

# Execution Architecture Soft Real Time design

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## Abstract

### Distribution

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September 1, 2020

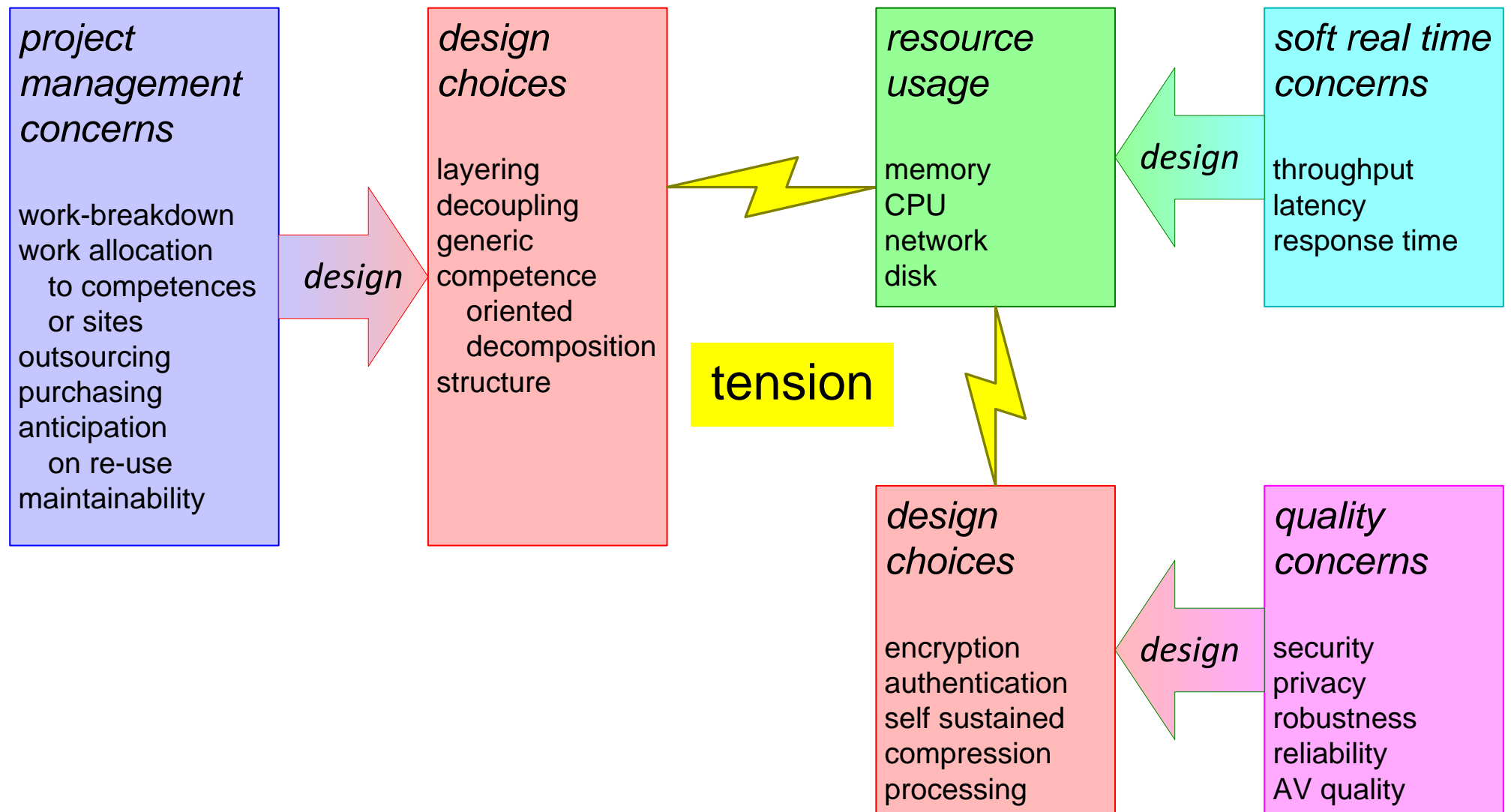
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logo

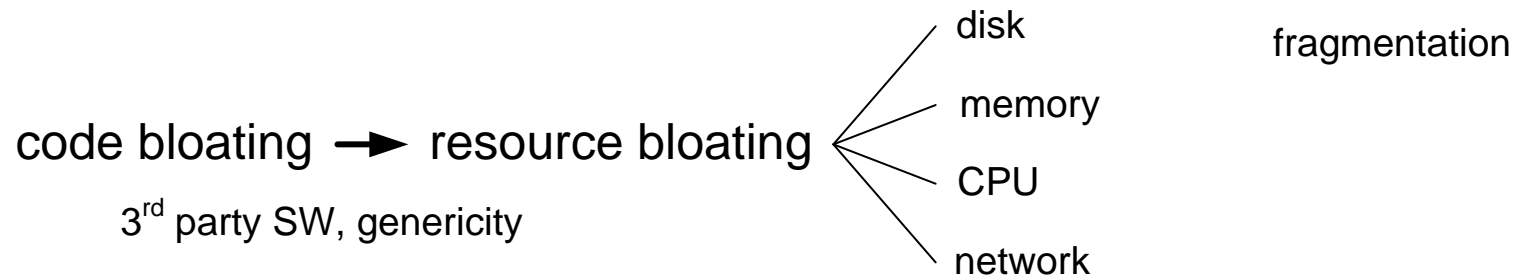
TBD

# Tension between different types of concerns



# Root causes of soft real time problems

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abundant layering or decomposition

too fine granularity eg bitwise I/O

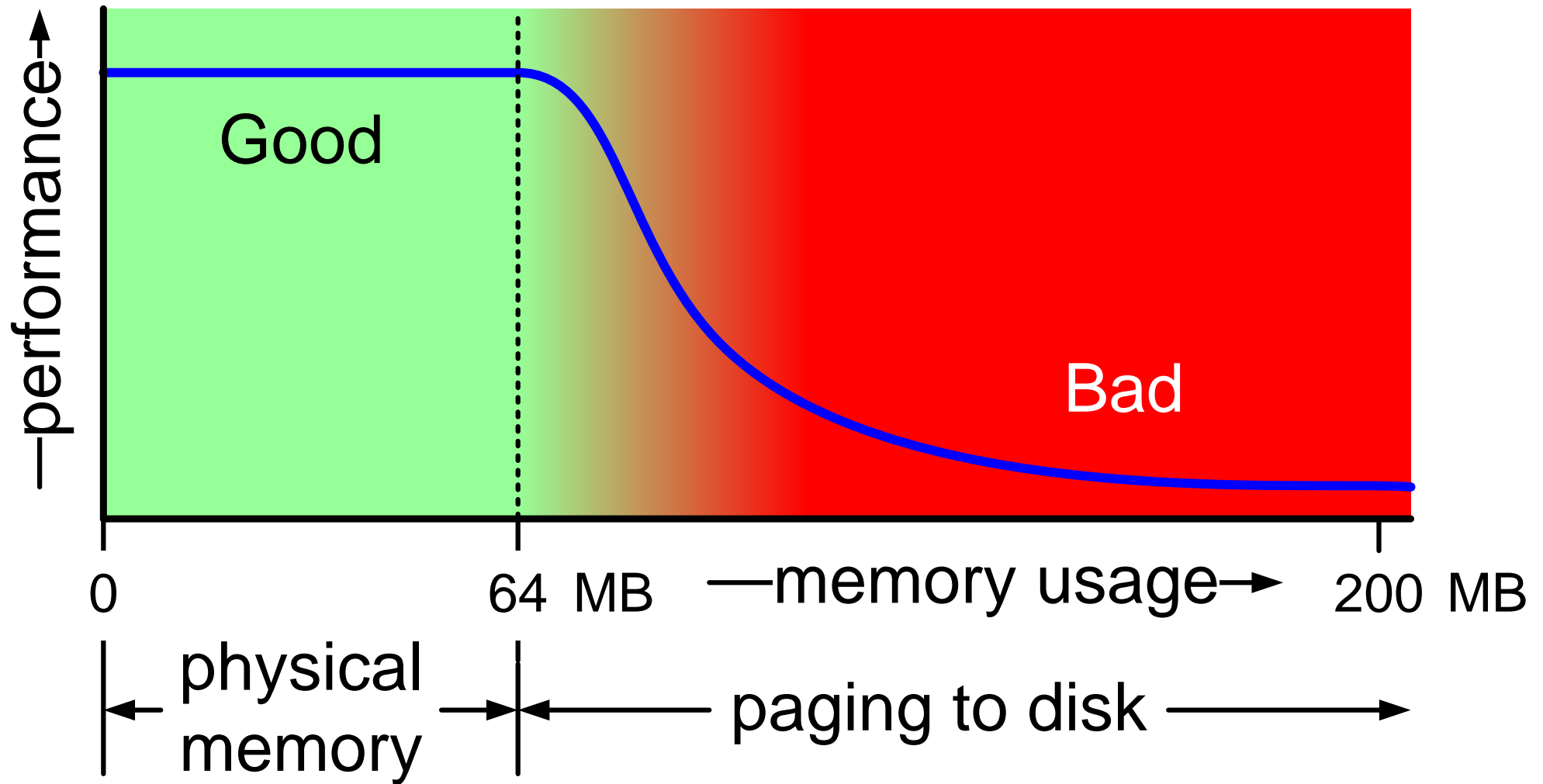
sequentialization

counterproductive optimization eg prefetching

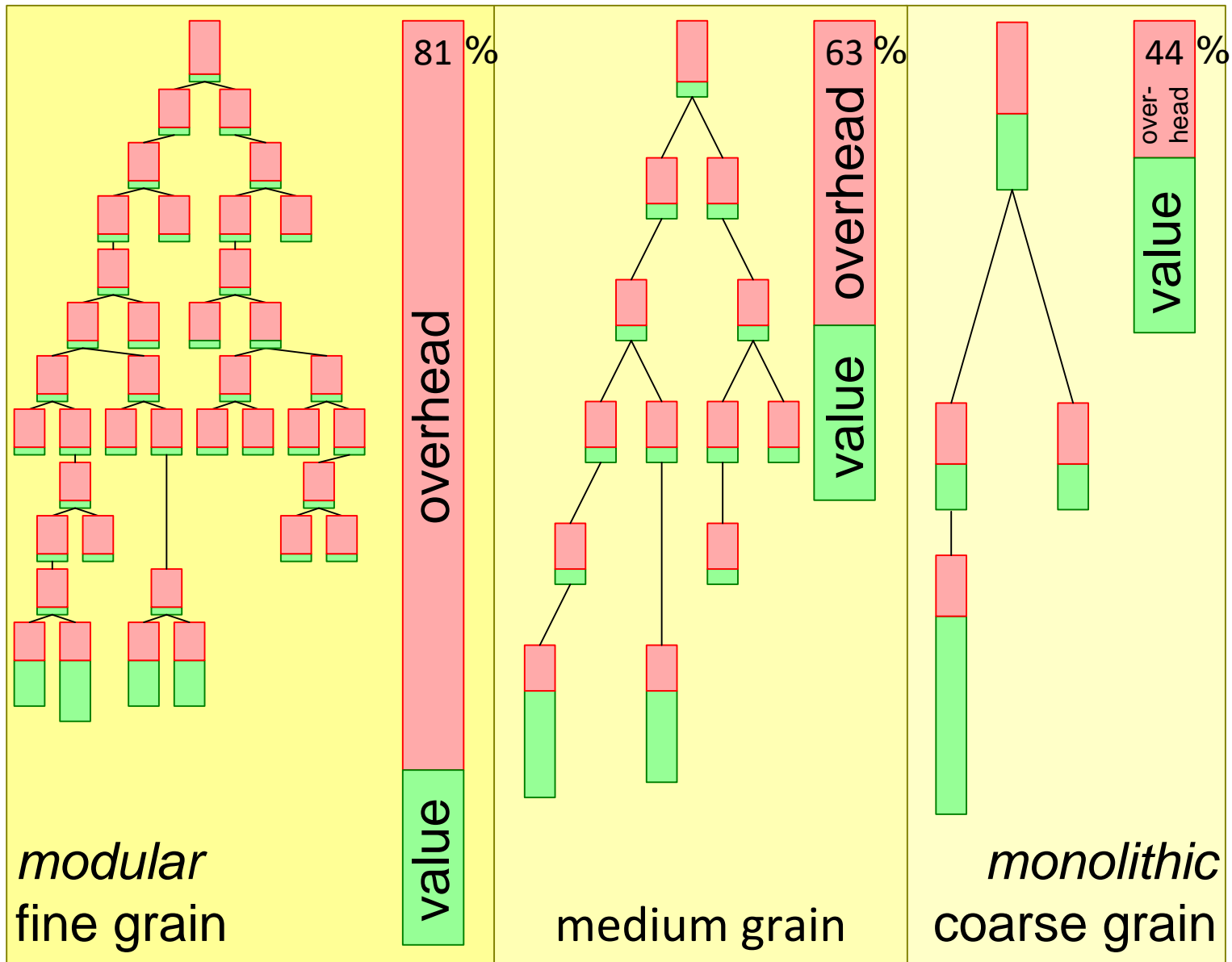
background activities virus scanners, firewalls, polling activities (Windows critical update)

scalability of algorithm e.g. searching brute force works upto ca 10000 entries

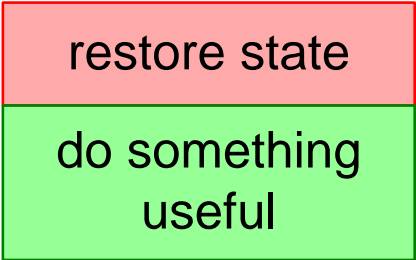
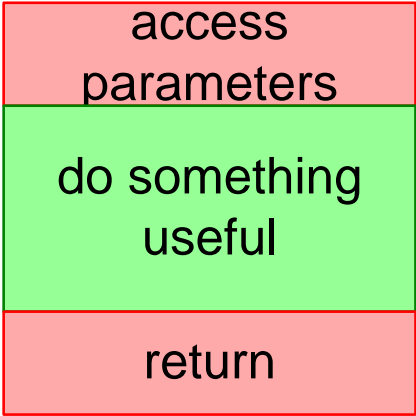
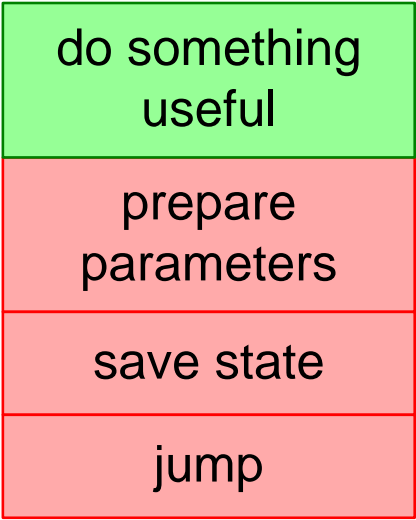
# Performance as function of memory use



# Overhead penalty of modularity

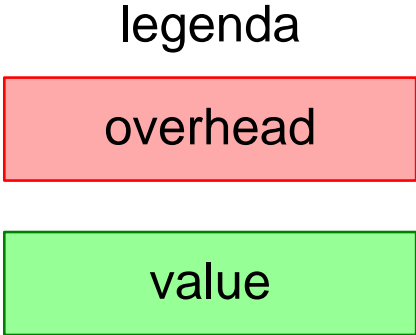


# Function call overhead

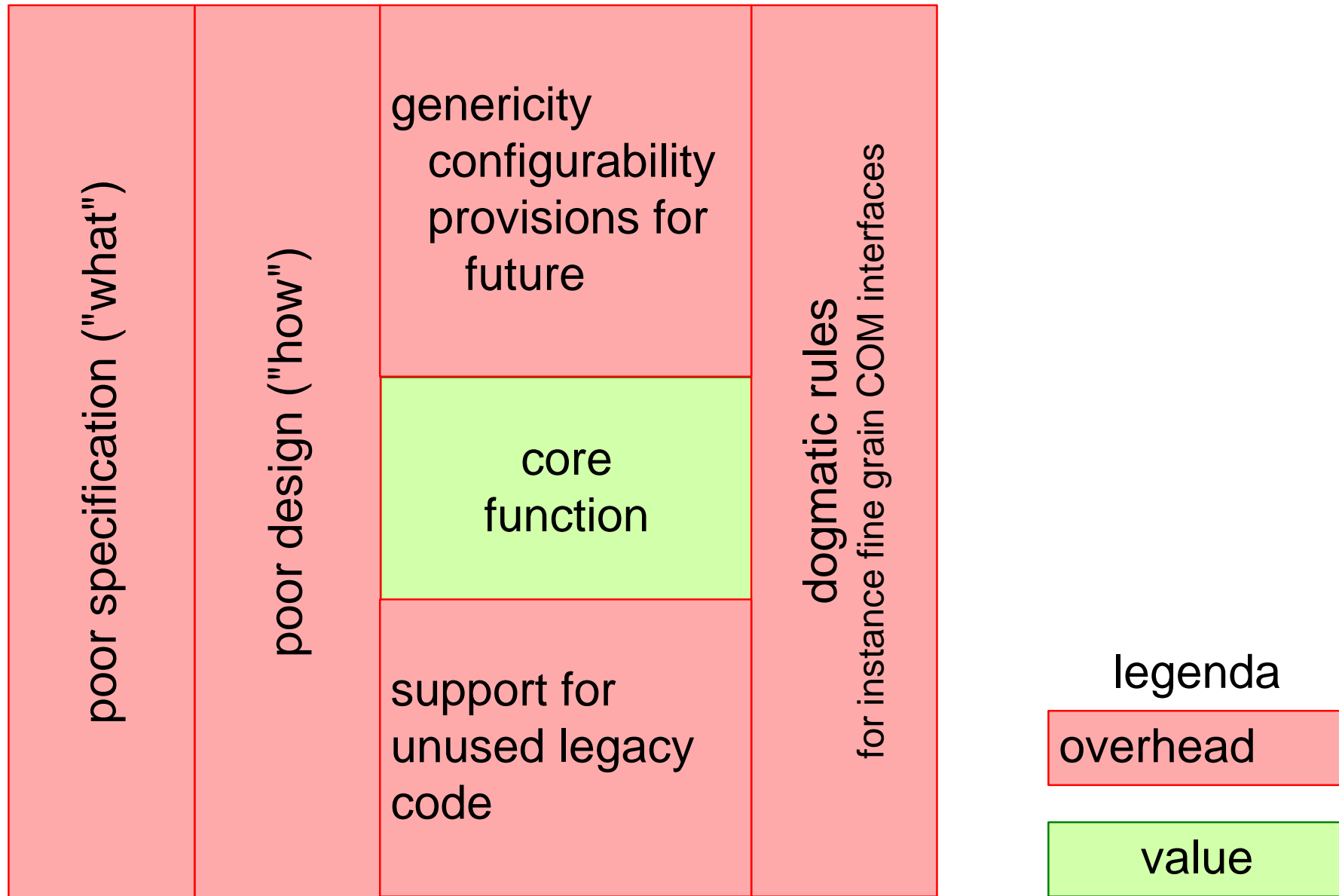


Load and depth dependent  
(hidden) side effects

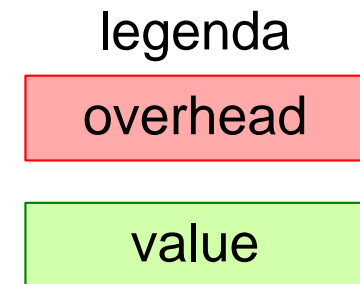
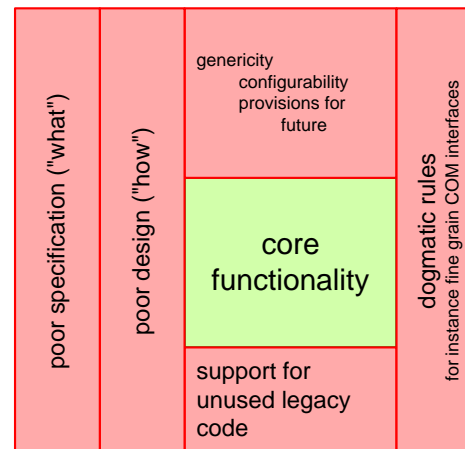
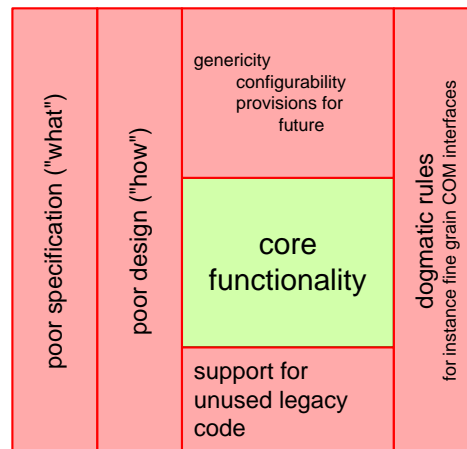
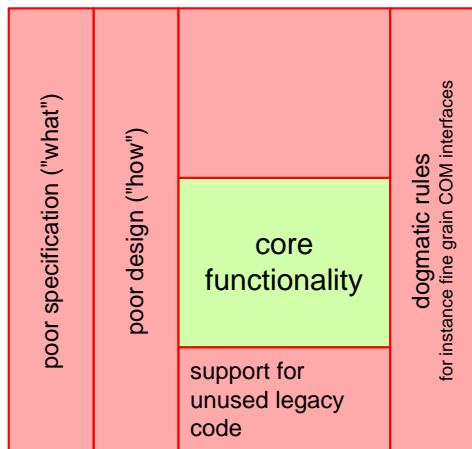
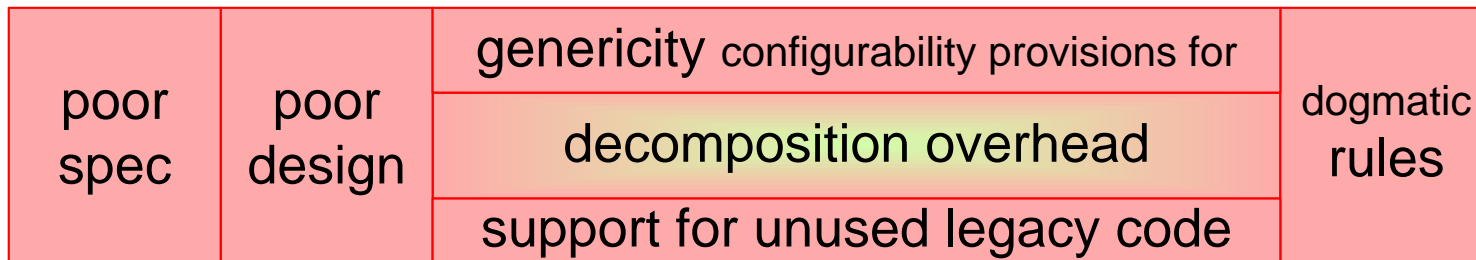
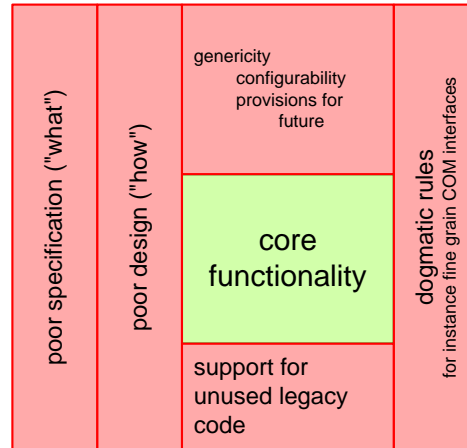
pipeline flush  
I-cache disturbance  
D-cache disturbance



# Bloating explained



# Bloating causes more bloating





# causes even more bloating...

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

