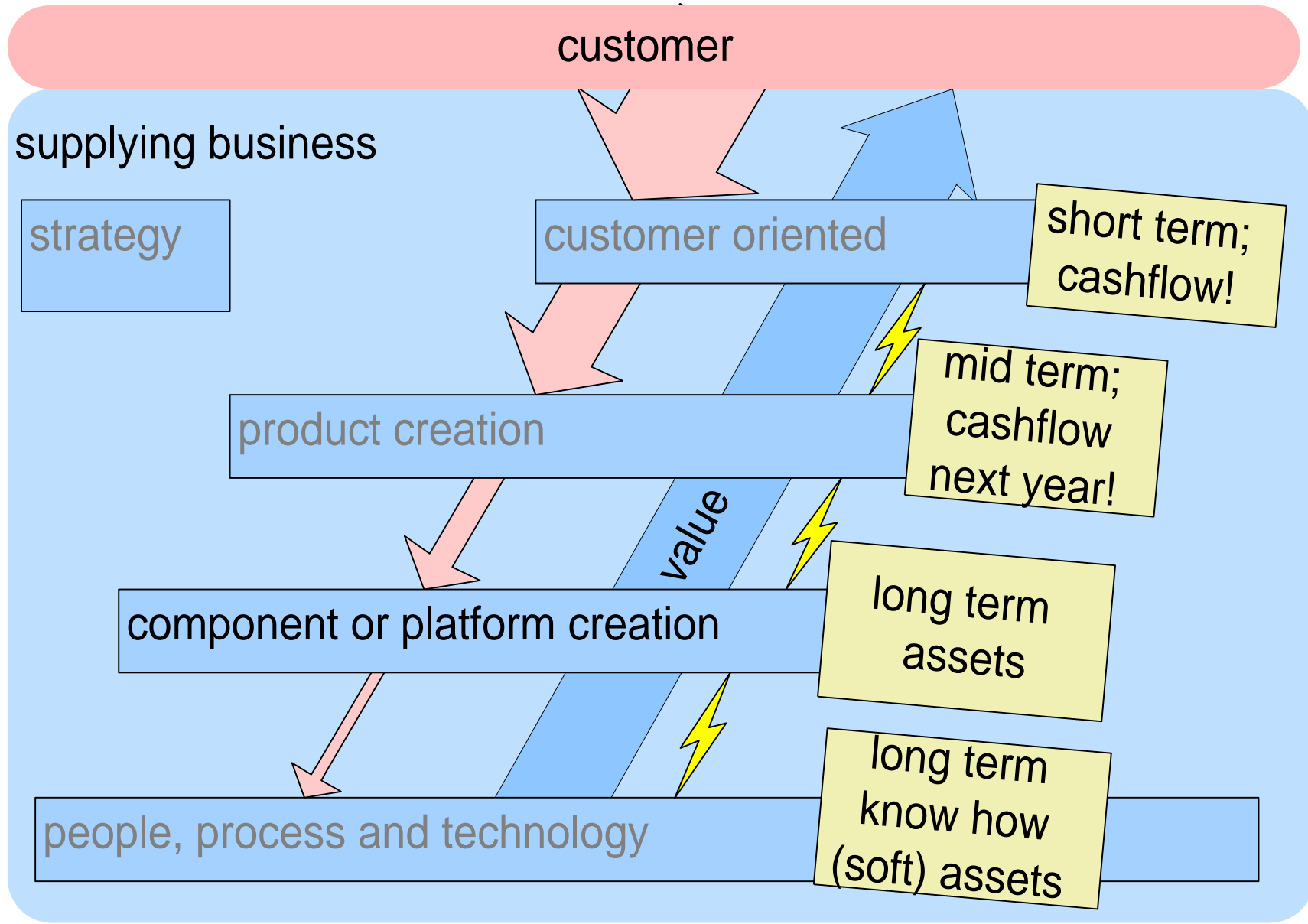
Simplified process view



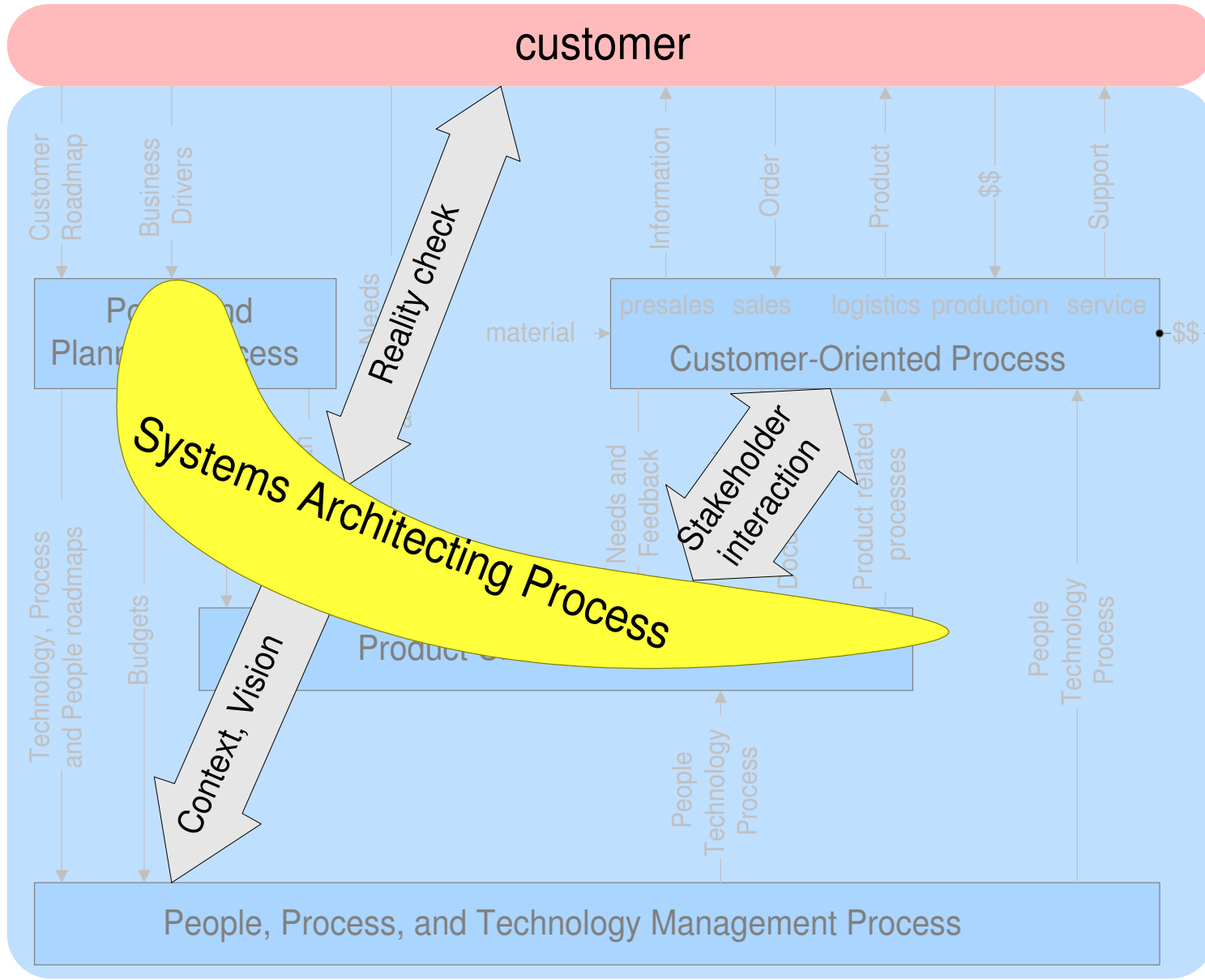
Tension between processes

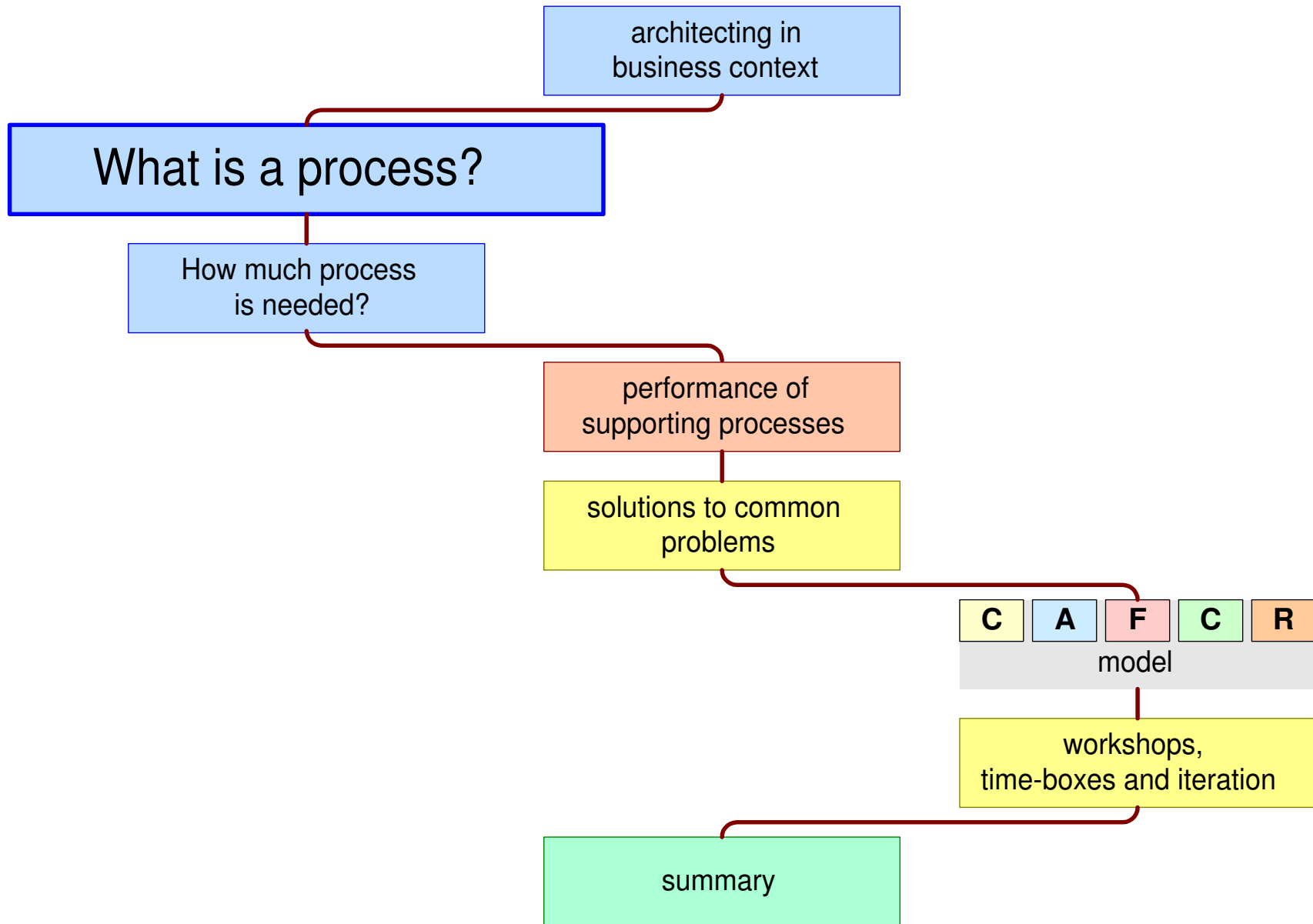


Platform strategy adds one layer



System Architecture Process in Business Context





Purpose What is to be achieved and why

Structure How will the goal be achieved

Rationale What is the reasoning behind this process

Roles What roles are present, what responsibilities are associated, what incentives are present, what are the criteria for these roles

Ordering What phasing or sequence is applied

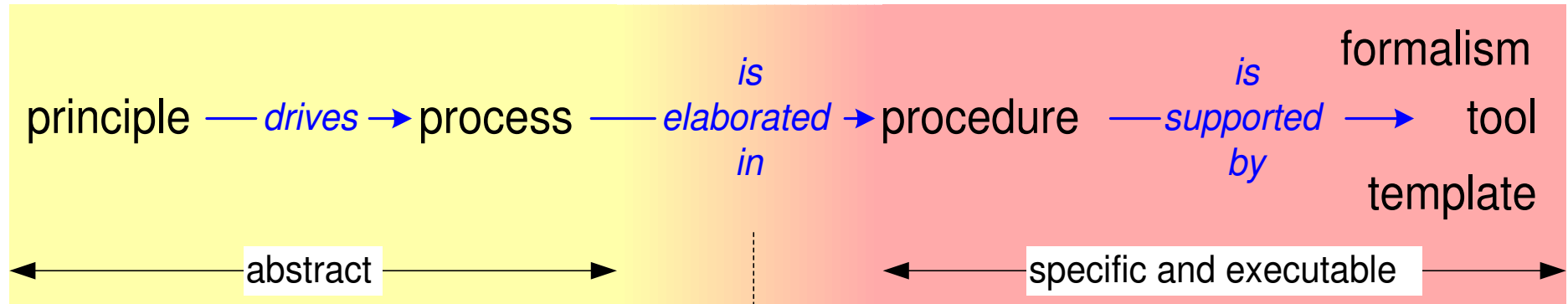
Definition of a Process

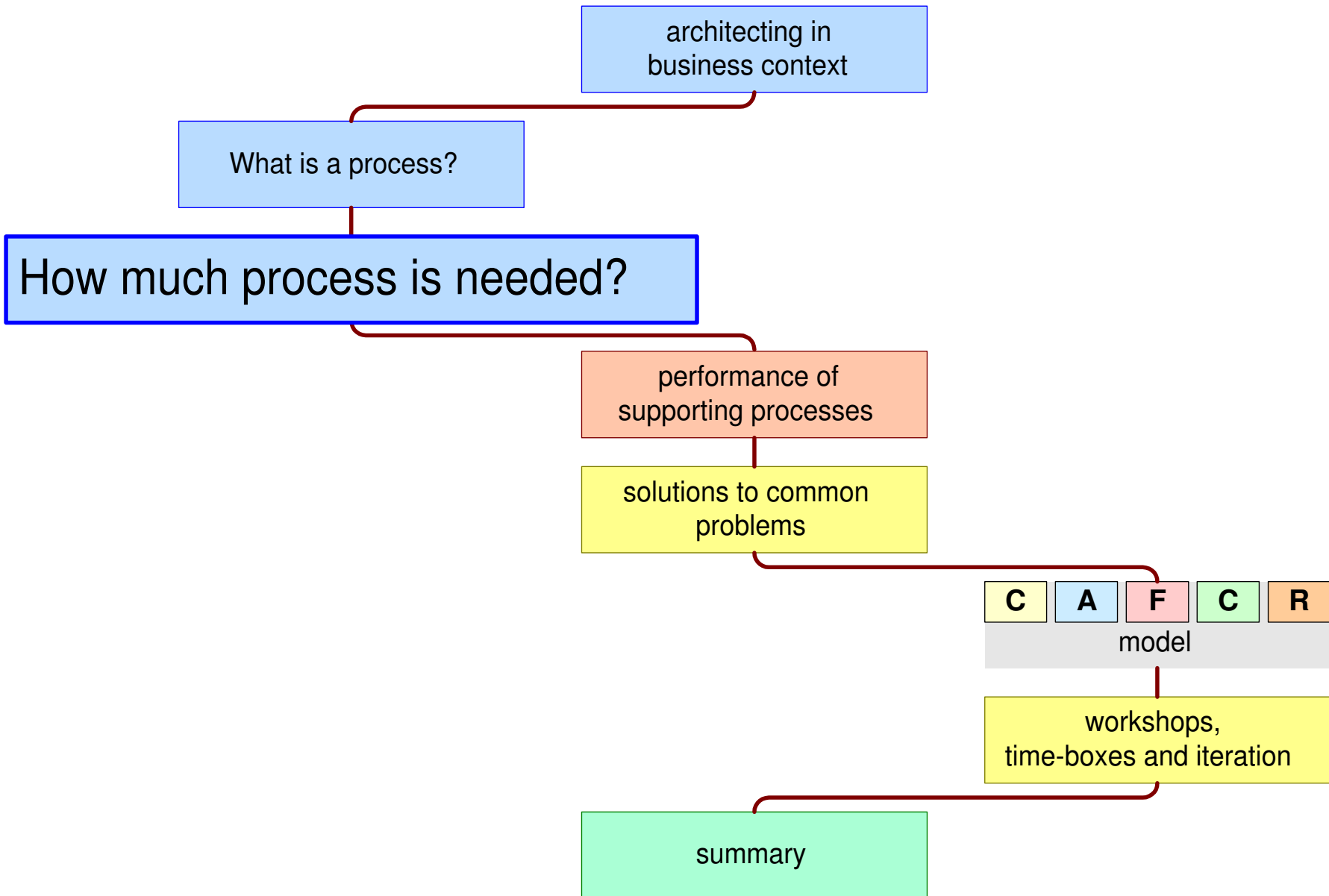
"A process is an activity which takes place over time
and which has a precise aim regarding the result to be achieved.

The concept of a process is hierarchical
which means that a process may consist of
a partially ordered set of subprocesses."

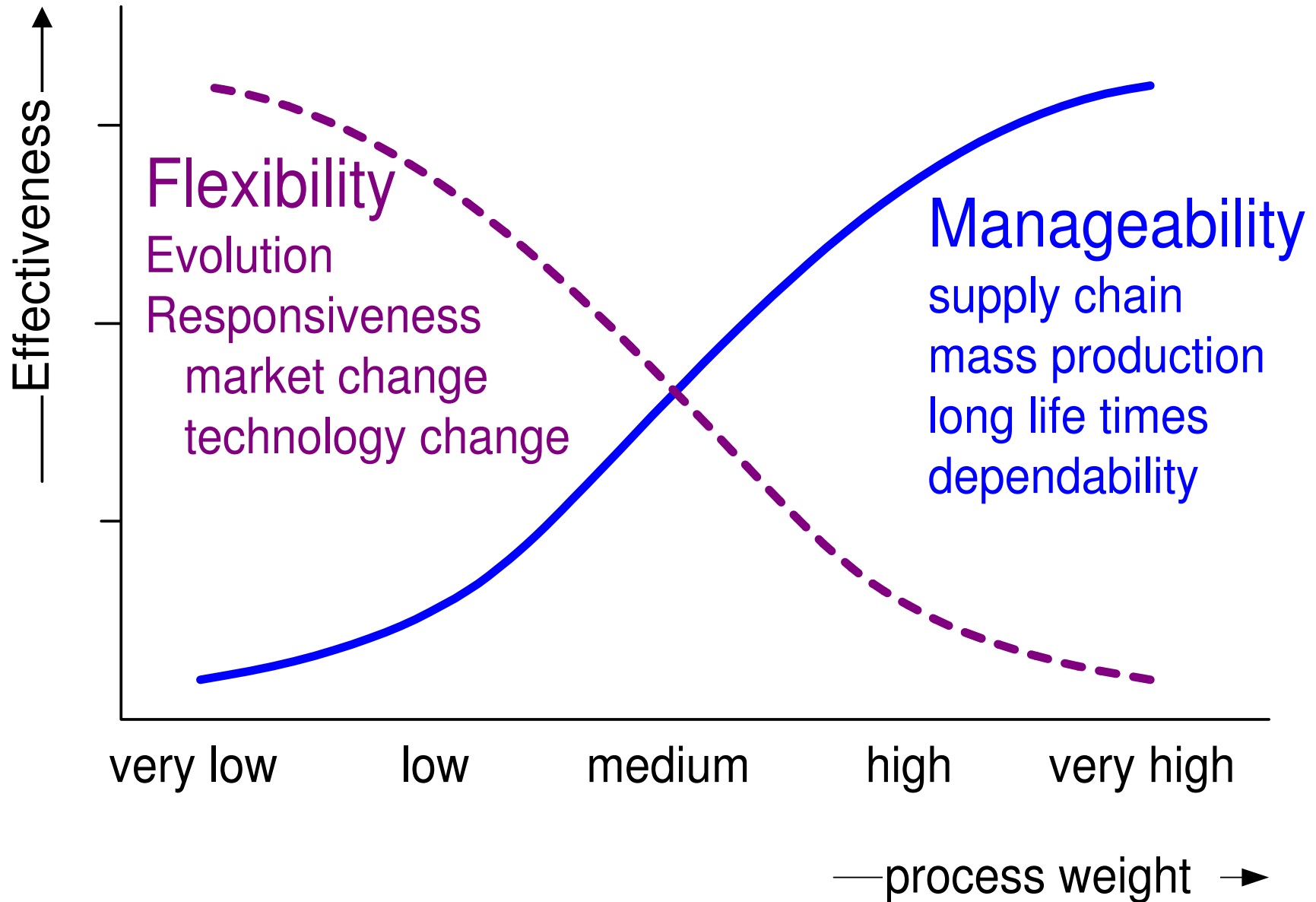
"Method Integration; Concepts and Case Studies" by Klaus Kronlöff

A process within an abstraction hierarchy



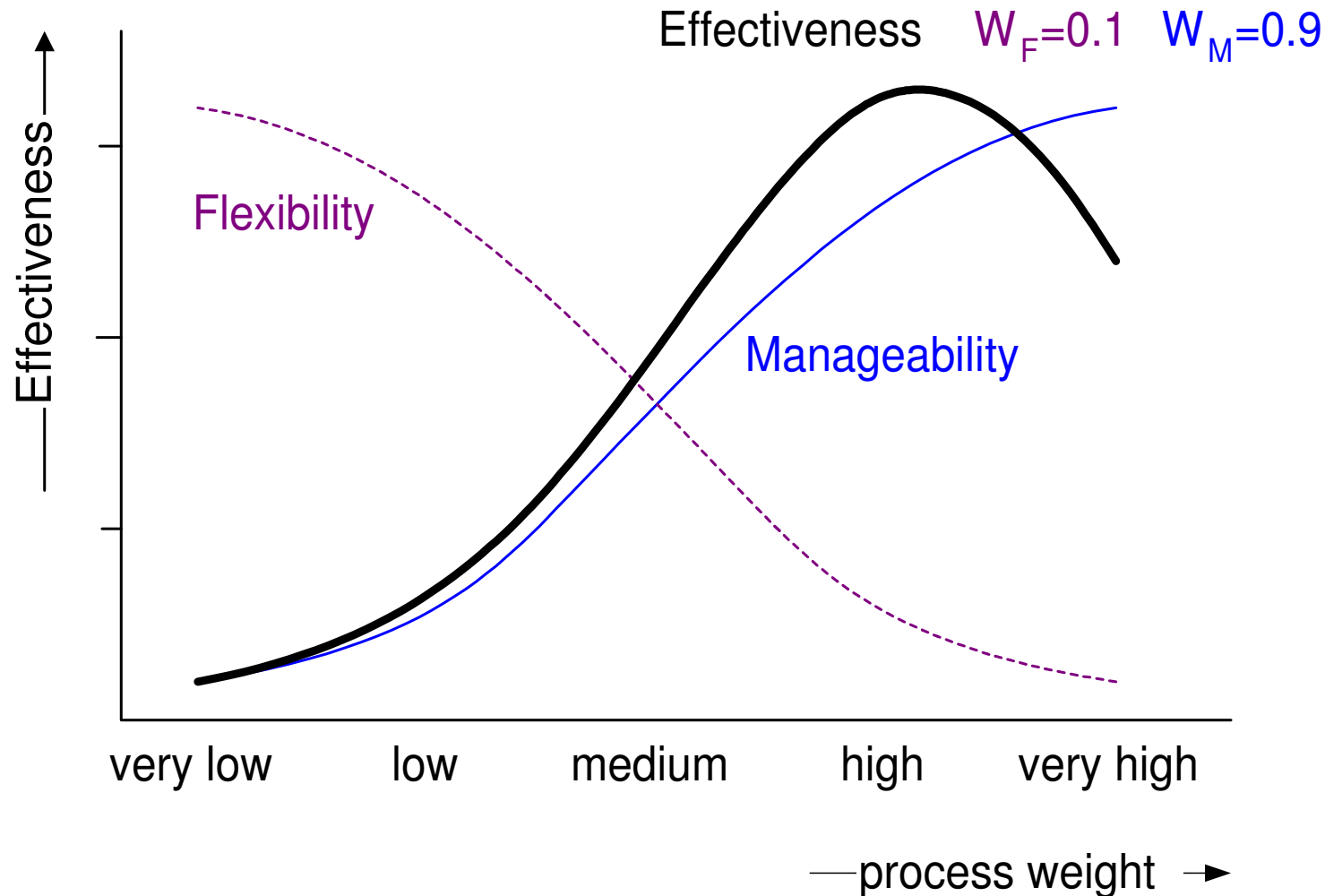


Effectiveness(Flexibility, Manageability)



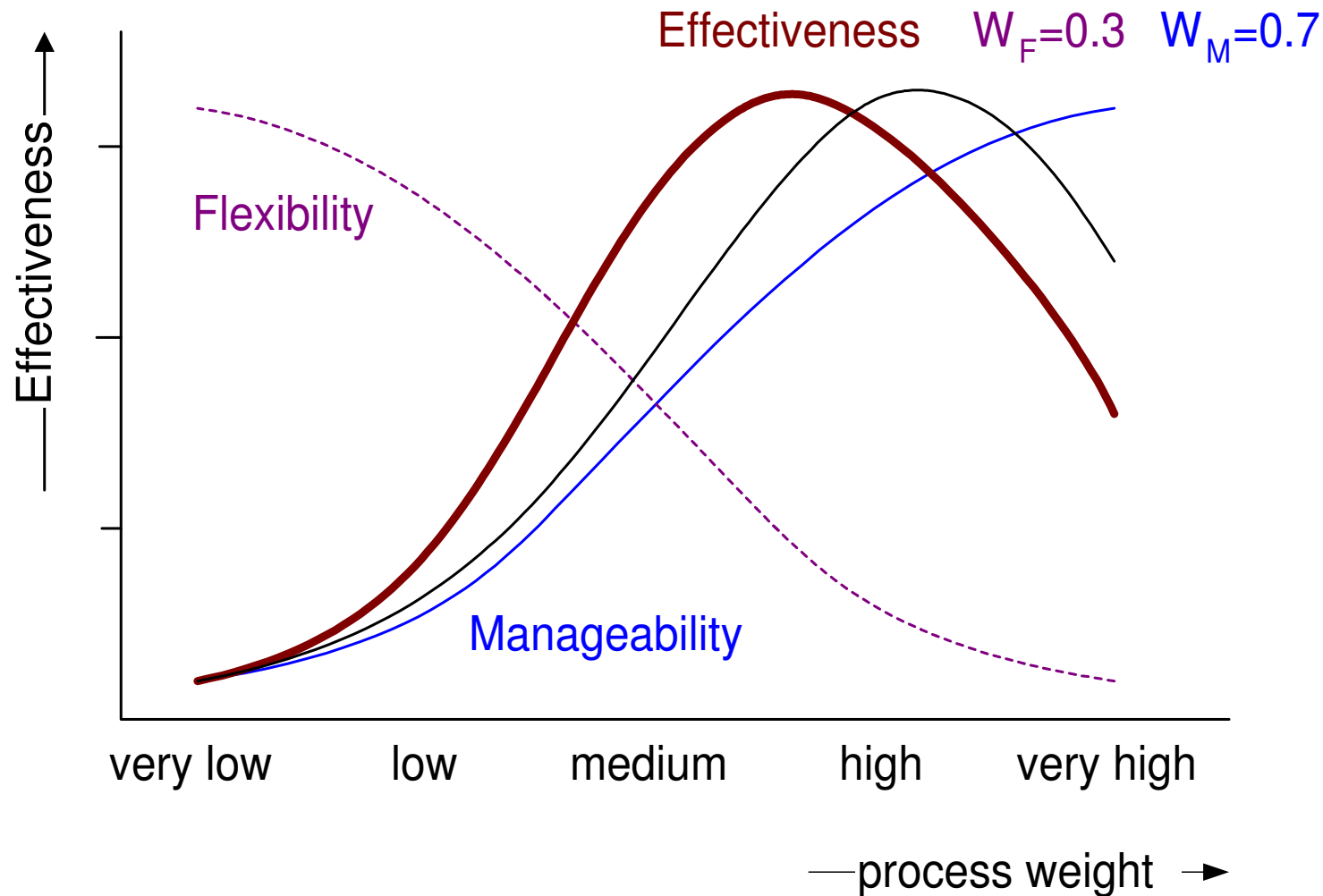
Effectiveness in Defense, Aerospace, Automotive

$$\text{Effectiveness} = \text{Flexibility}^{W_F} * \text{Manageability}^{W_M}$$

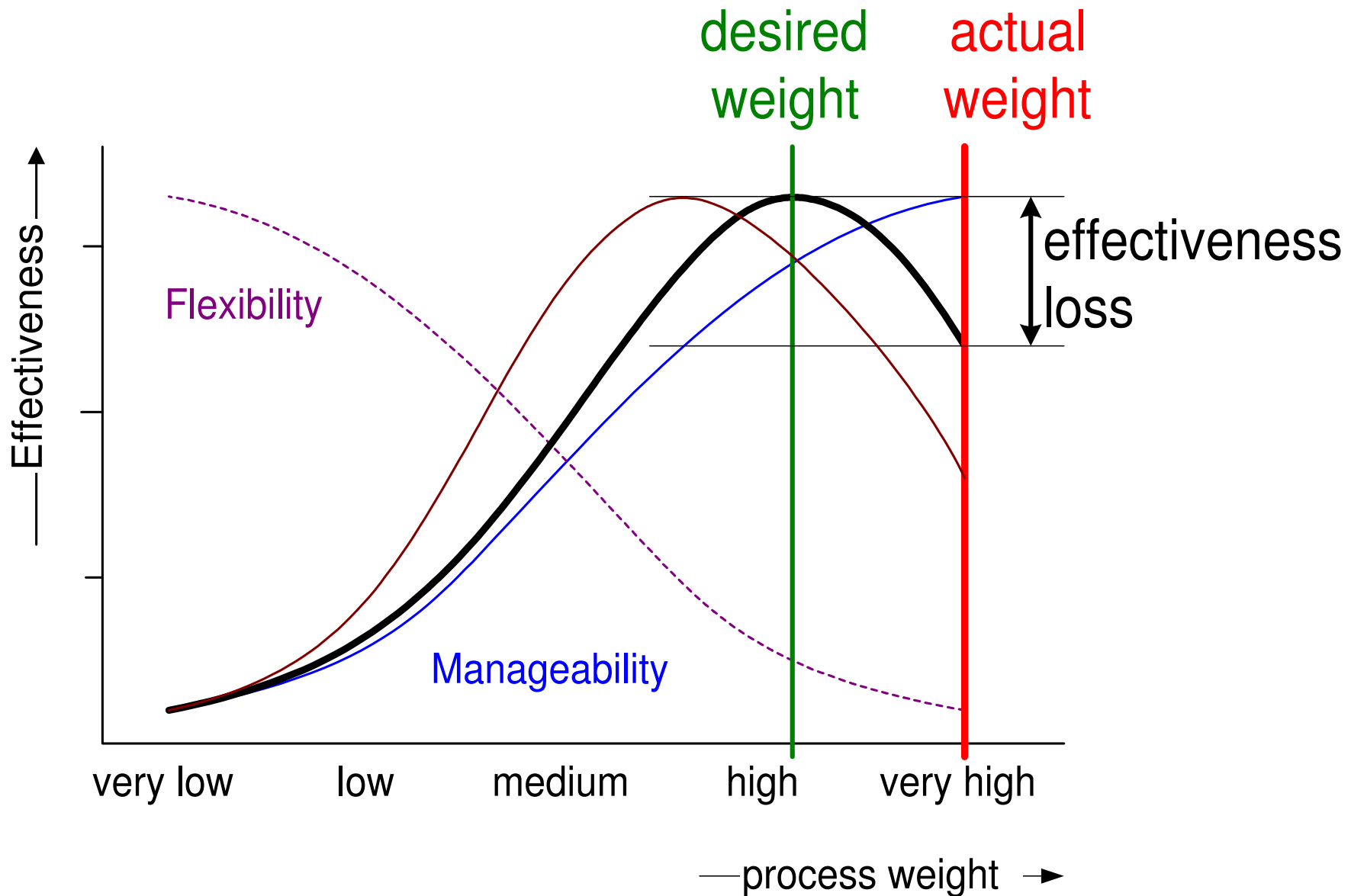


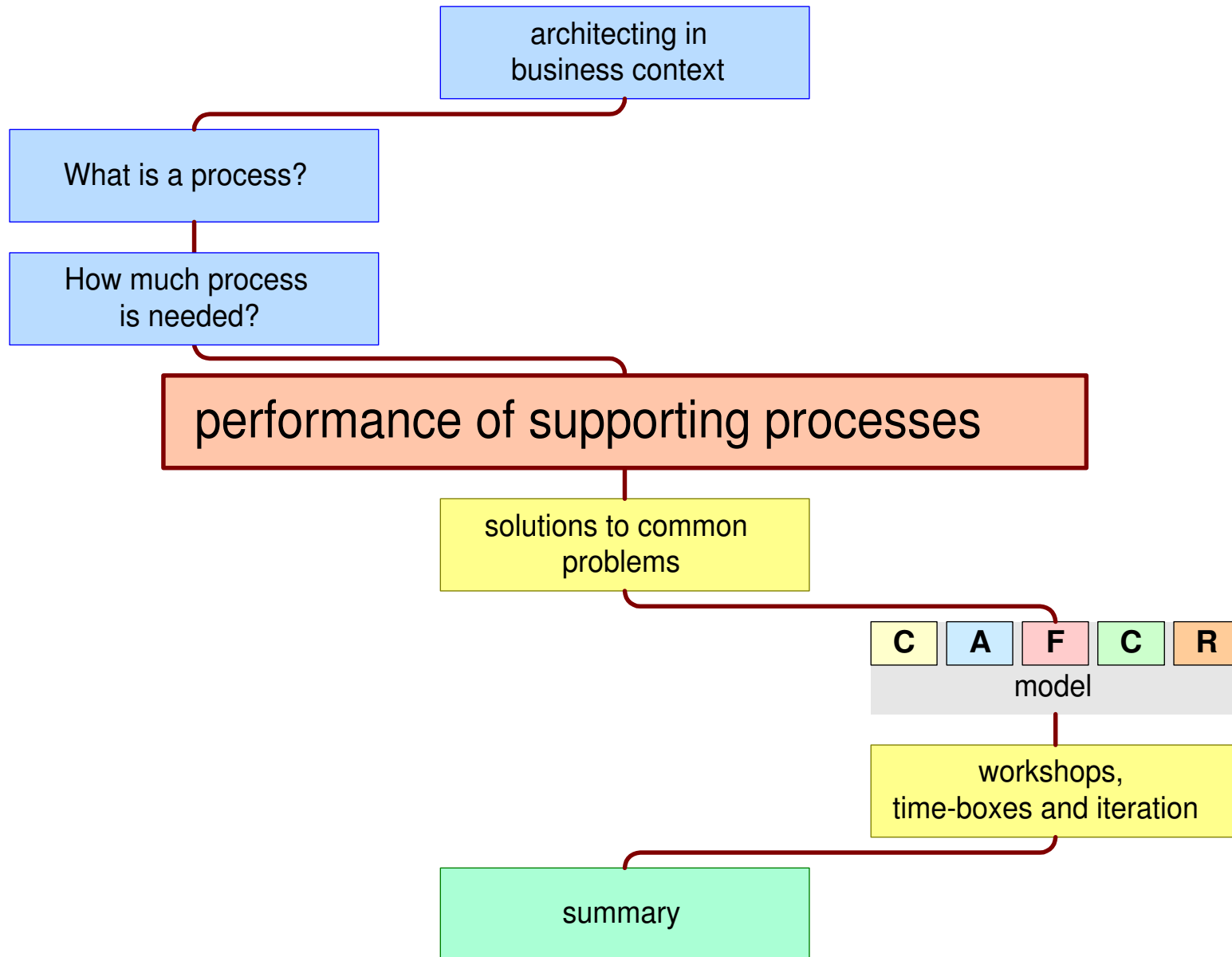
If Balance Shifts

$$\text{Effectiveness} = \text{Flexibility}^{W_F} * \text{Manageability}^{W_M}$$

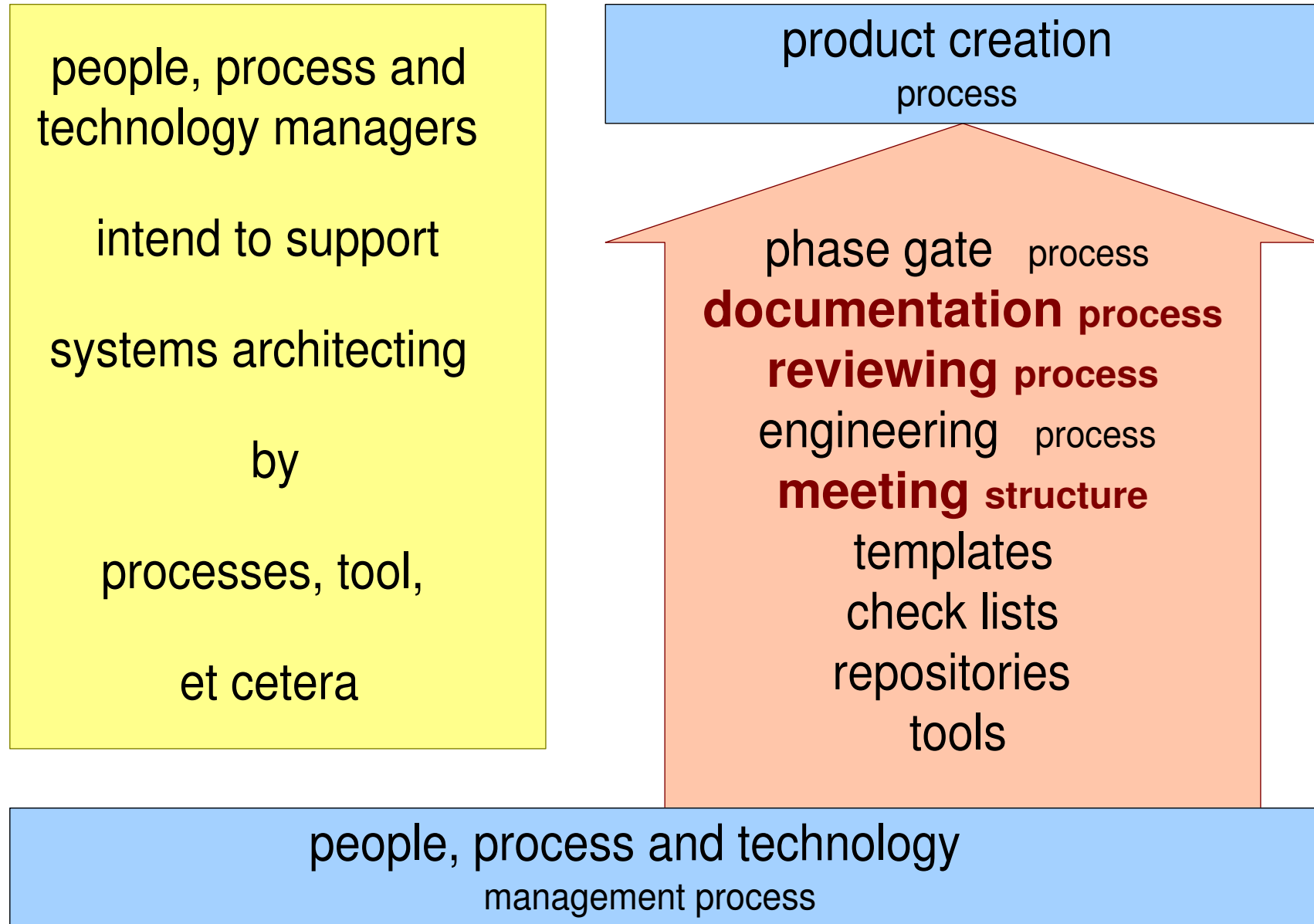


Typical Situation in Defense





Supporting Processes for Architecting



How effective are these Processes?

How many hours per week do you sit in meetings?

How many hours per week does the system architect spend on writing documentation?

How satisfied are the consumers of documentation?

How easy can information be found?

How up-to-date is the information?

How timely is documentation available?

What is the quality of the review process?

Does the system architect feel supported by the processes at all times?

Common Problems

large monolithic documents

late, not up-to-date, time consuming to review and update

system architects spending 70%+ of time in meetings

ineffective reviews

too many reviewers, lack of ownership, too little time and attention, form rather than content

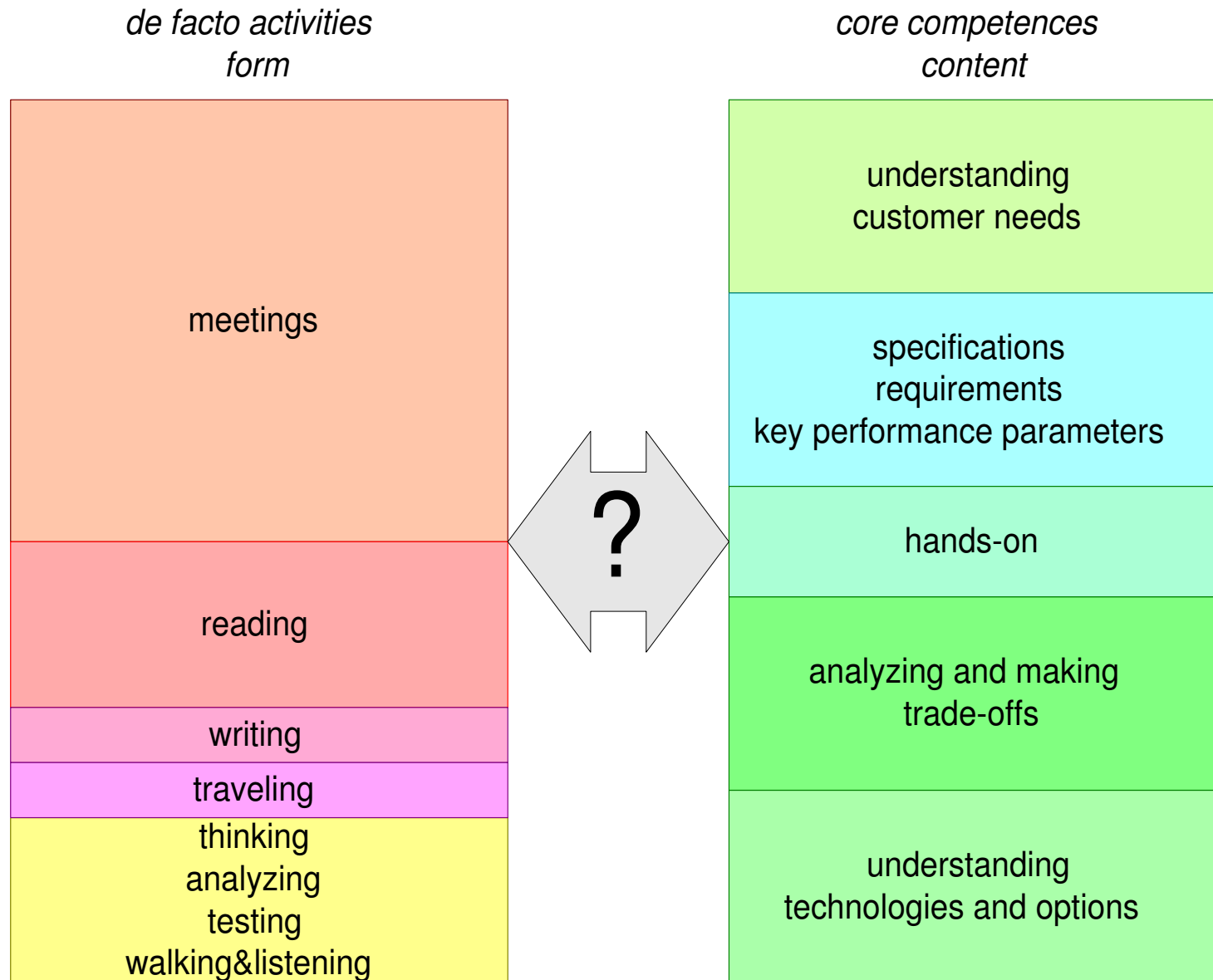
noise generation due to too much prescribing templates or frameworks

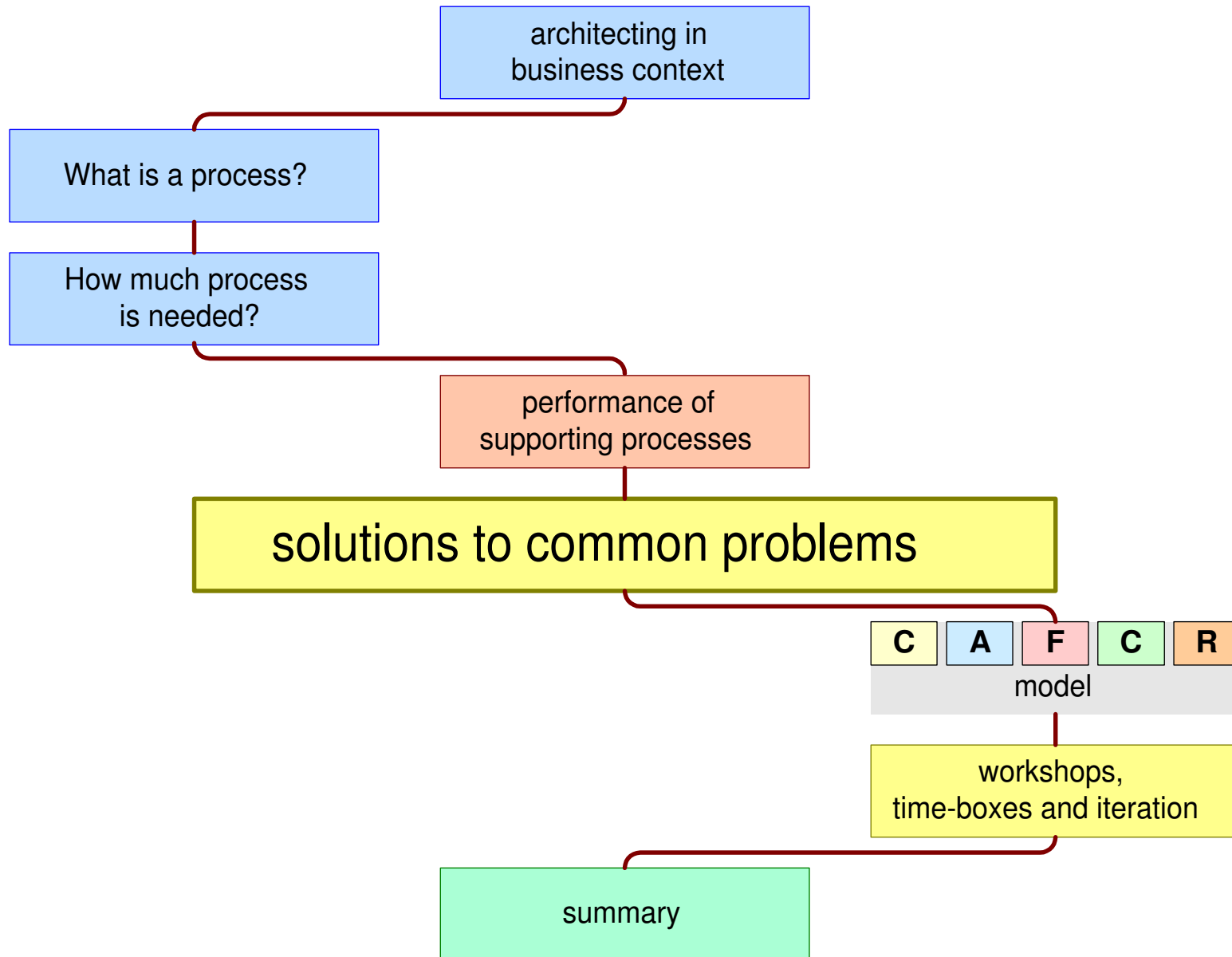
information overload, essentials are hidden

poorly searchable repositories

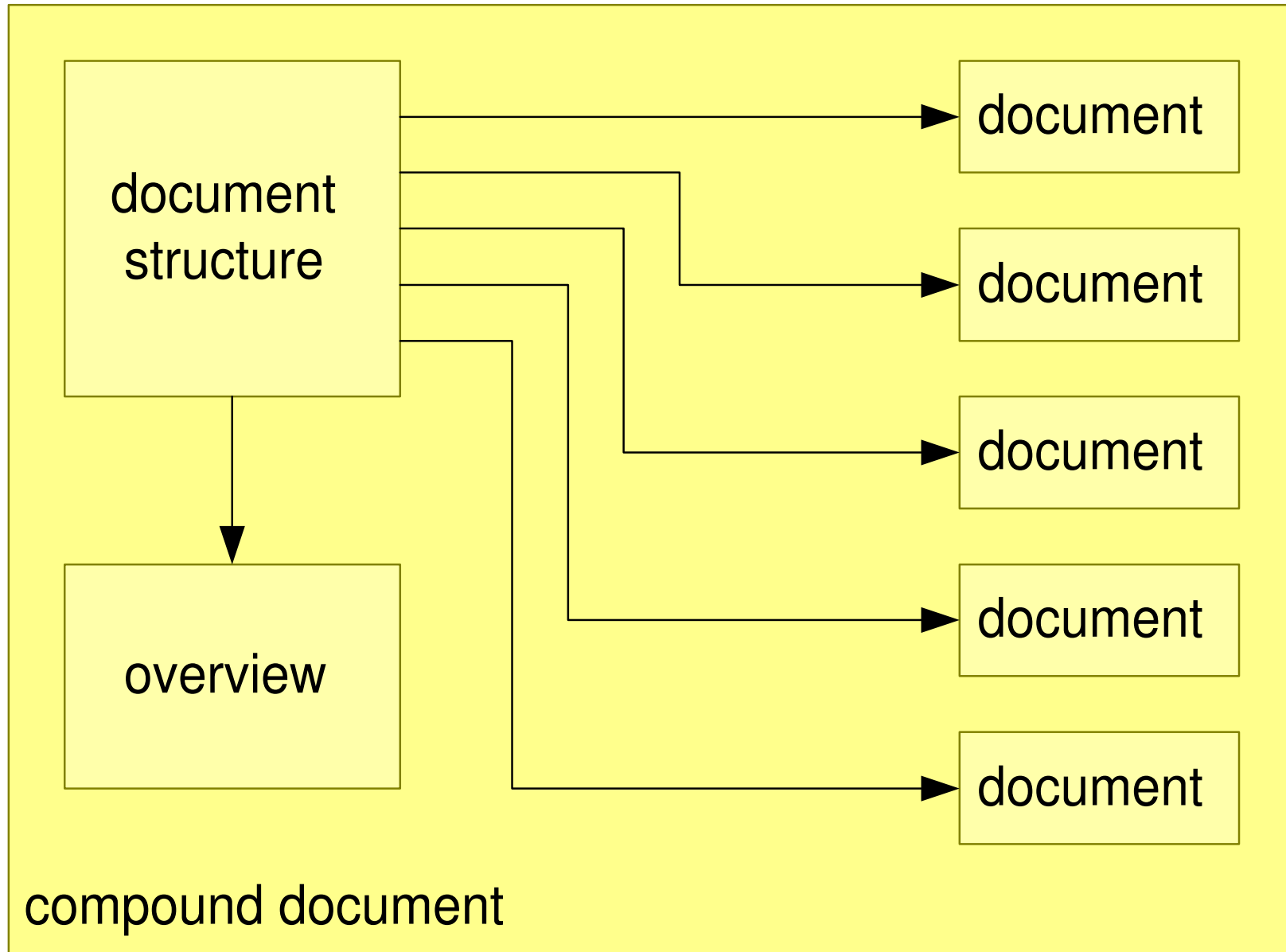
data and information cannot be found

Balance Form and Content

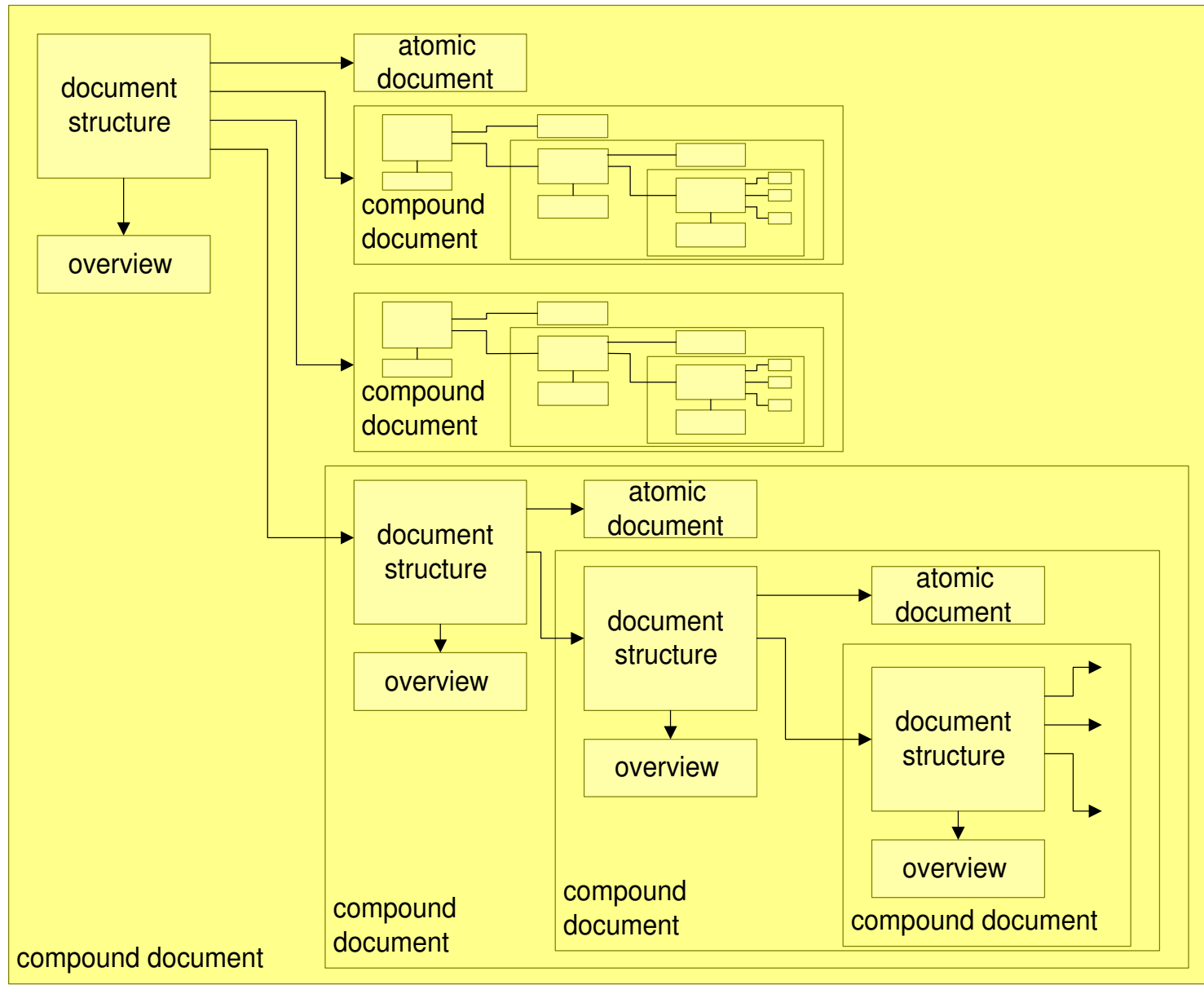




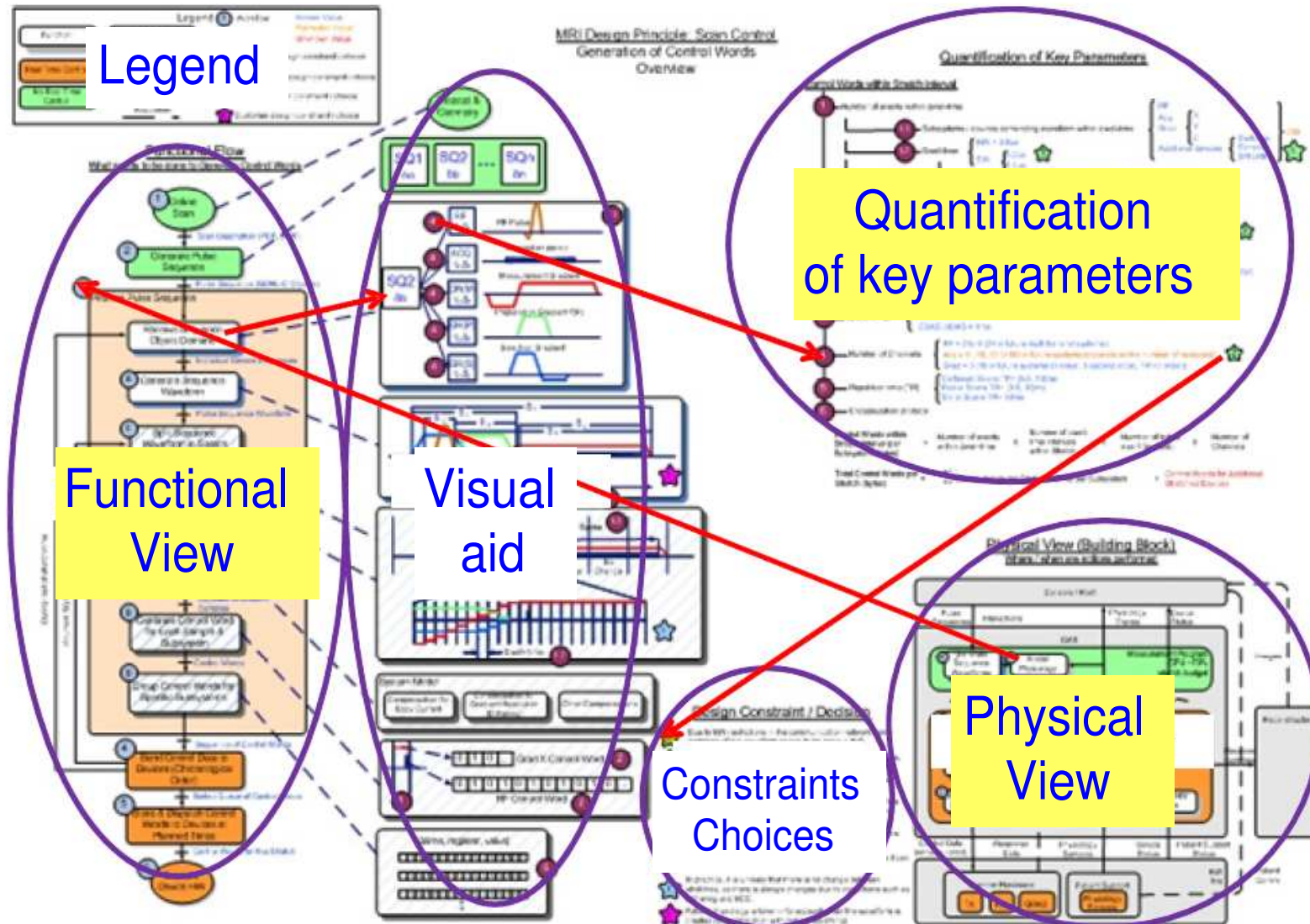
Design Modular Documentation



Recursive as "Normal" Designs

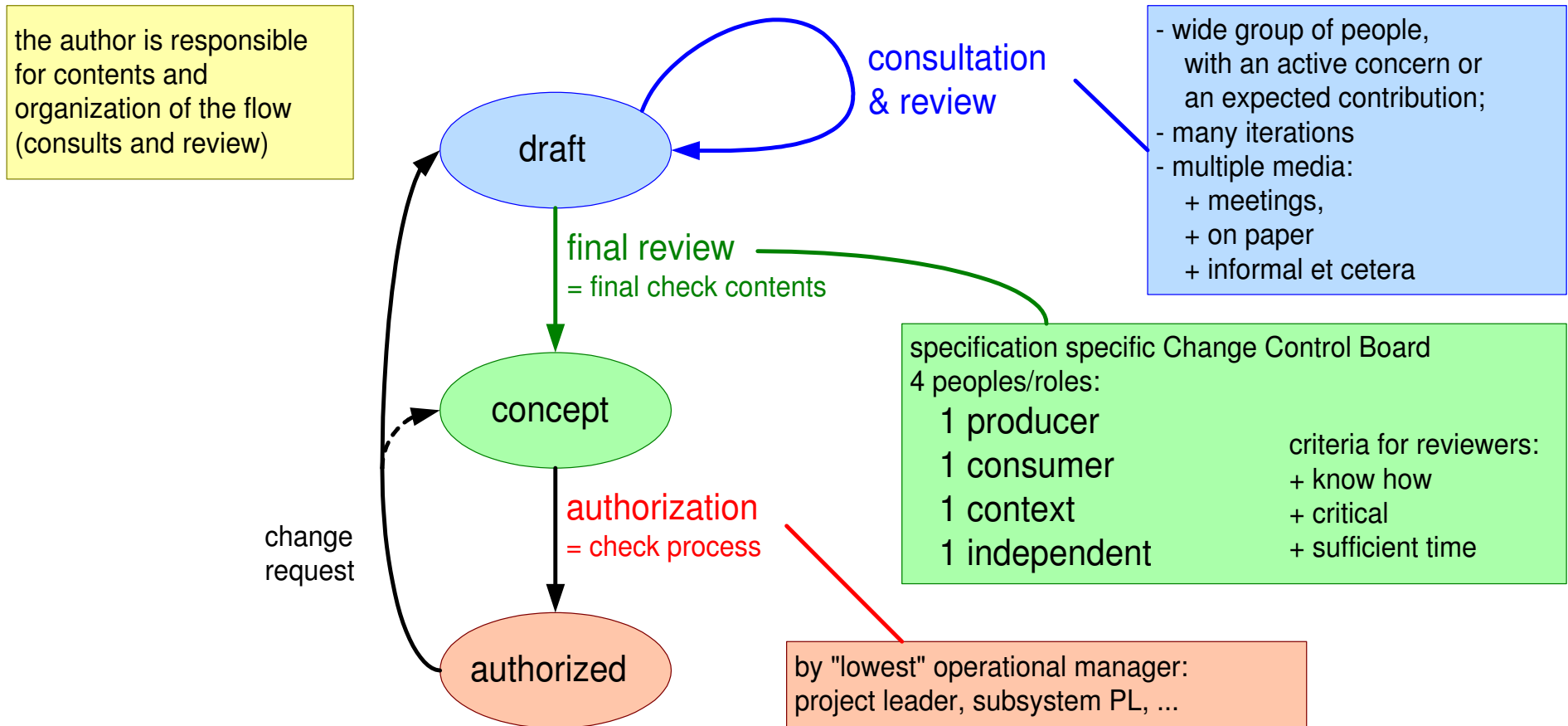


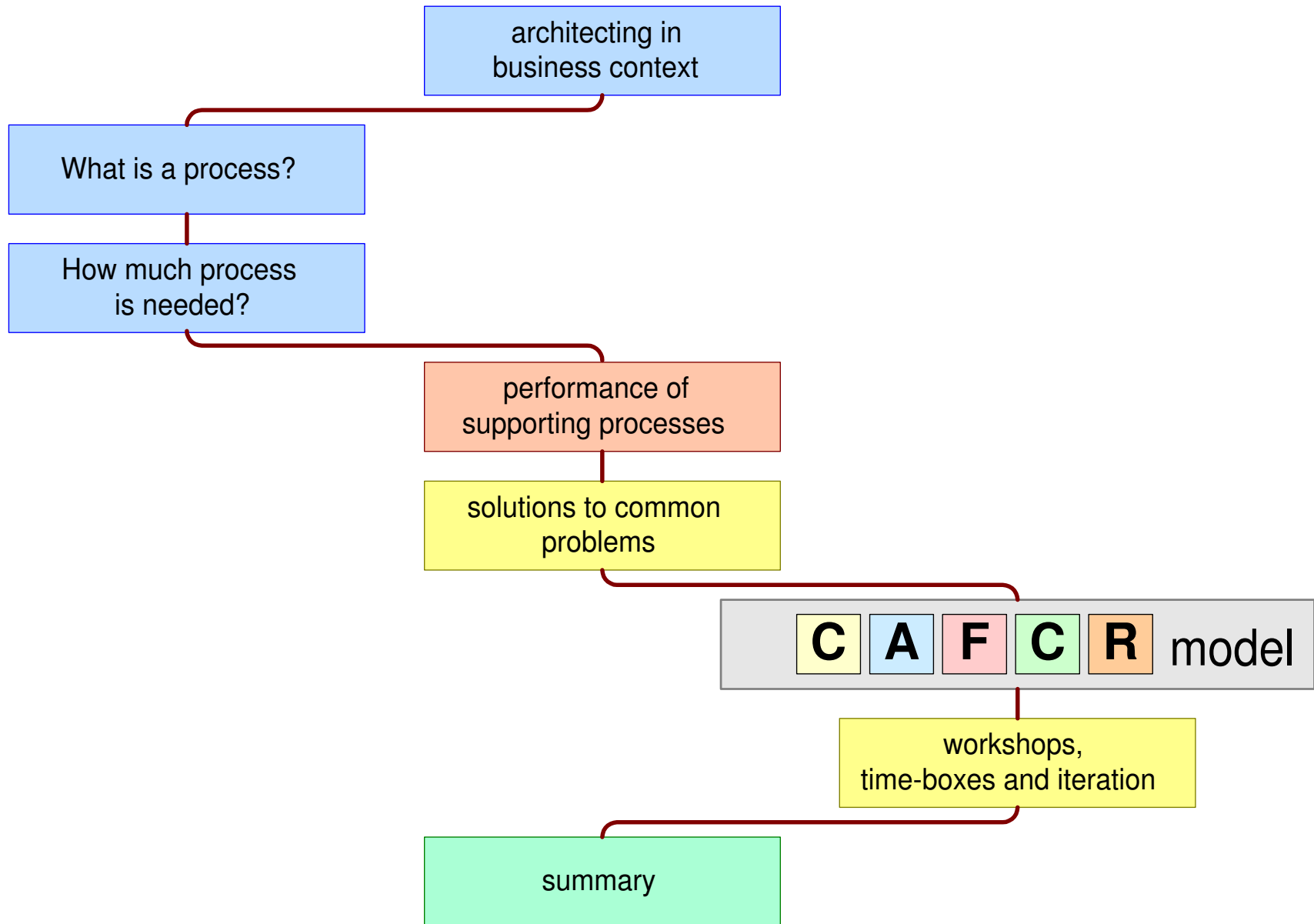
Documenting with A3's



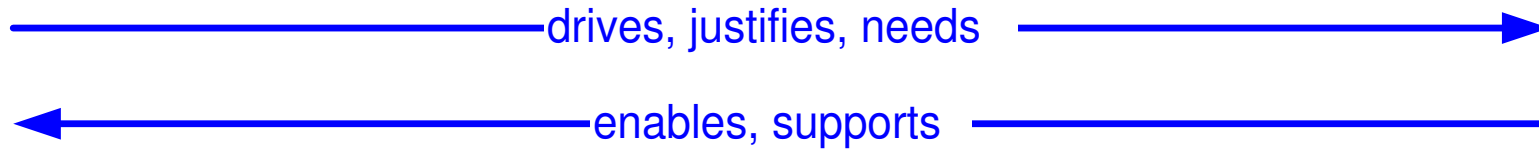
A3 Architecture Overviews Focusing architectural knowledge to support evolution of complex systems
by: Daniel Borches and Maarten Bonnema, INCOSE 2010

Light-weight Distributed Reviews

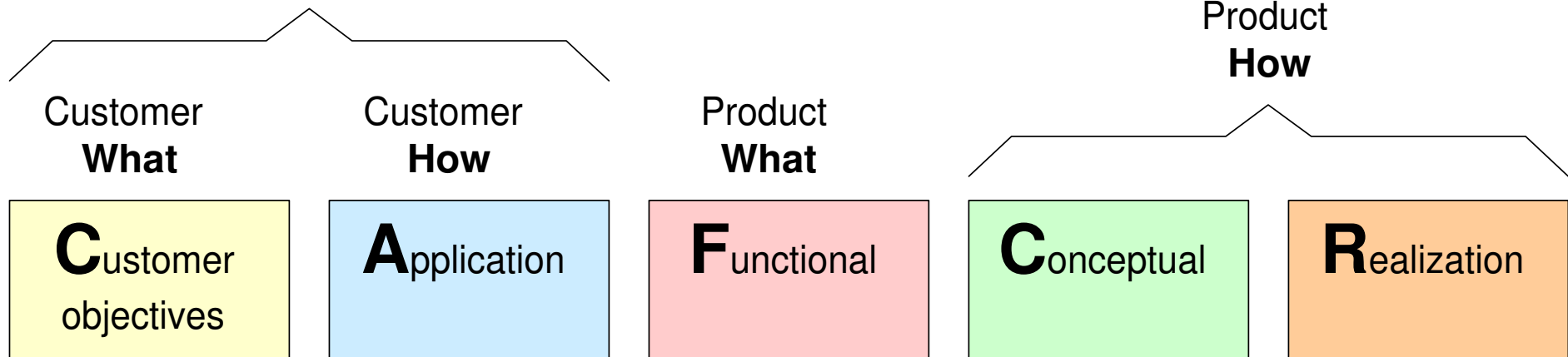




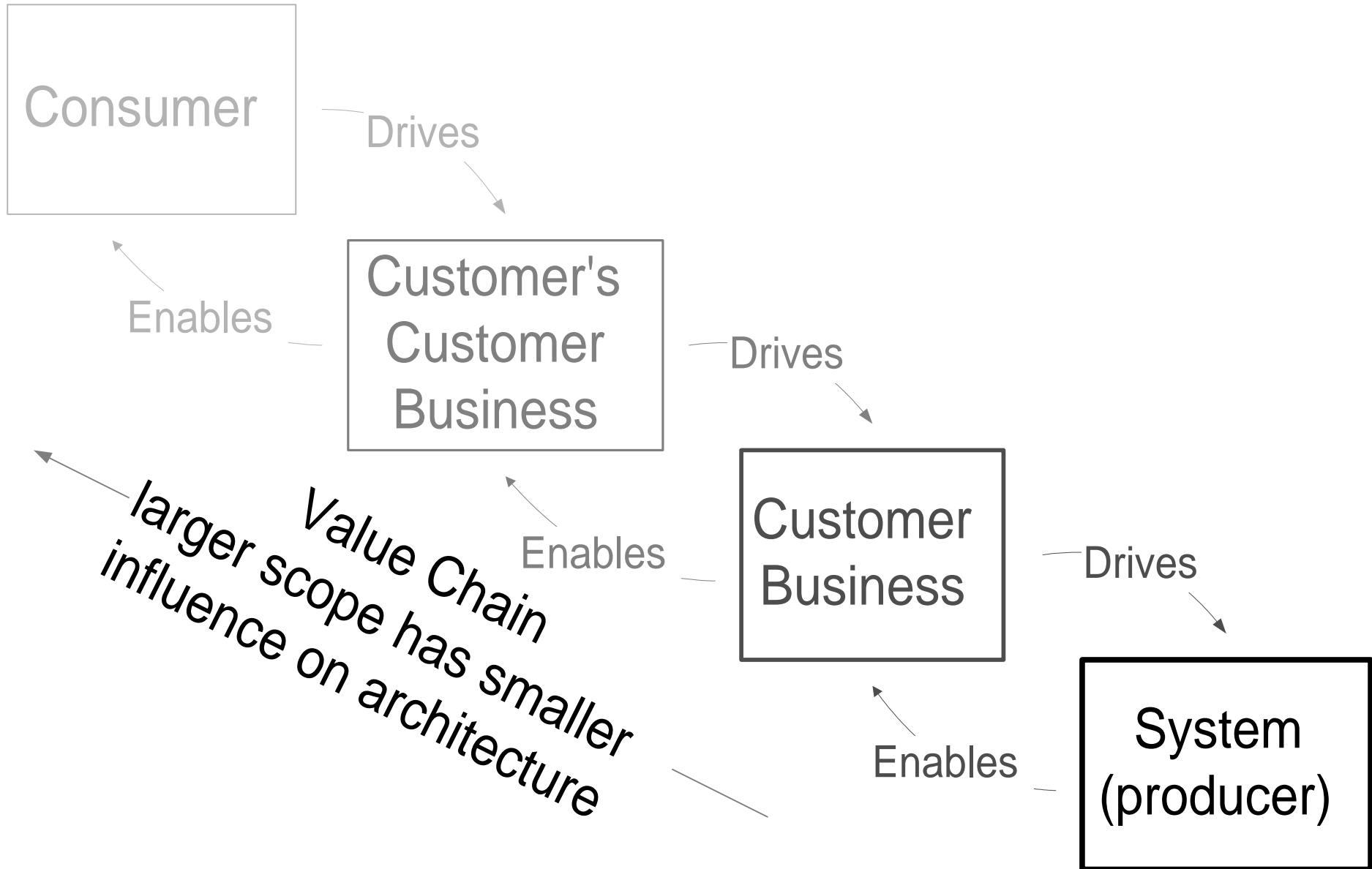
The "CAFCR" model



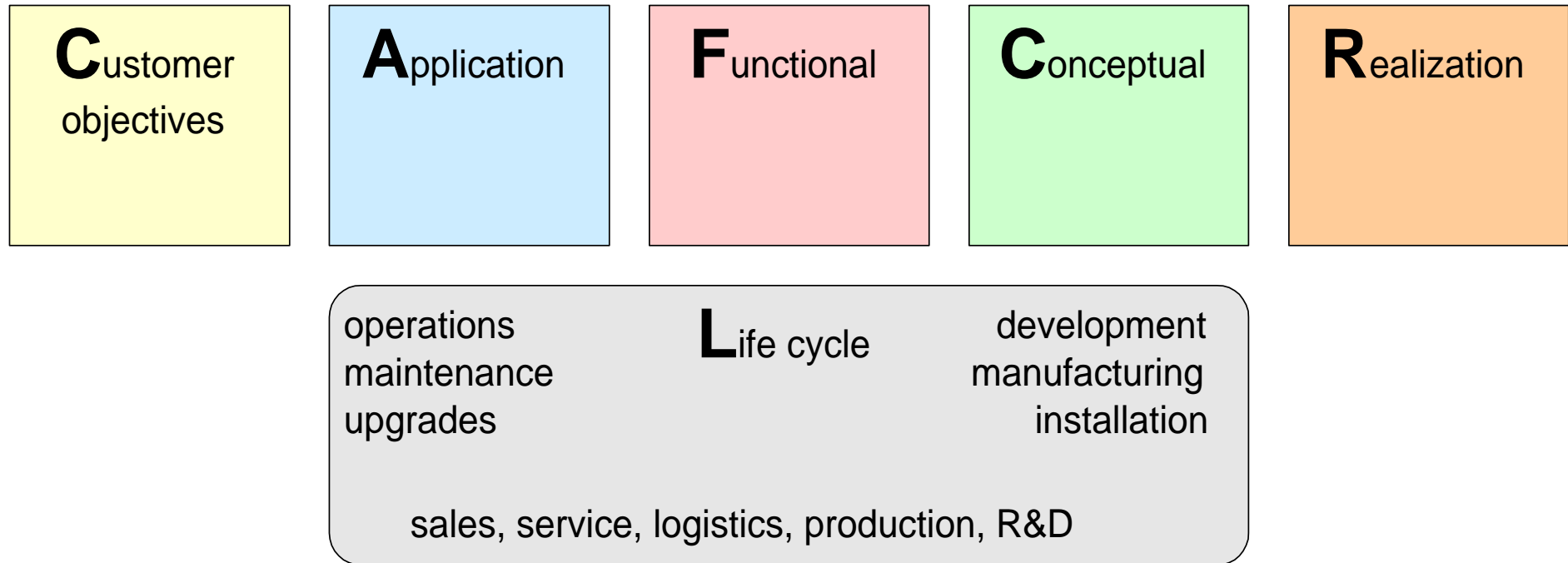
What does Customer need
in Product and **Why?**

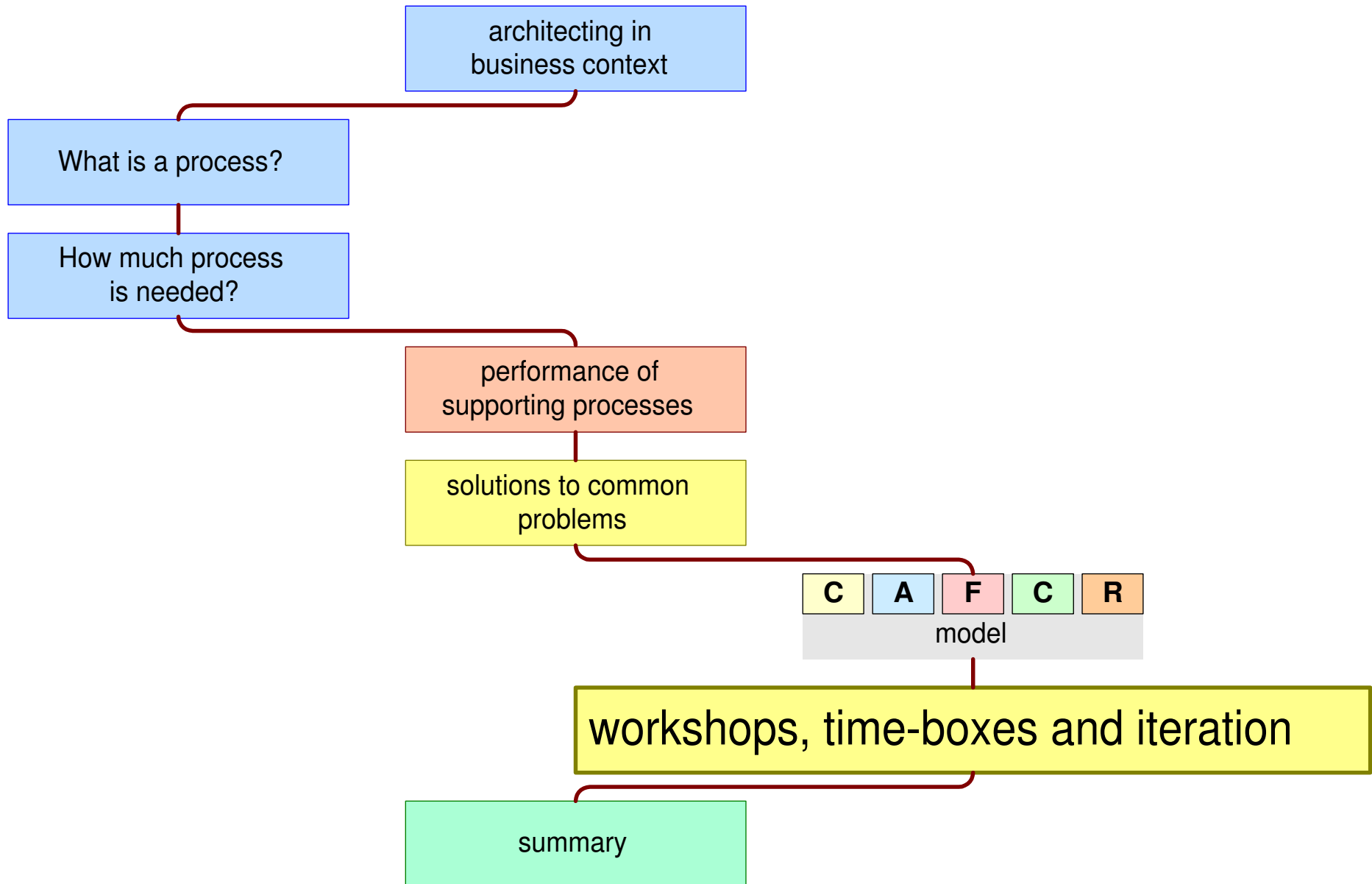


CAFCR can be applied recursively

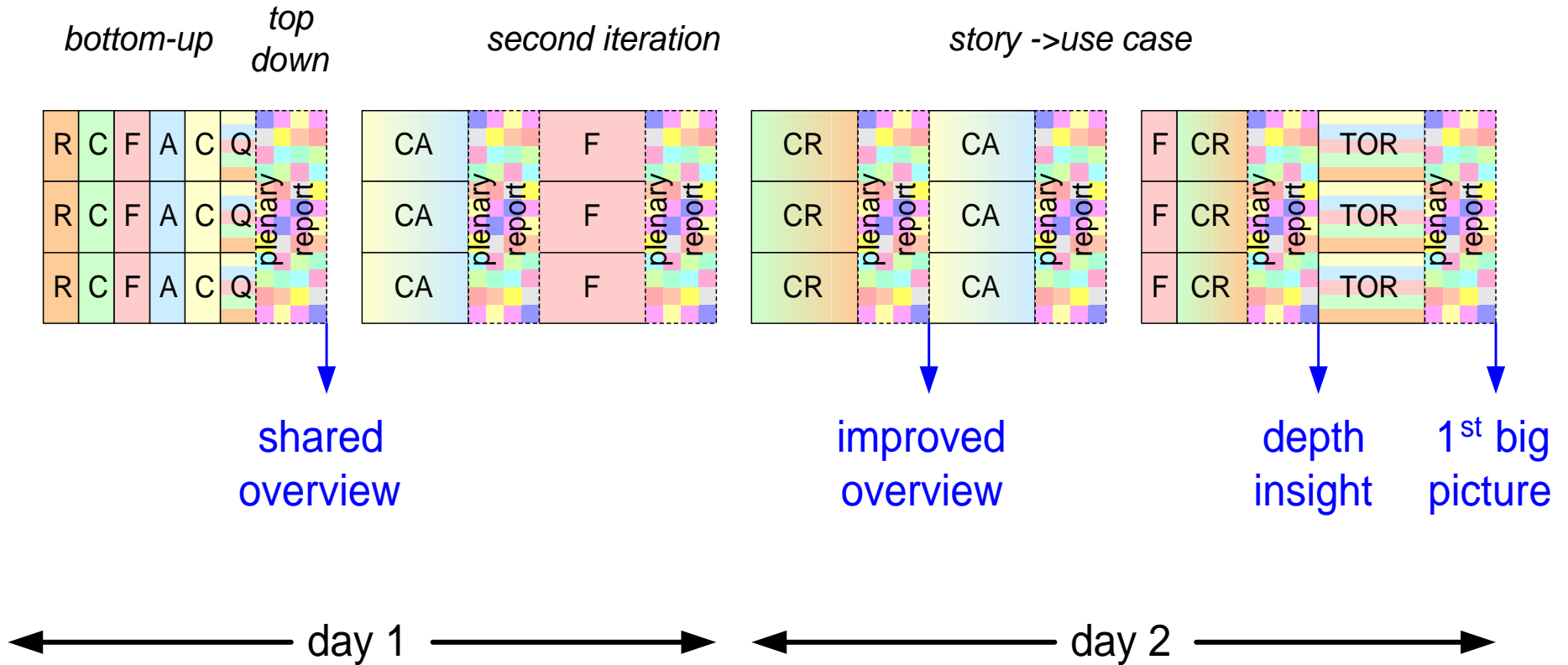


CAFCR+ model; Life Cycle View

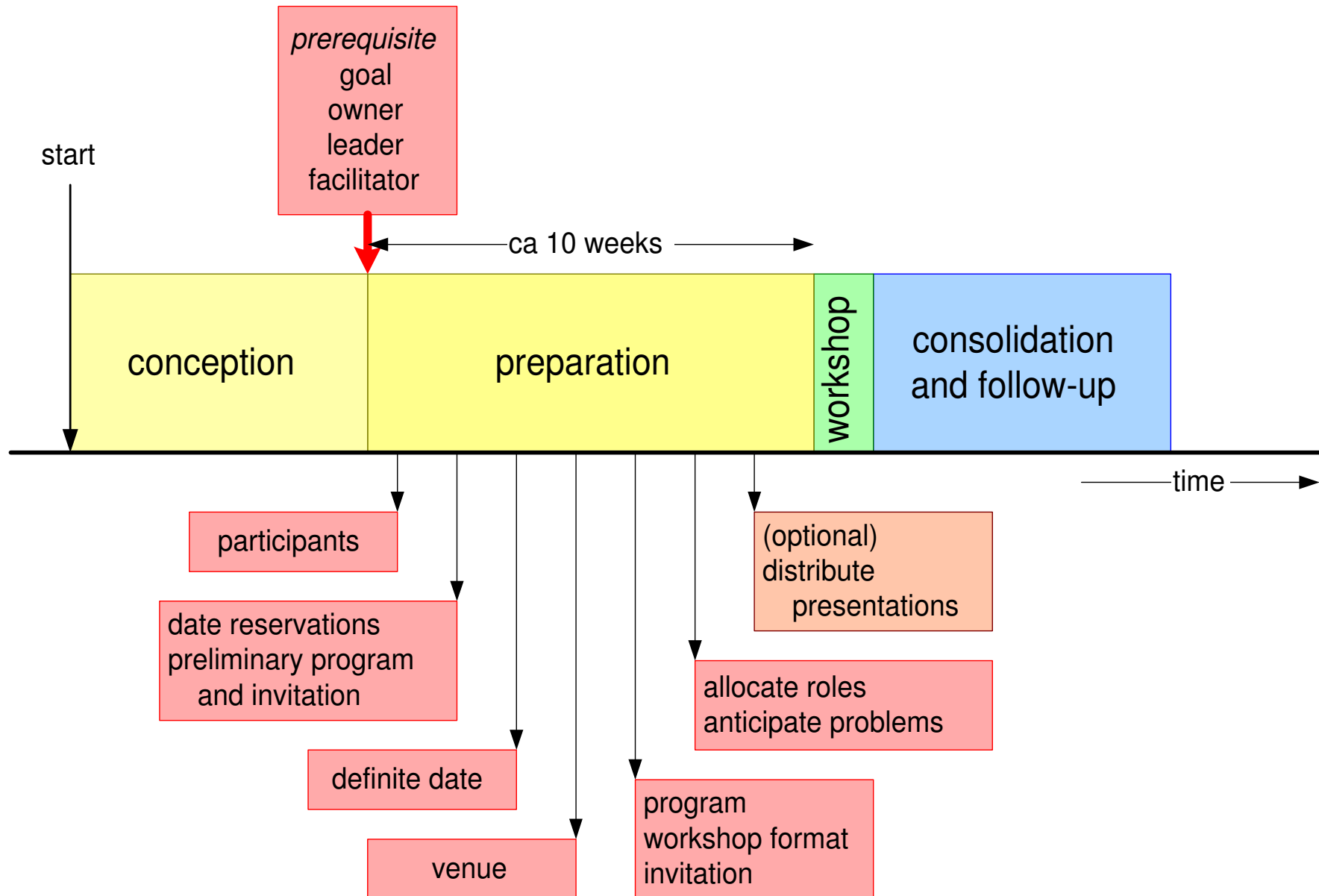




Time-boxes and Iteration



Workshop timeline



Sequence of Workshops

ratio of effort/time

1 : 4 : 1

ca 2 weeks

ca 2 weeks

Problem
understanding

individual
digesting
and
processing

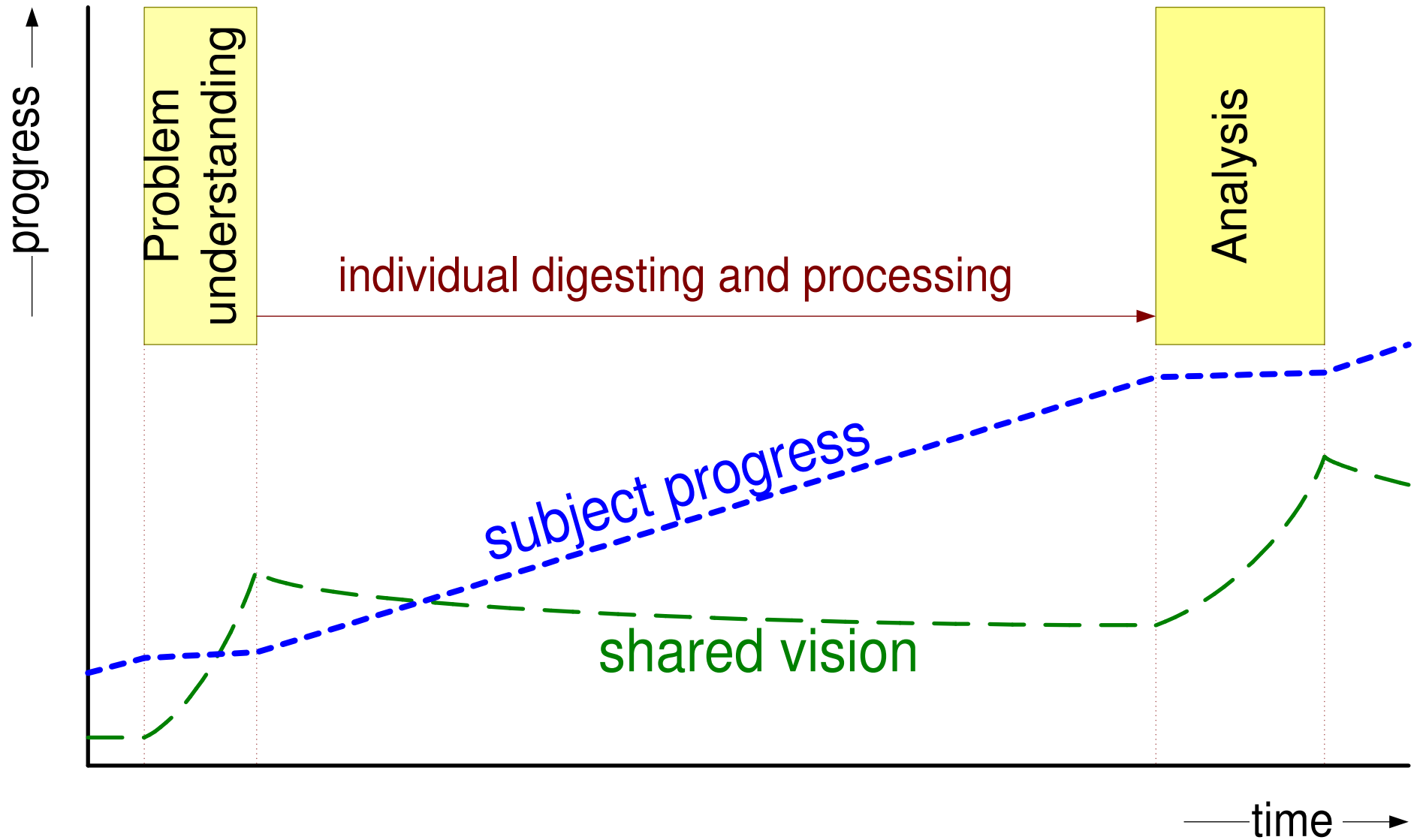
Analysis

individual
digesting
and
processing

Decision

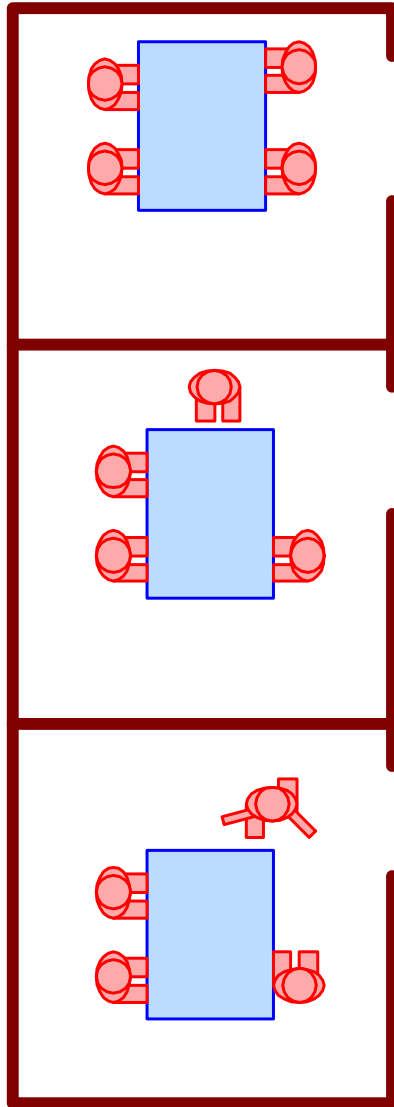
time

Most Subject Progress Outside Workshop

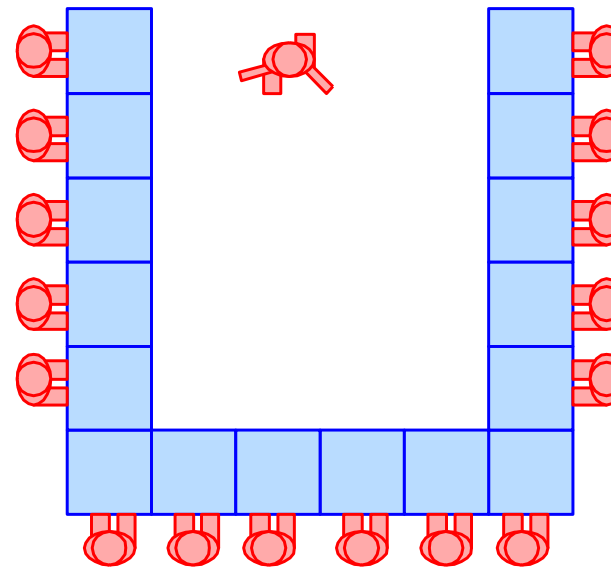


Venue Requirements

break-out rooms



open seating formation
sufficient walking space
ask for a room for $2^* \text{ #participants}$



plenary area

Secret Workshop Success Factors

active

>70% of the time active
short intro, short broadcasts

focused

clear scope and goal
format

well-prepared

timely invitation
seed presentations
seed questions

involved participants

full-time present
no cellphone
no e-mail

Summary

