

Exploration of the bloating of software

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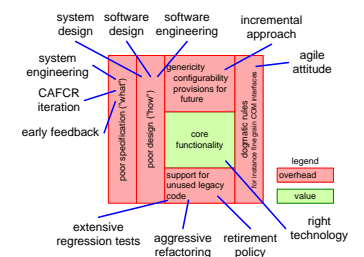
Abstract

Present-day products contain one order of magnitude more software code than is actually needed. The causes of this bloating are explored. If we are able to reduce the bloating significantly, then the product creation process is simplified tremendously. Potential handles to attack the bloating are discussed.

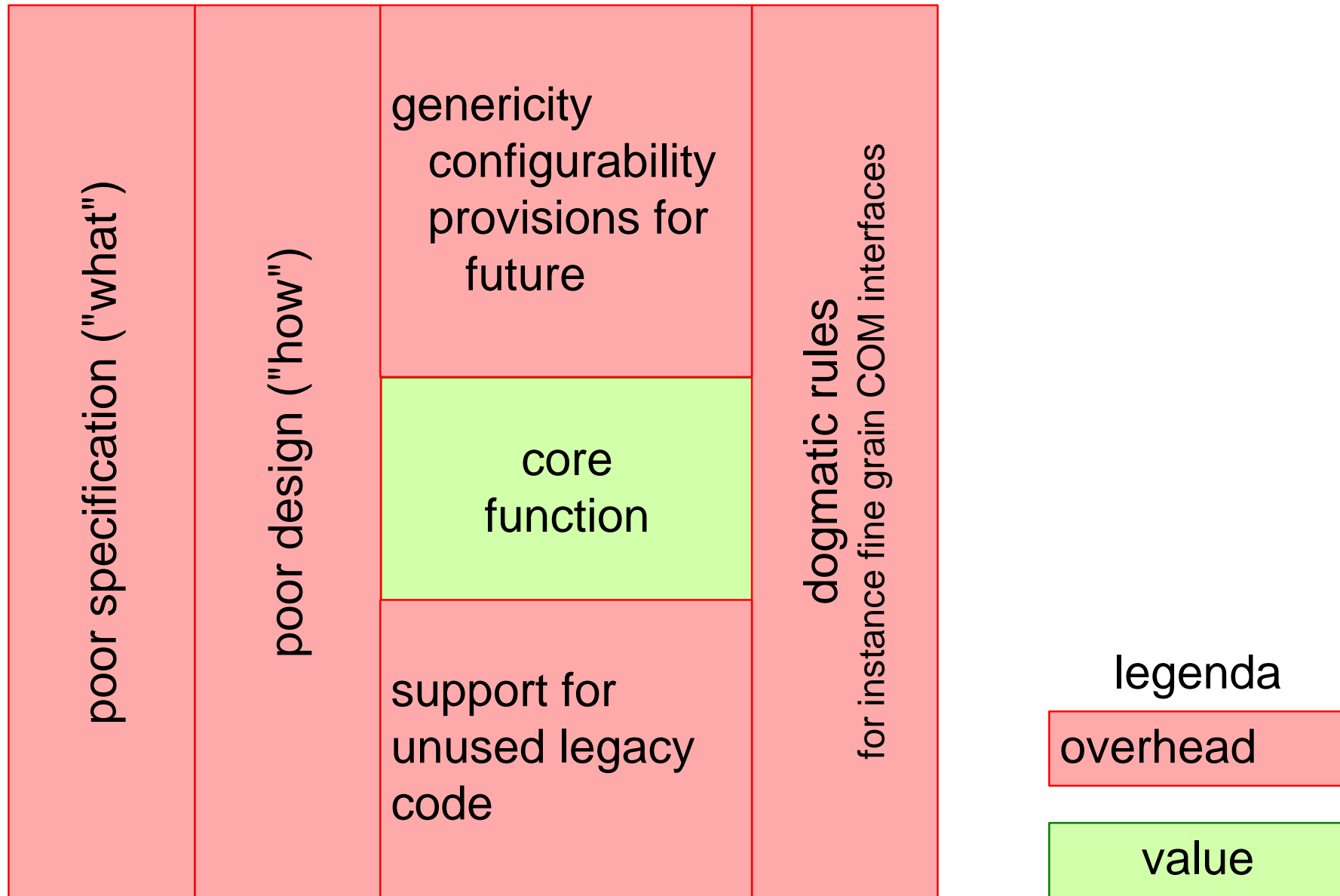
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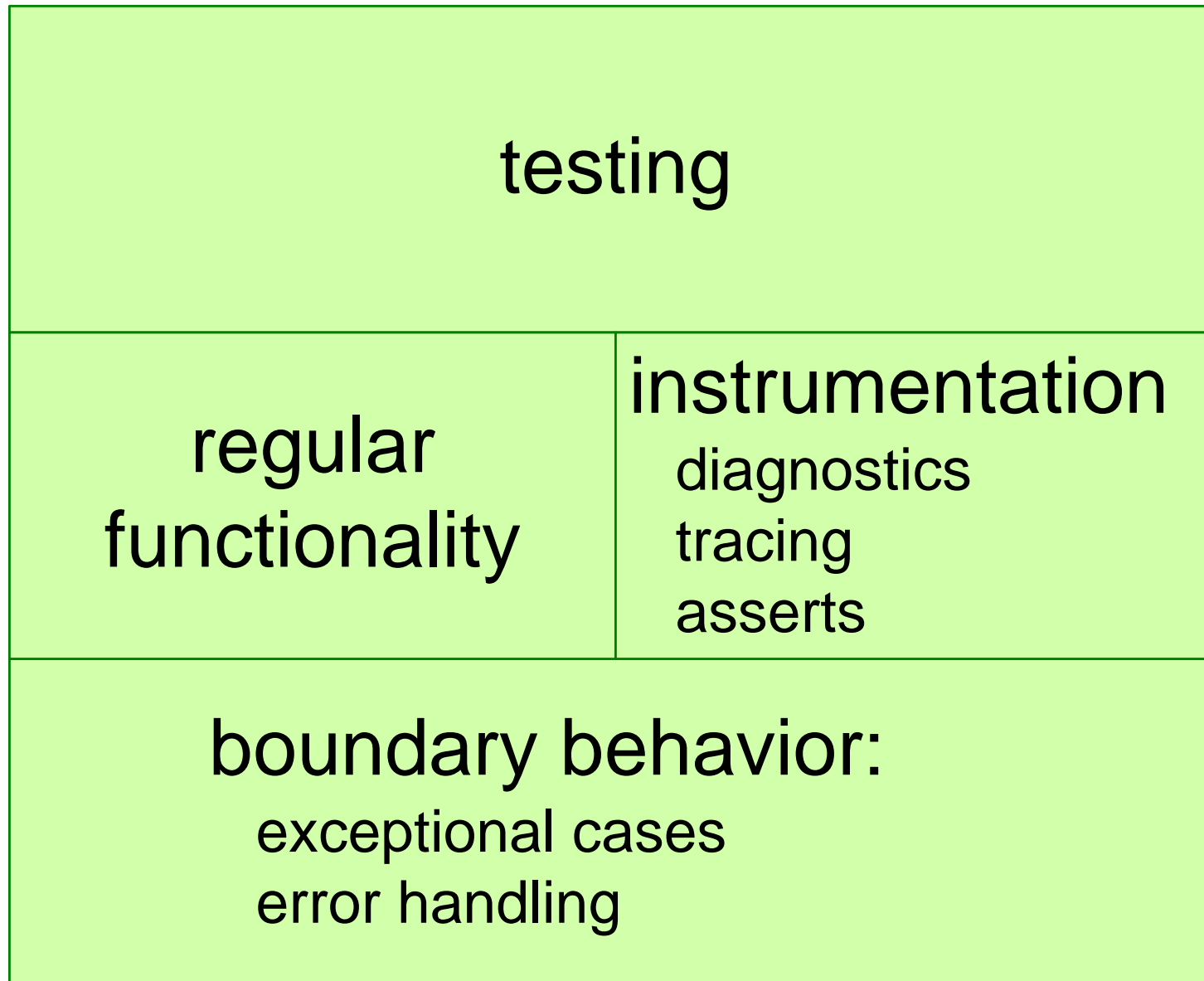
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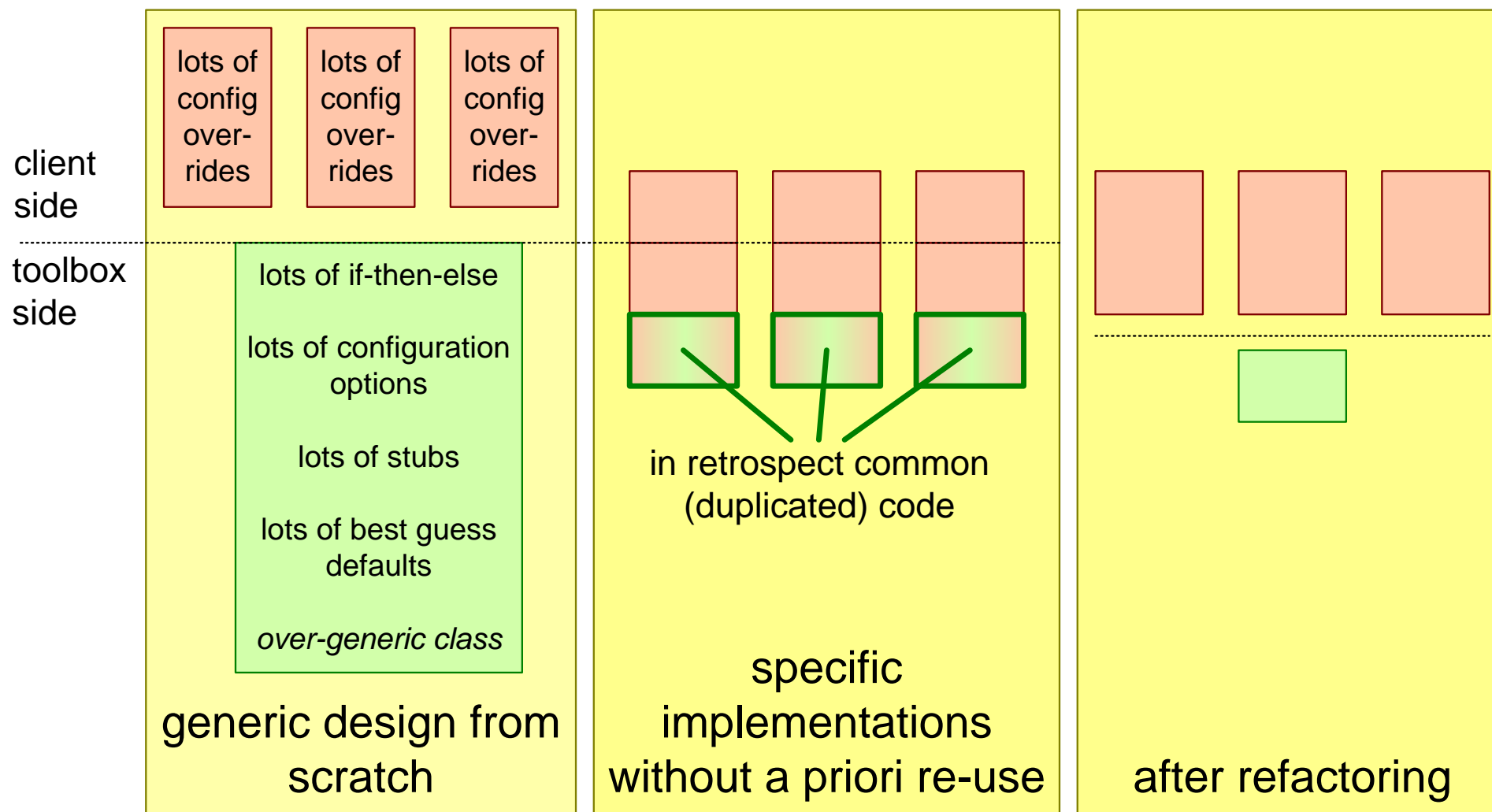
Exploring bloating: main causes



Necessary functionality \gg the intended regular function

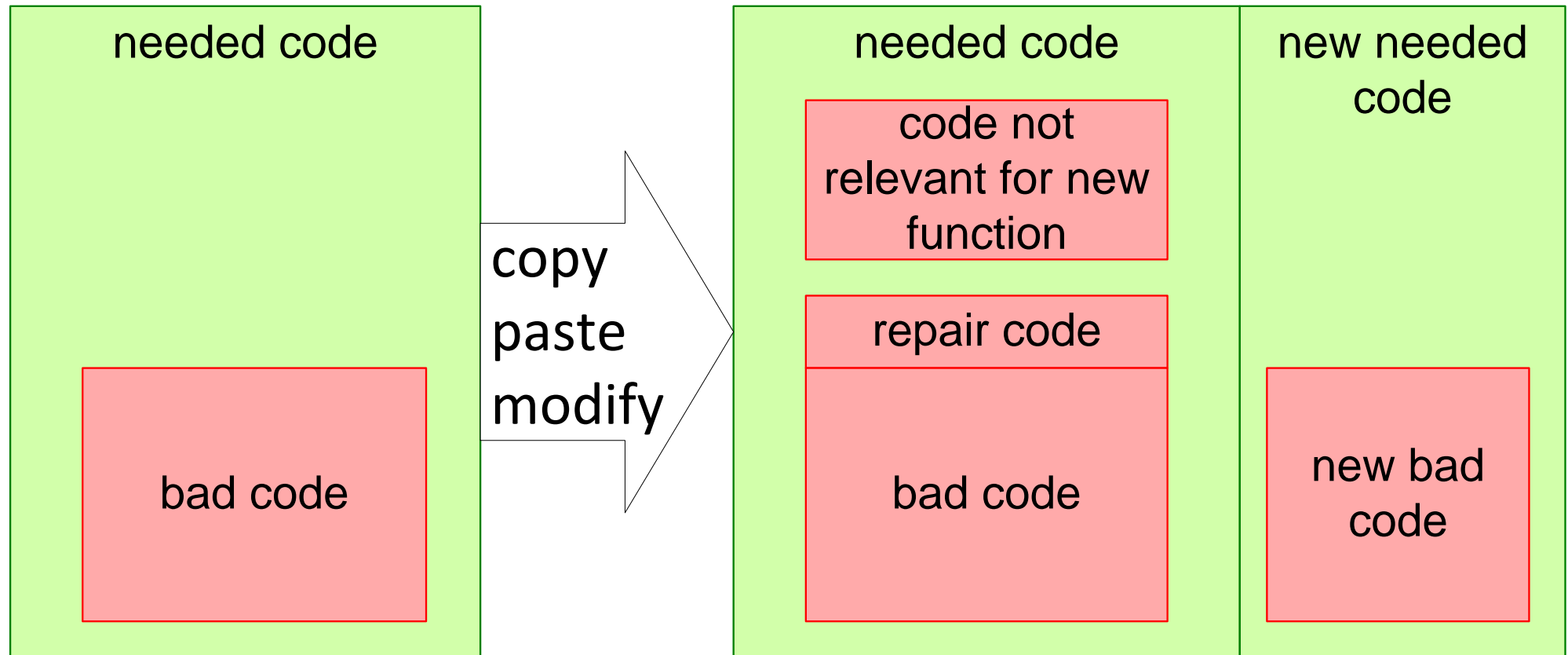


The danger of being generic: bloating

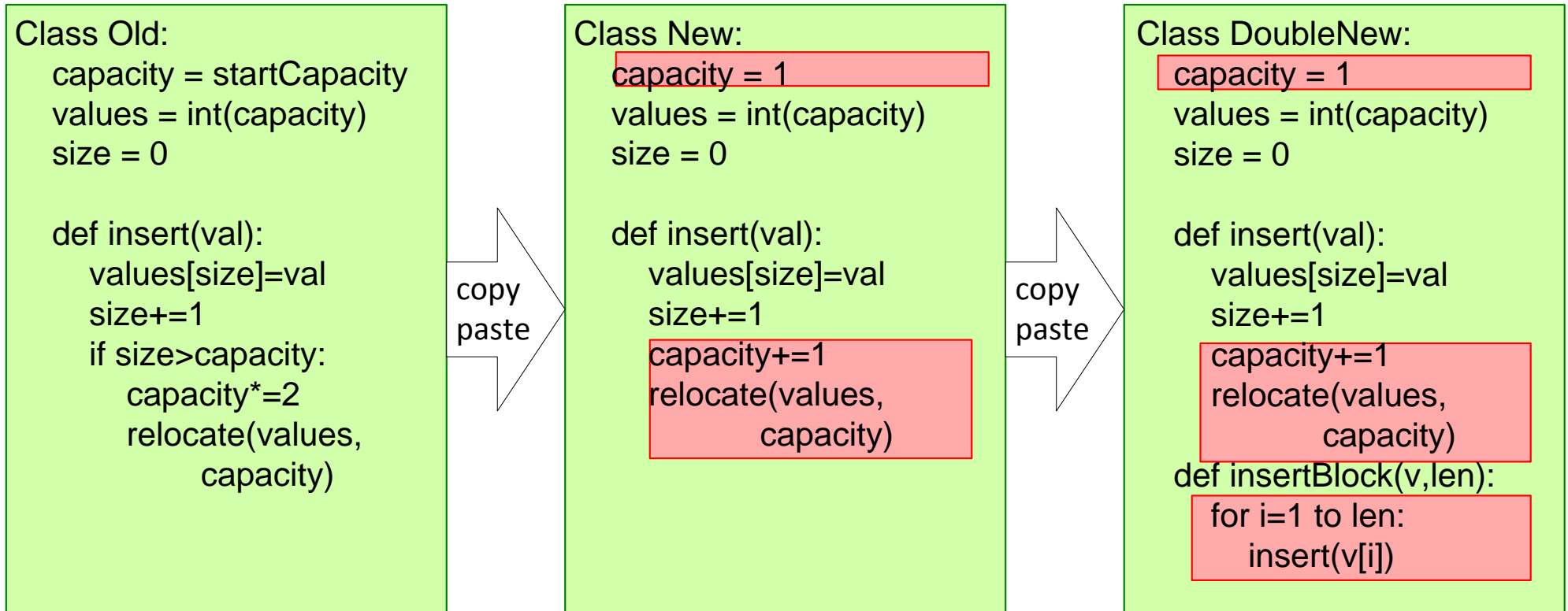


"Real-life" example: redesigned *Tool* super-class and descendants, ca 1994

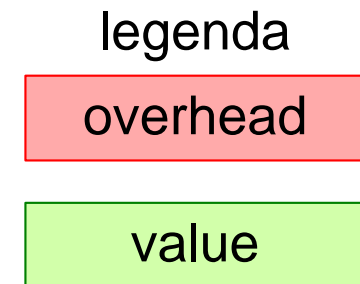
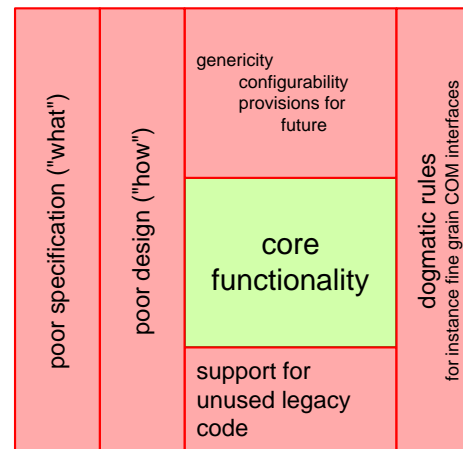
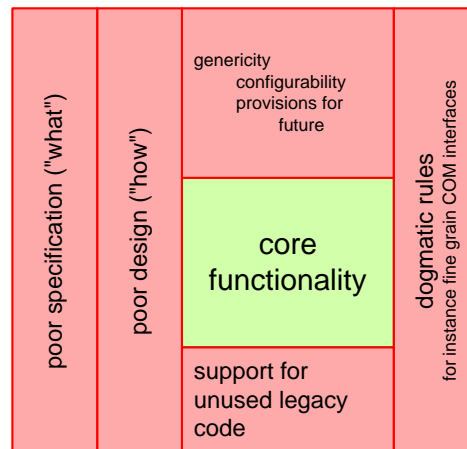
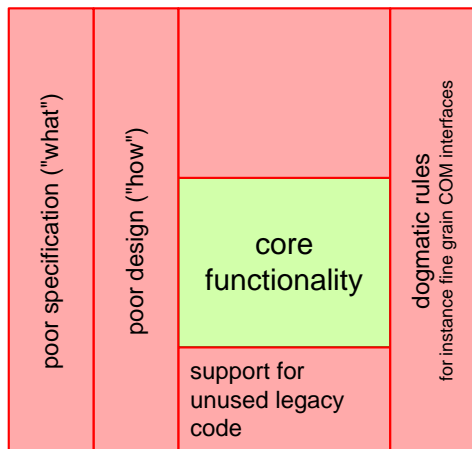
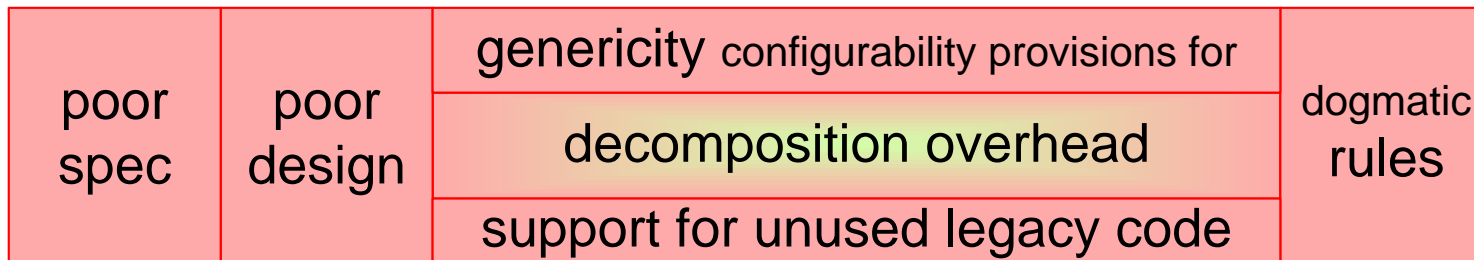
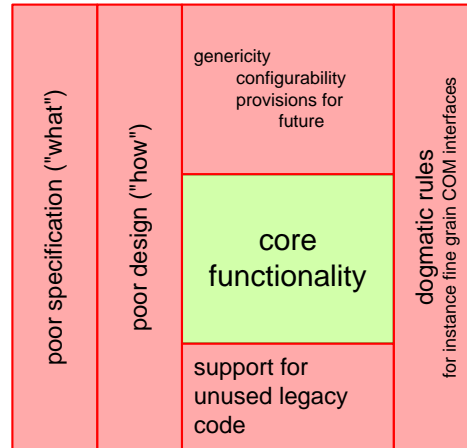
Shit propagation via copy paste



Example of shit propagation

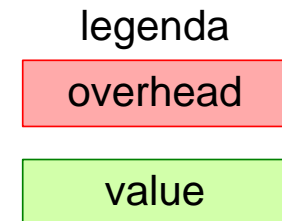
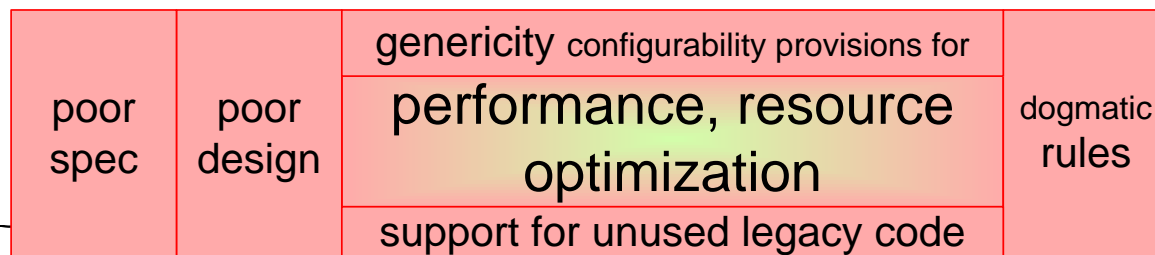
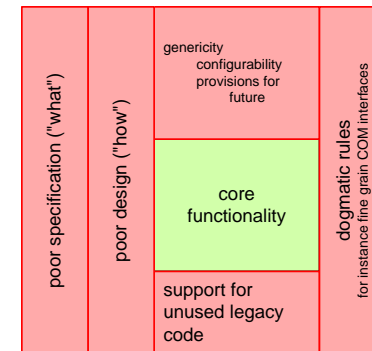
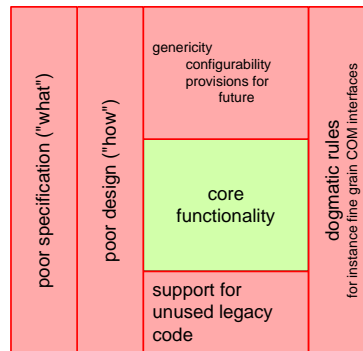
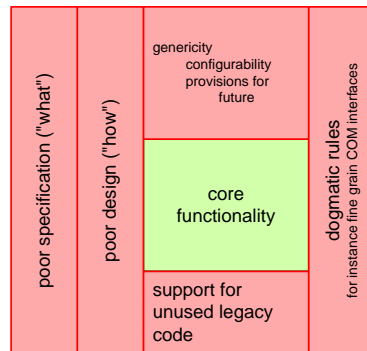
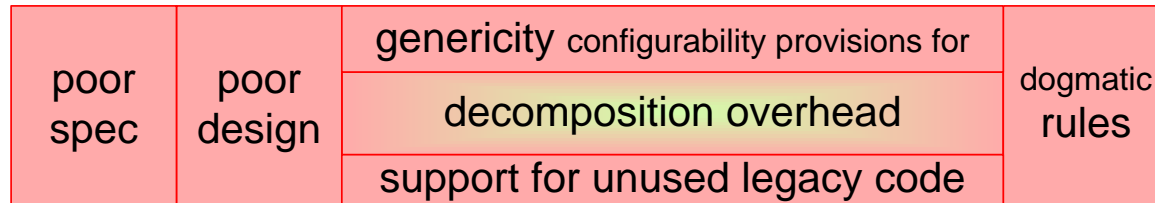
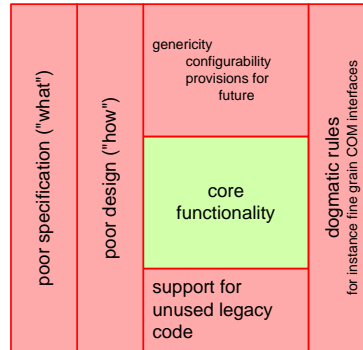


Bloating causes more bloating



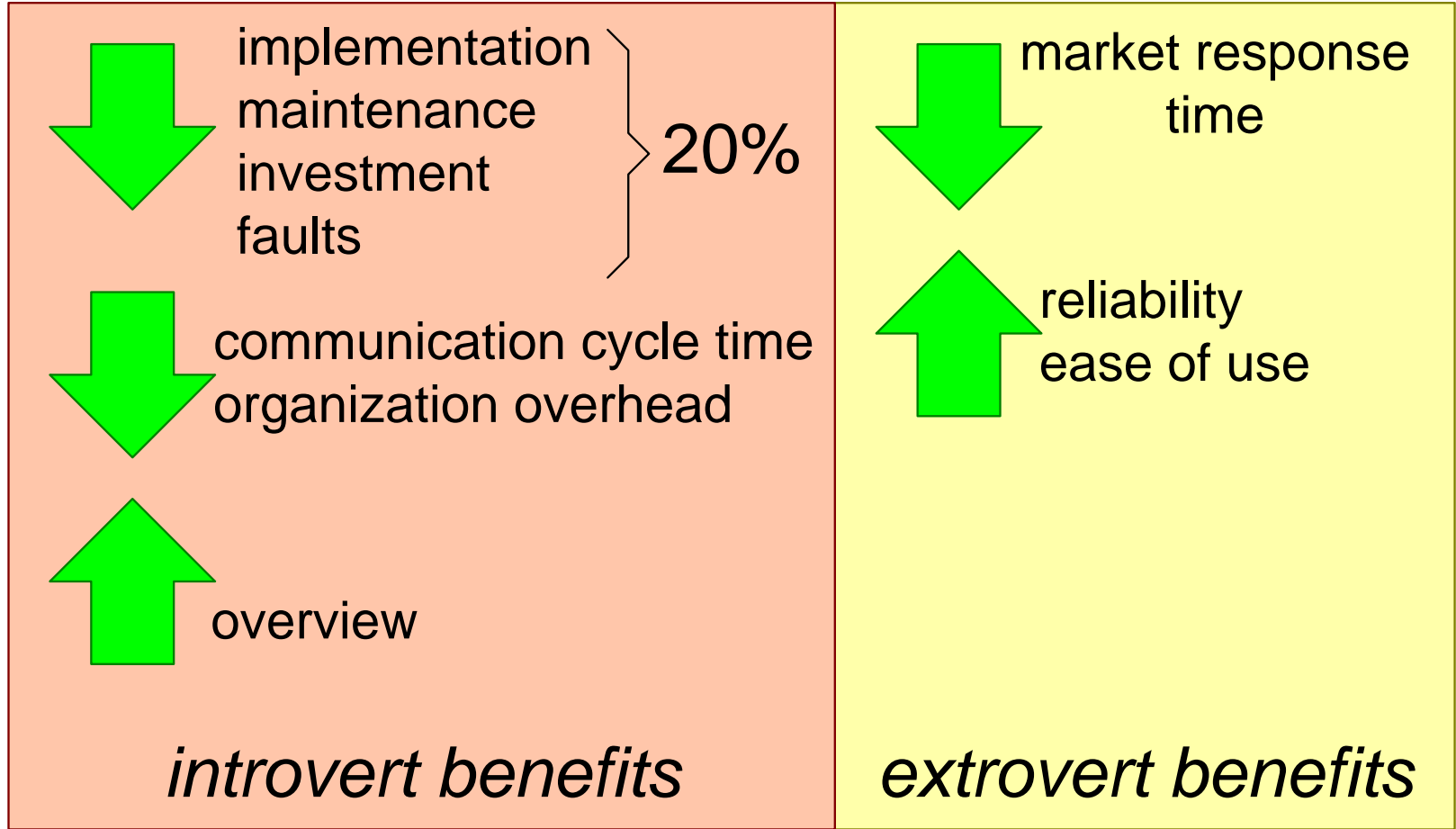
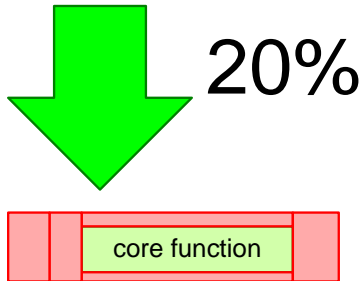
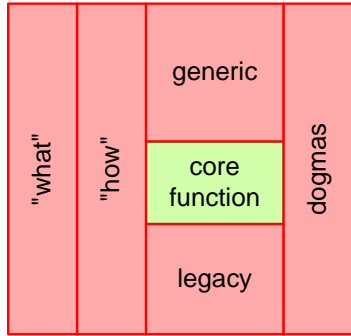
Causes even more bloating...

Bloating causes performance and resource problems.
Solution: special measures: memory pools, shortcuts, ...

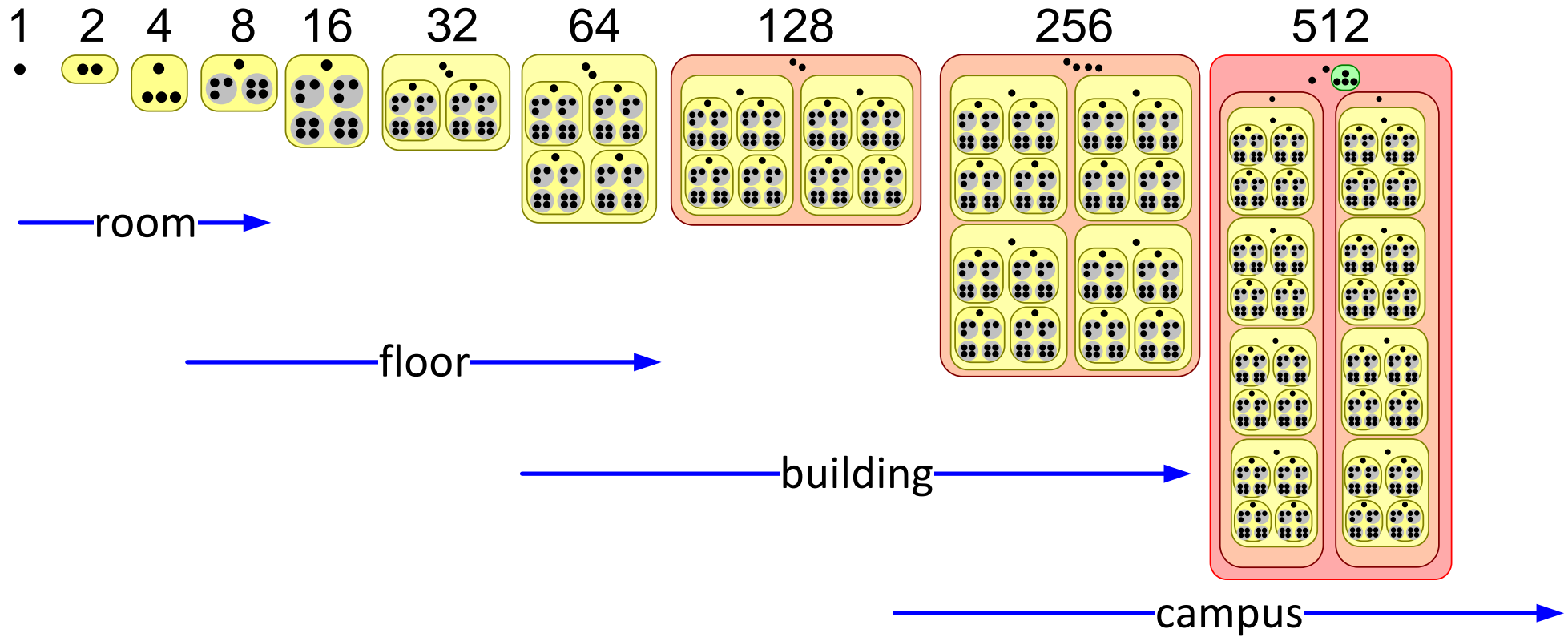


What if we remove half of the bloating?

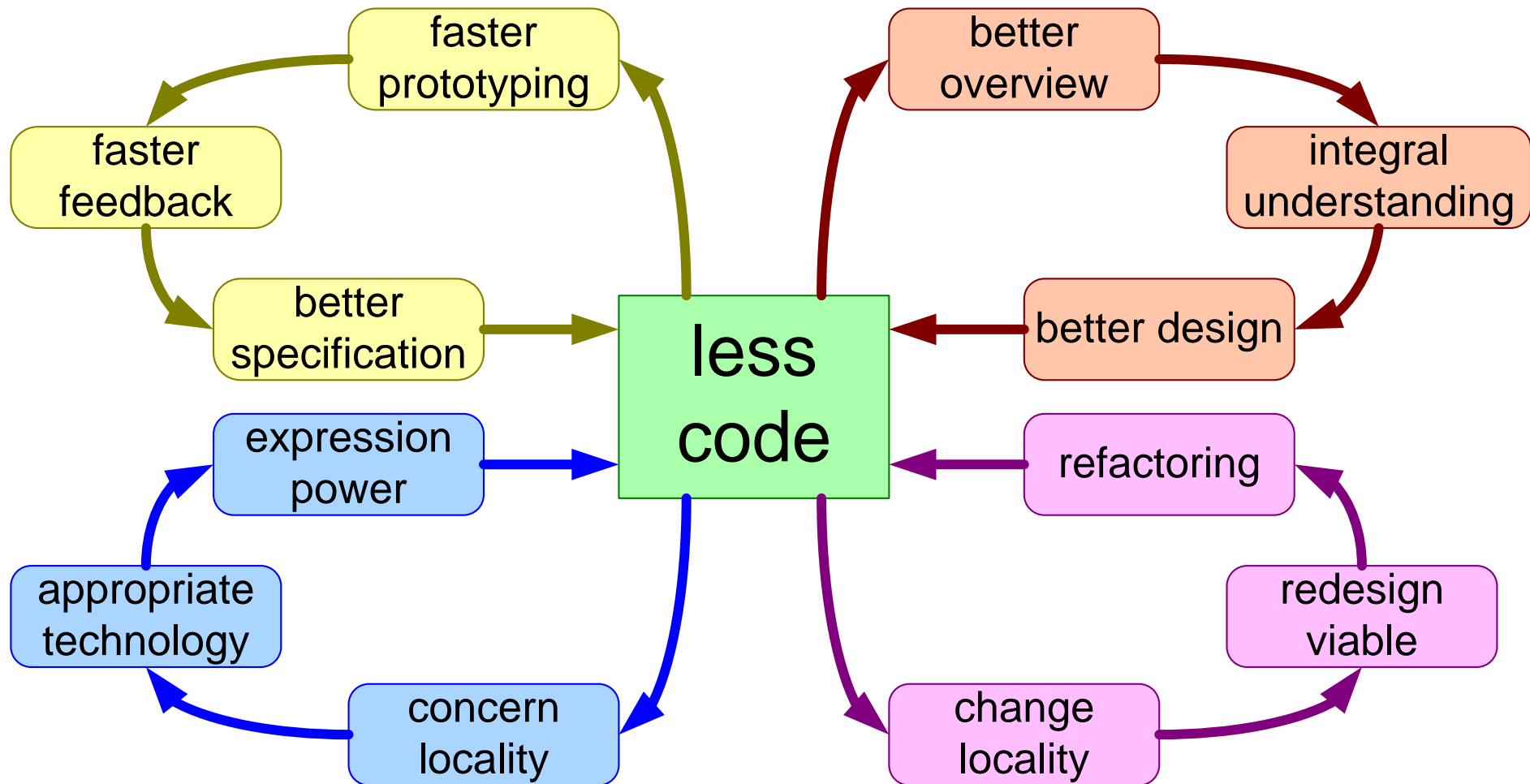
code size
reduced with
factor 5



Impact of size on organization, location, process

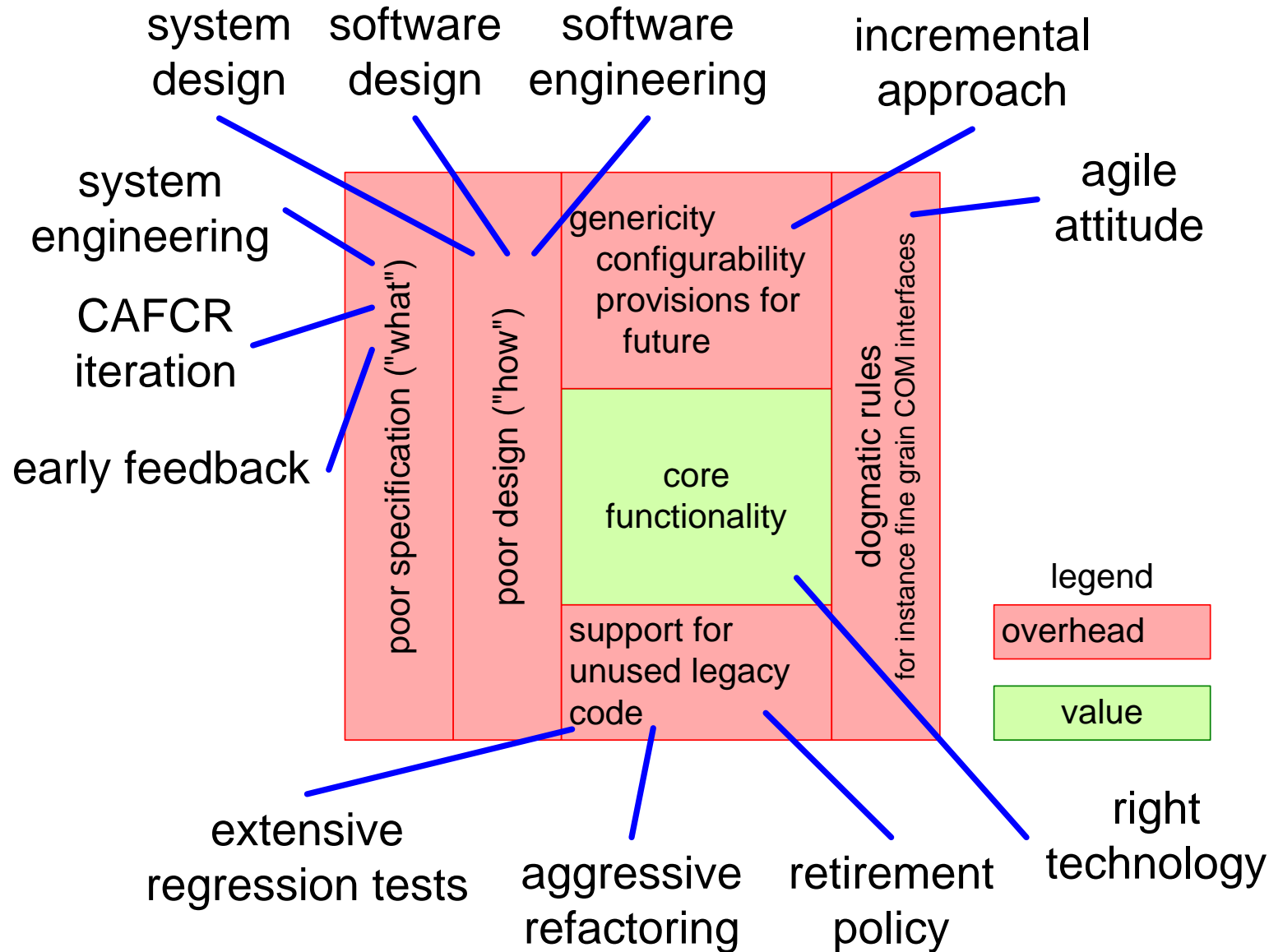


Anti bloating multiplier



same type of diagram can be made for **less people**
(less communication, space, organization, bureaucracy)

How to reduce bloating

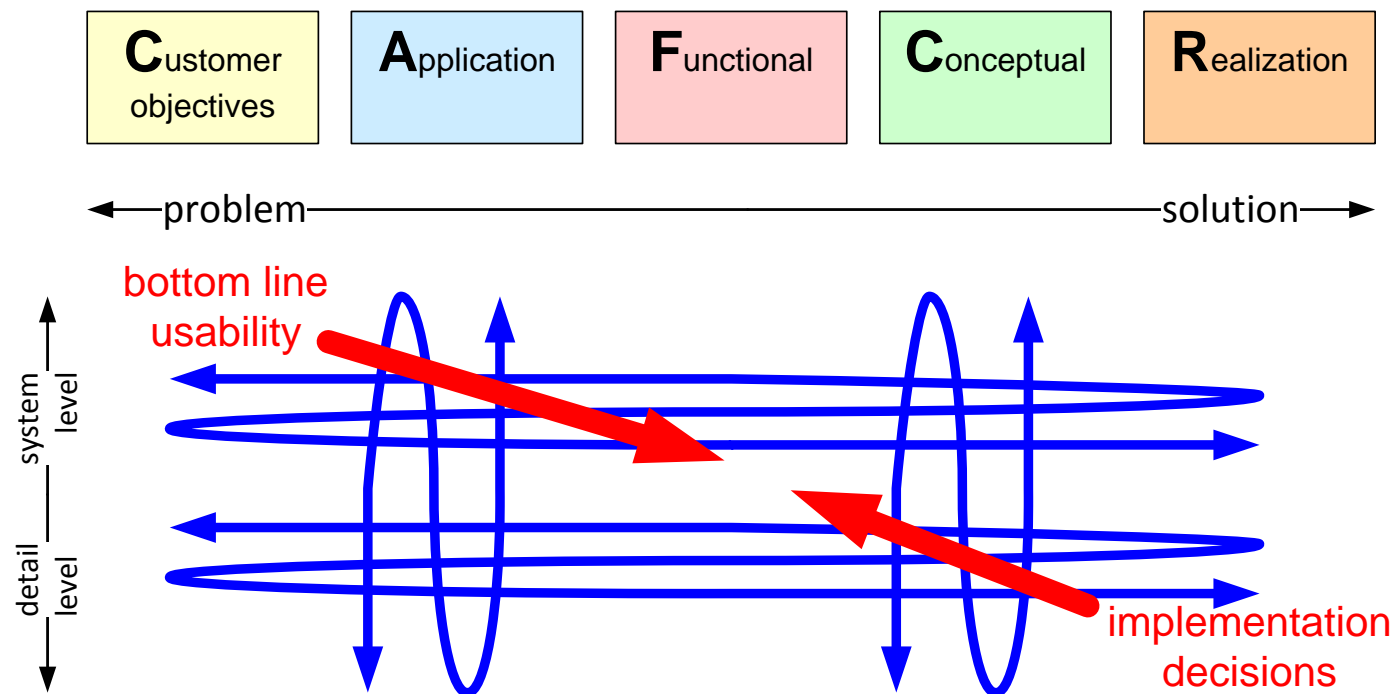


Improving the specification

poor specification ("what")

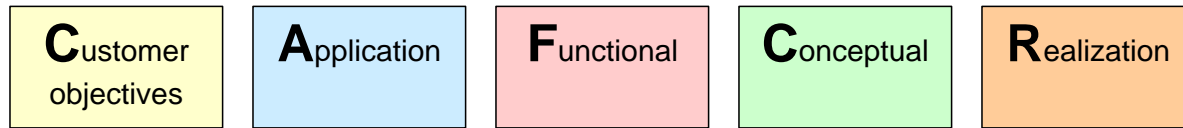
system engineering: mature discipline, checklists, literature

CAFCR iteration, early **feedback**: learn **why**

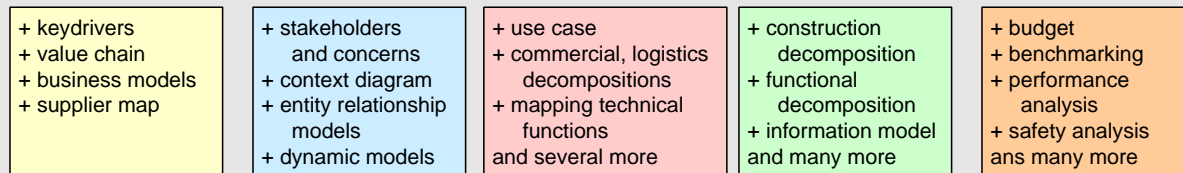


Improve design: use multiple views and methods

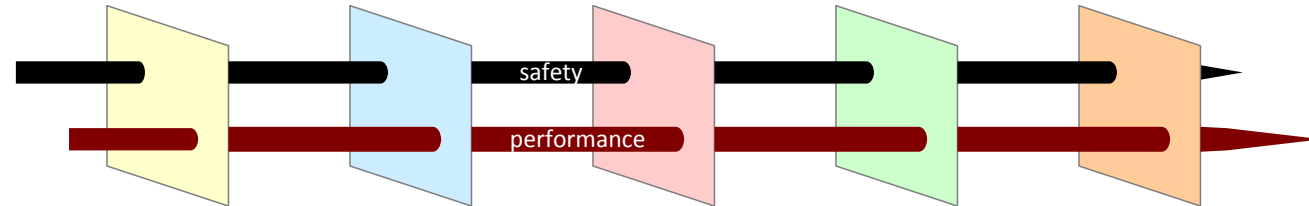
architecture decomposition



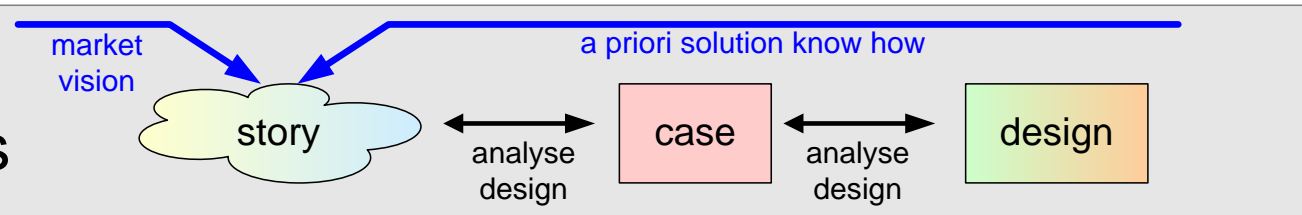
submethods per view



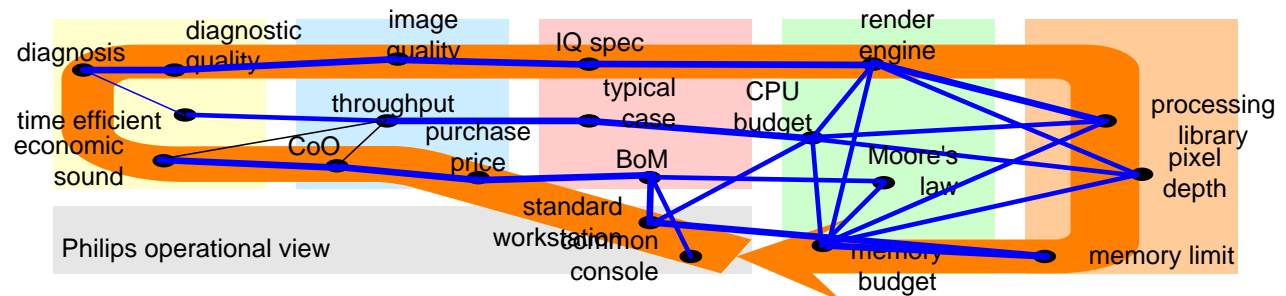
integration via qualities



explore specific details



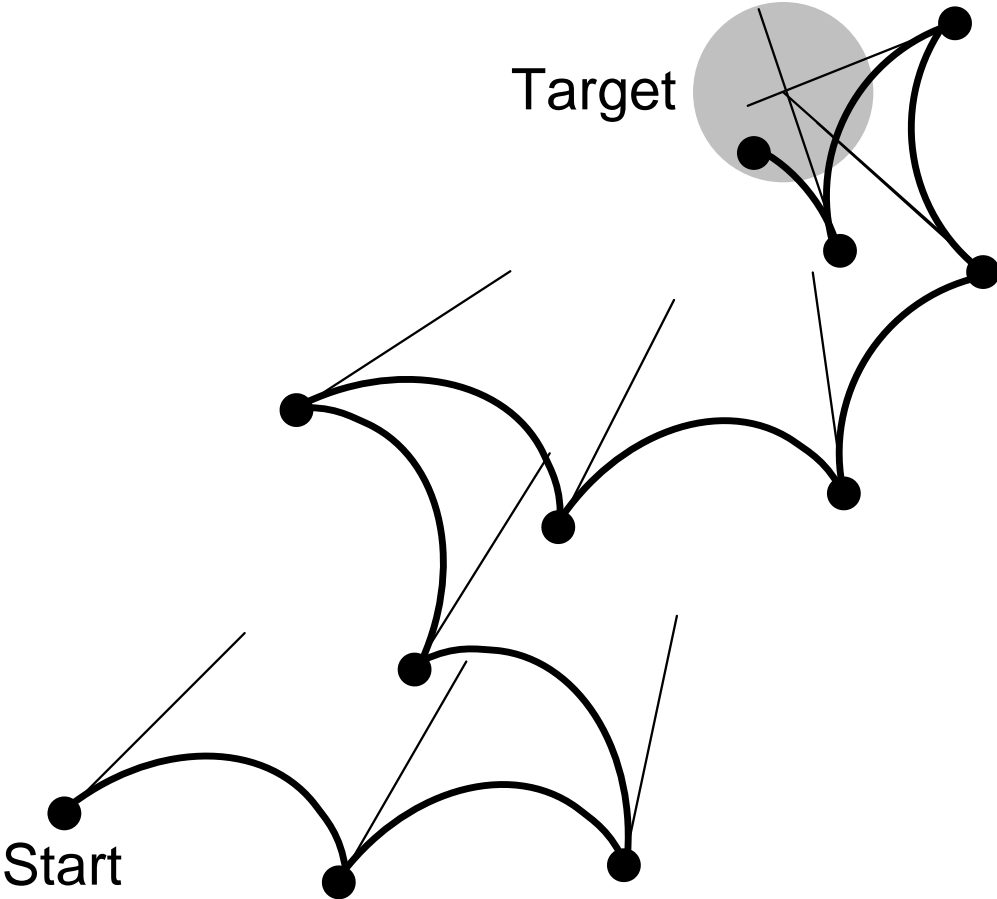
reasoning



See: Architectural Reasoning <http://www.extra.research.philips.com/natlab/sysarch/ArchitecturalReasoning.html>

Feedback

stepsize: 3 months
elapsed time: 25 months

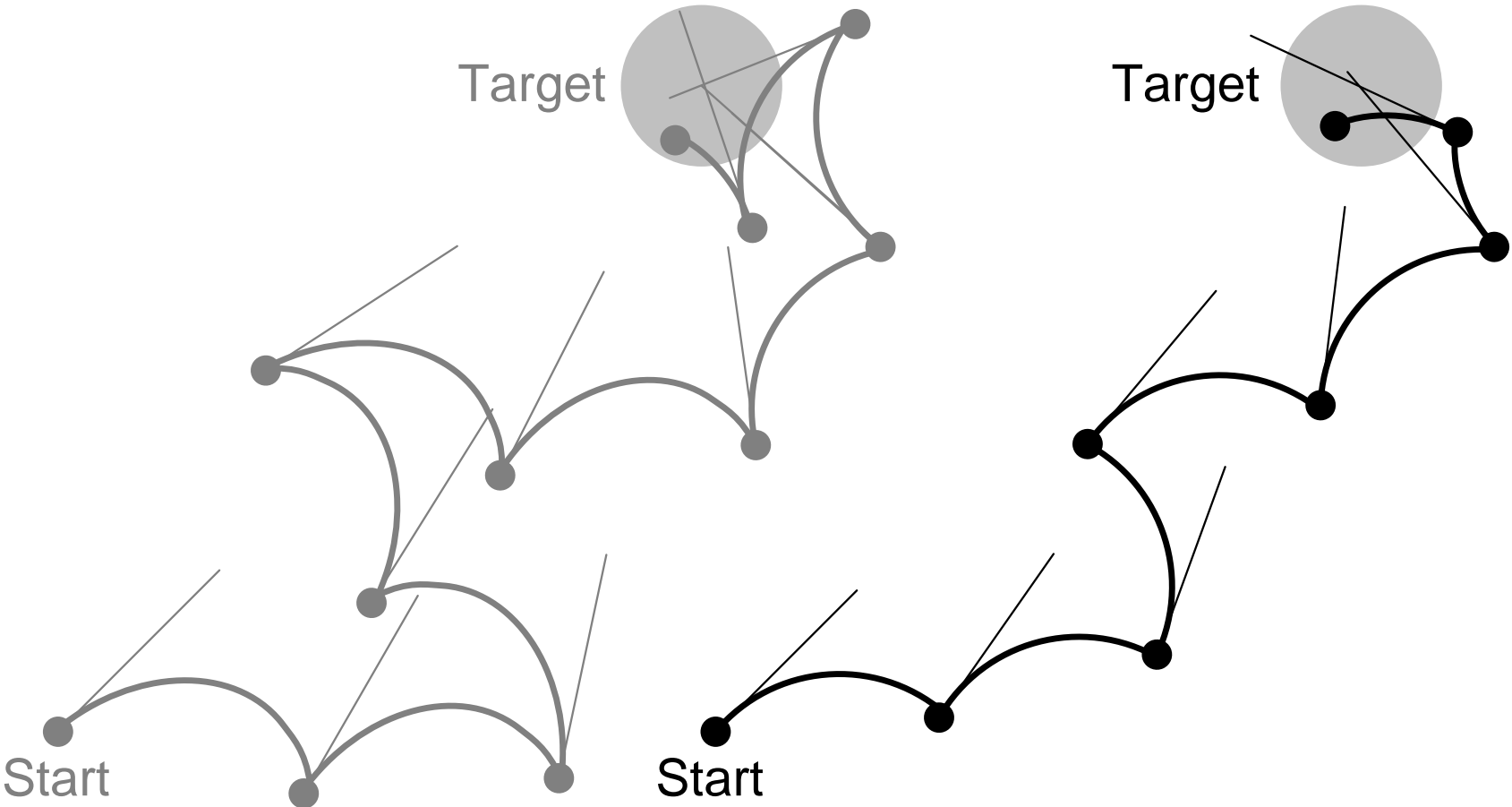


Feedback (2)

stepsize:
elapsed time

3 months
25 months

2 months
12 months



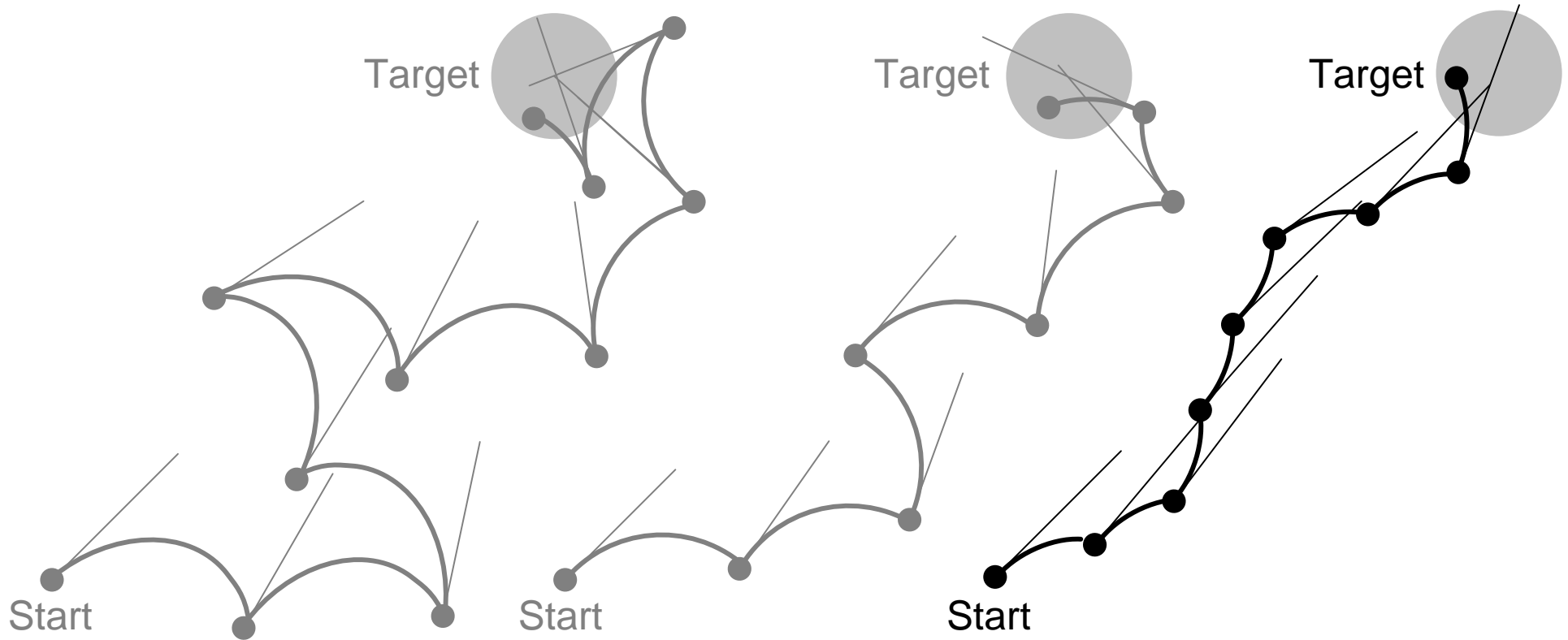
Feedback (3)

stepsize:
elapsed time

3 months
25 months

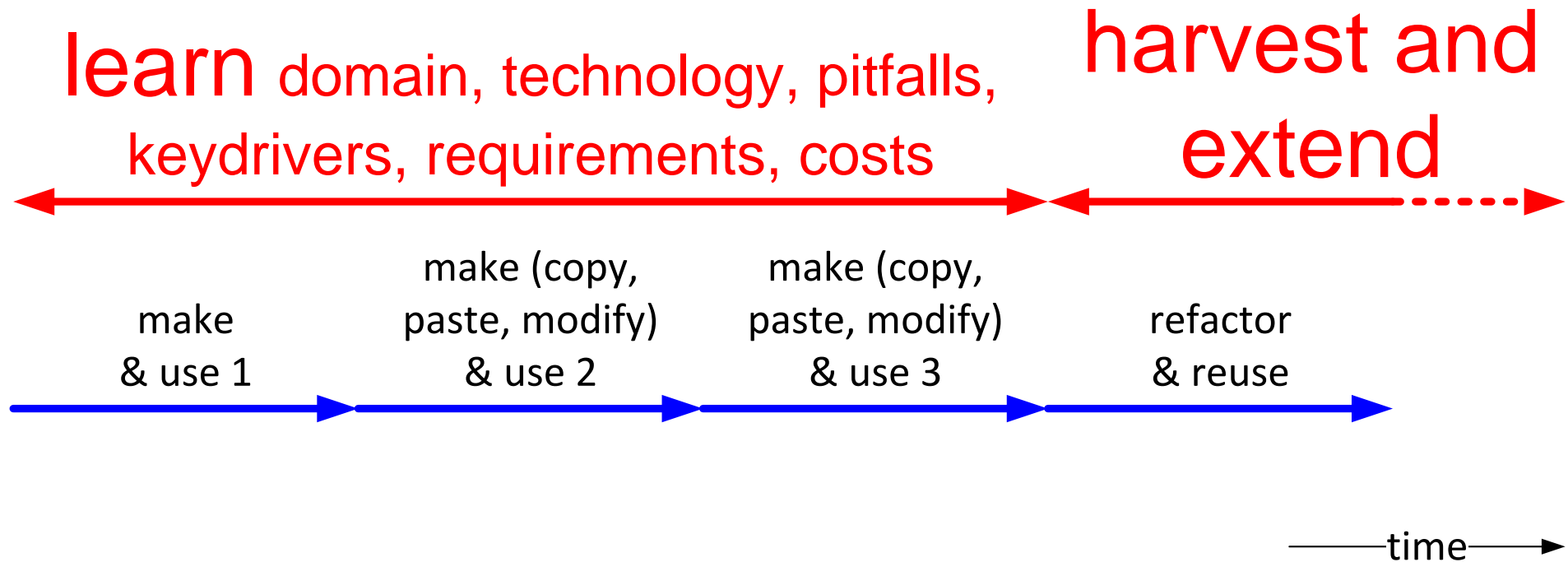
2 months
12 months

1 month
8 months



Small feedback cycles result in Faster Time to Market

Lesson learned about reuse



heuristic: use 3 times before factoring out the generic parts

Examples of "right" technology choices

UI prototyping:

GUI editor/generator

non hard real time textual, algorithmic, networking:



Python

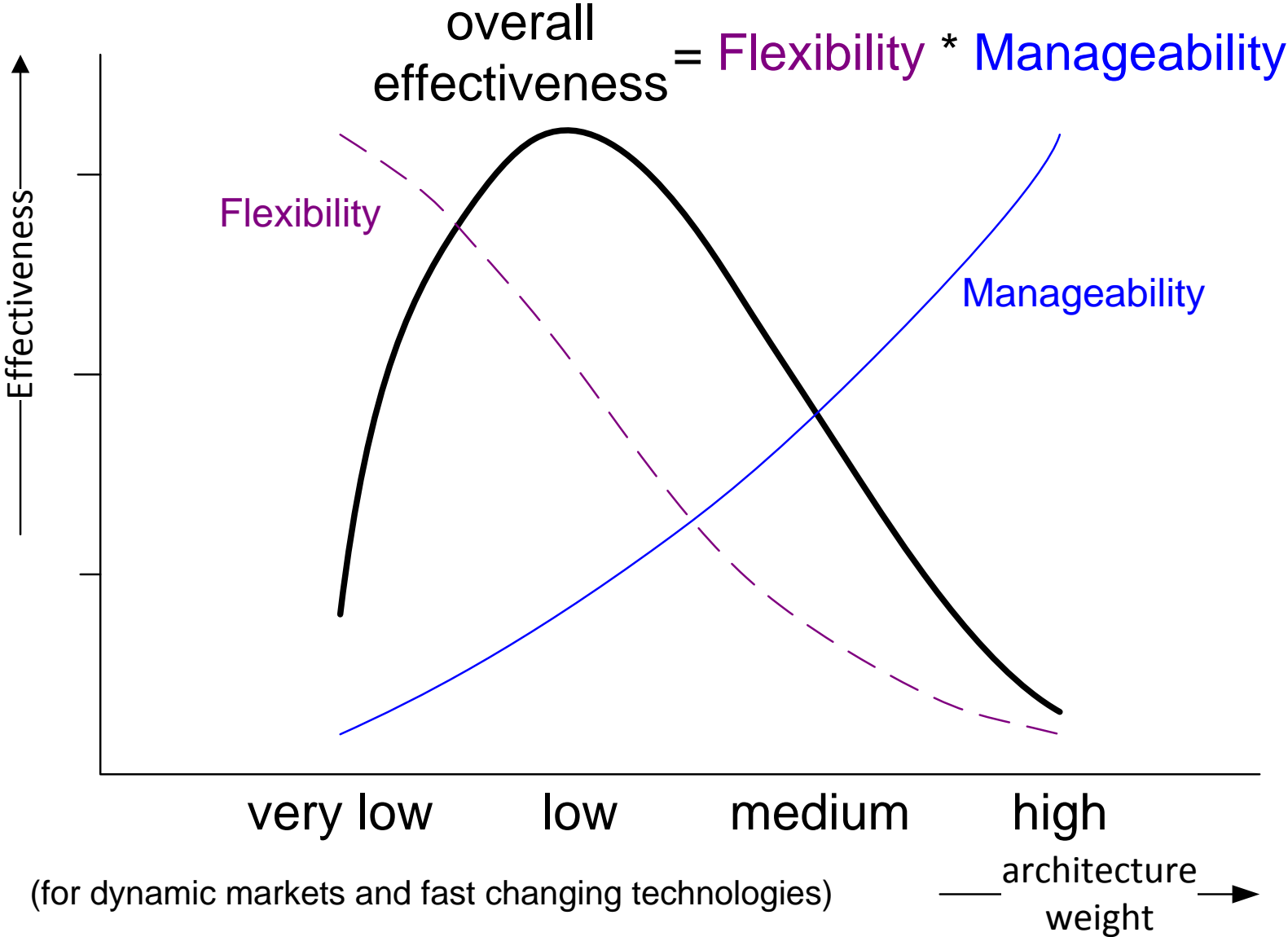
small hard real-time or extremely performance critical

hand optimized

highly repeatable problem

dedicated generator tools

Keep the architecture weight low



support for unused legacy code

retirement policy

make explicit what can
not be used anymore

aggressive refactoring

cleanup

extensive regression tests

reduce fear
reduce surprises