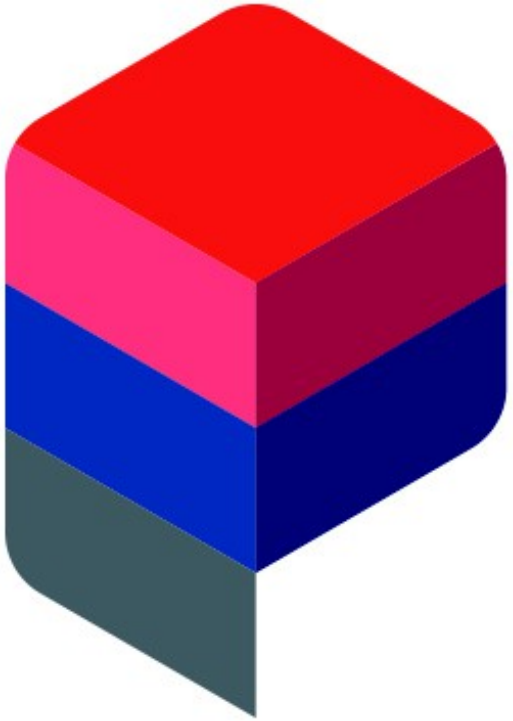


performing databases

Performance is Rarely an Accident

Martin Klier 

Performing Databases GmbH
Mitterteich / Germany

Blink and you miss it!

Excellence

Performance

is rarely an accident

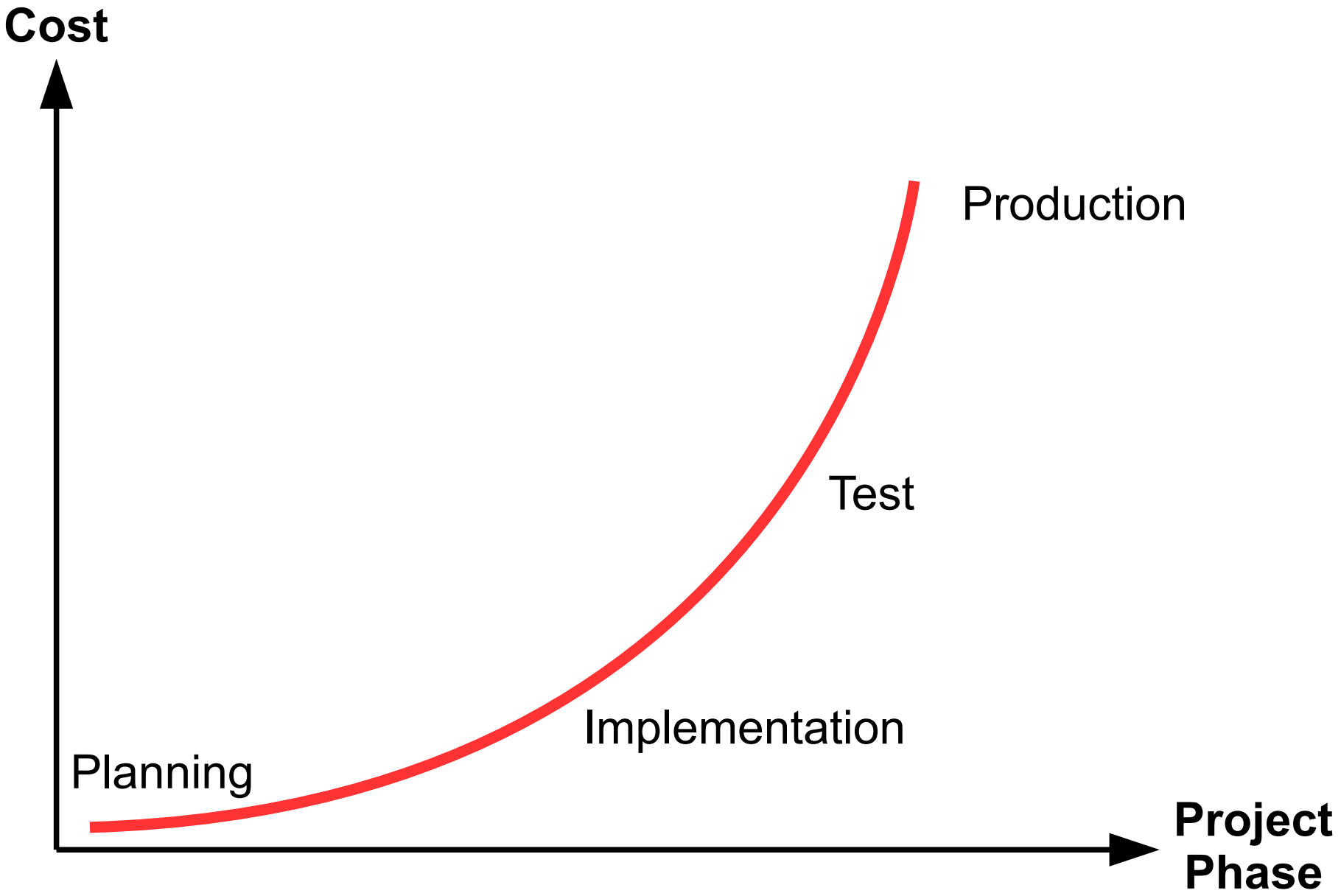
performing
databases

Know it
counts

Prove it
counts **more**

Boehm

Costs of a Change



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www.performing-databases.com

We need a plan ...

Performance

Performance

Performance

Work per Time

Kilometers per hour, tons per month ...

Time per work unit

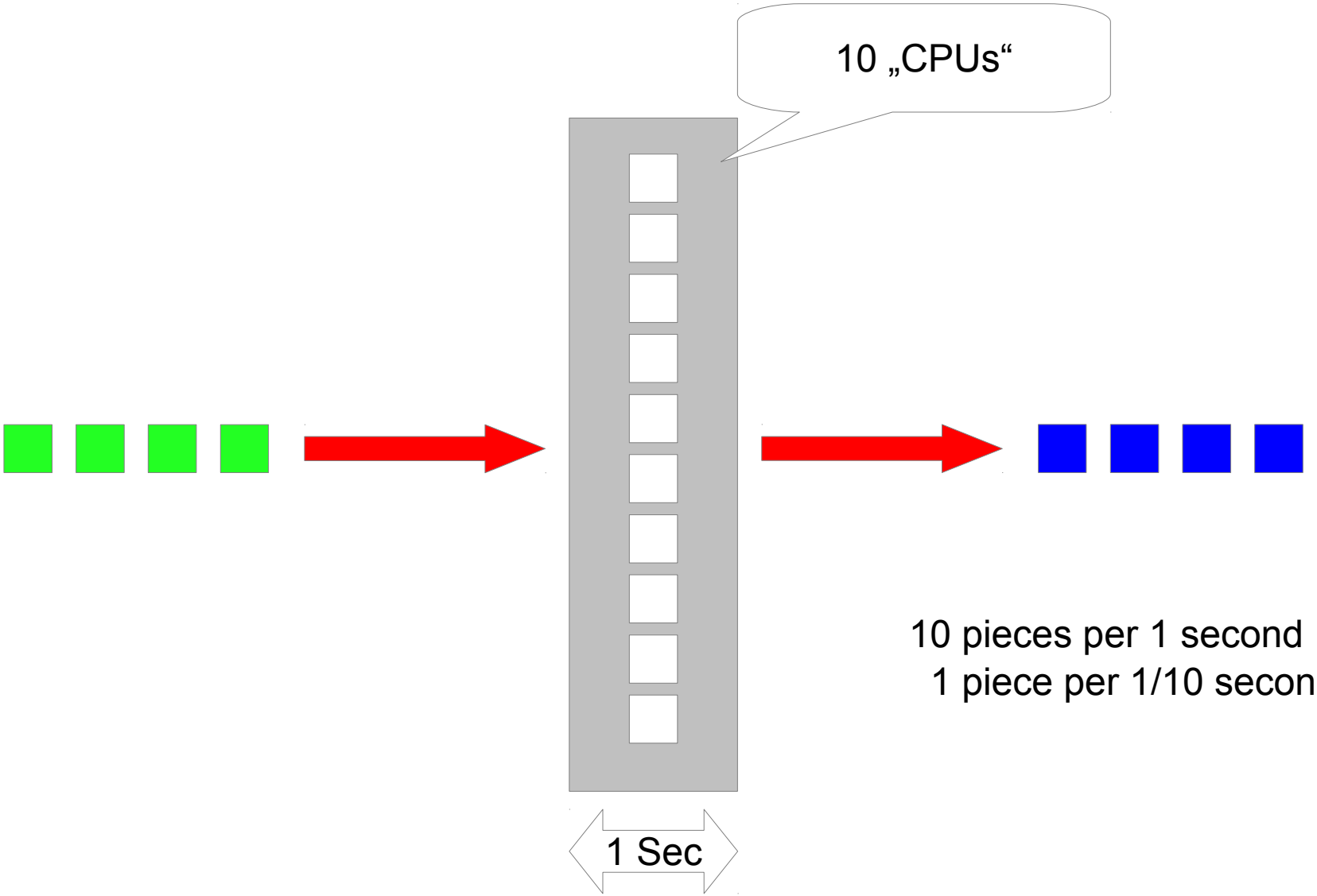
Seconds per booking, days per project

Throughput: $p = \frac{task}{time}$

Response time: $R = \frac{time}{task}$

BUT: $R \neq \frac{1}{p}$

Inverse Games



10 pieces per 1 second
1 piece per 1/10 second?

The Mean

Of the mean … and mean skew :)

0,9; 1,3; 0,9; 0,9;

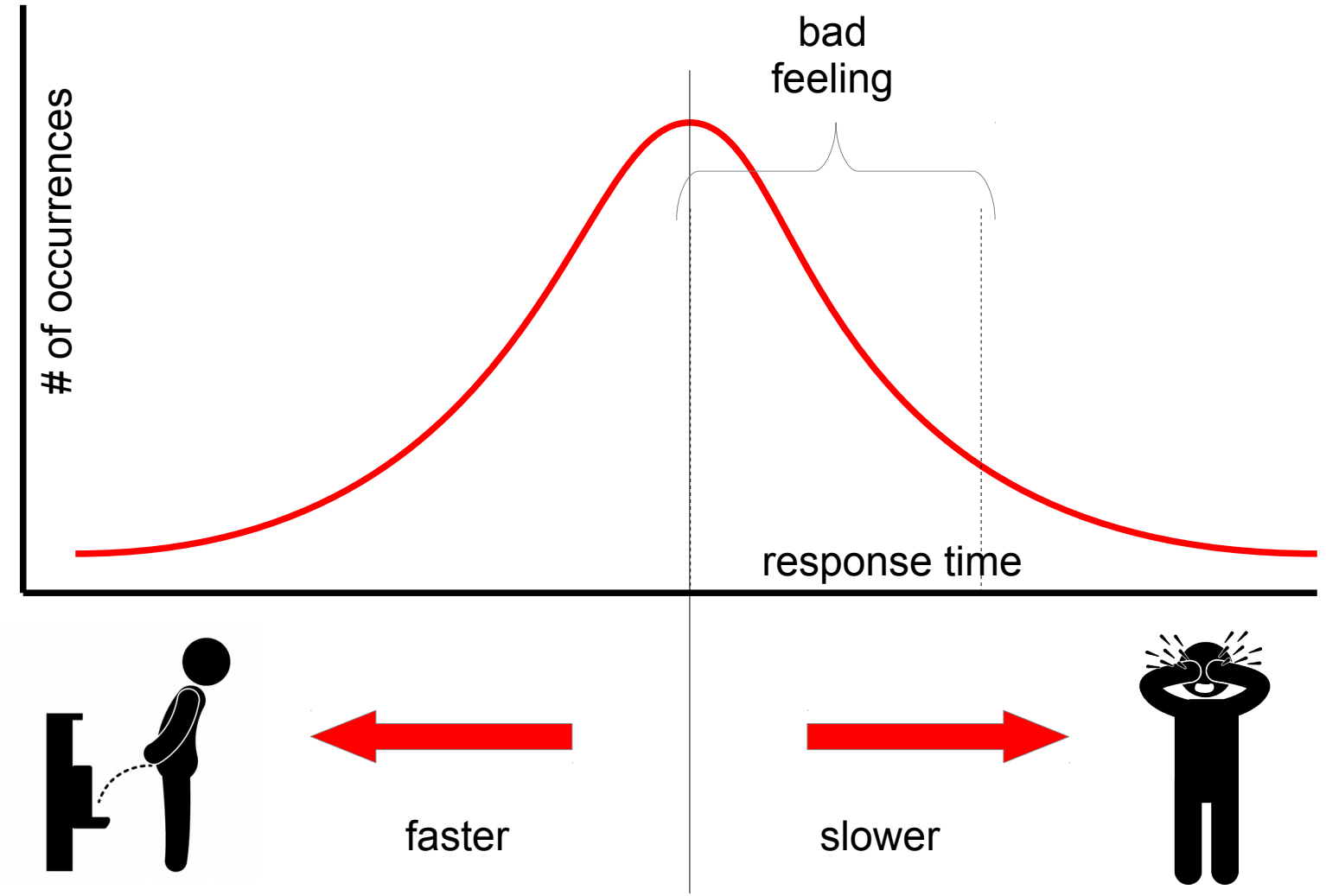
0,5; 0,5; 0,5; 0,5; 0,5; 5,5; 0,5; 0,5; 0,5; 0,5;

Of the mean ...

Specs for response time: 1s in 99%

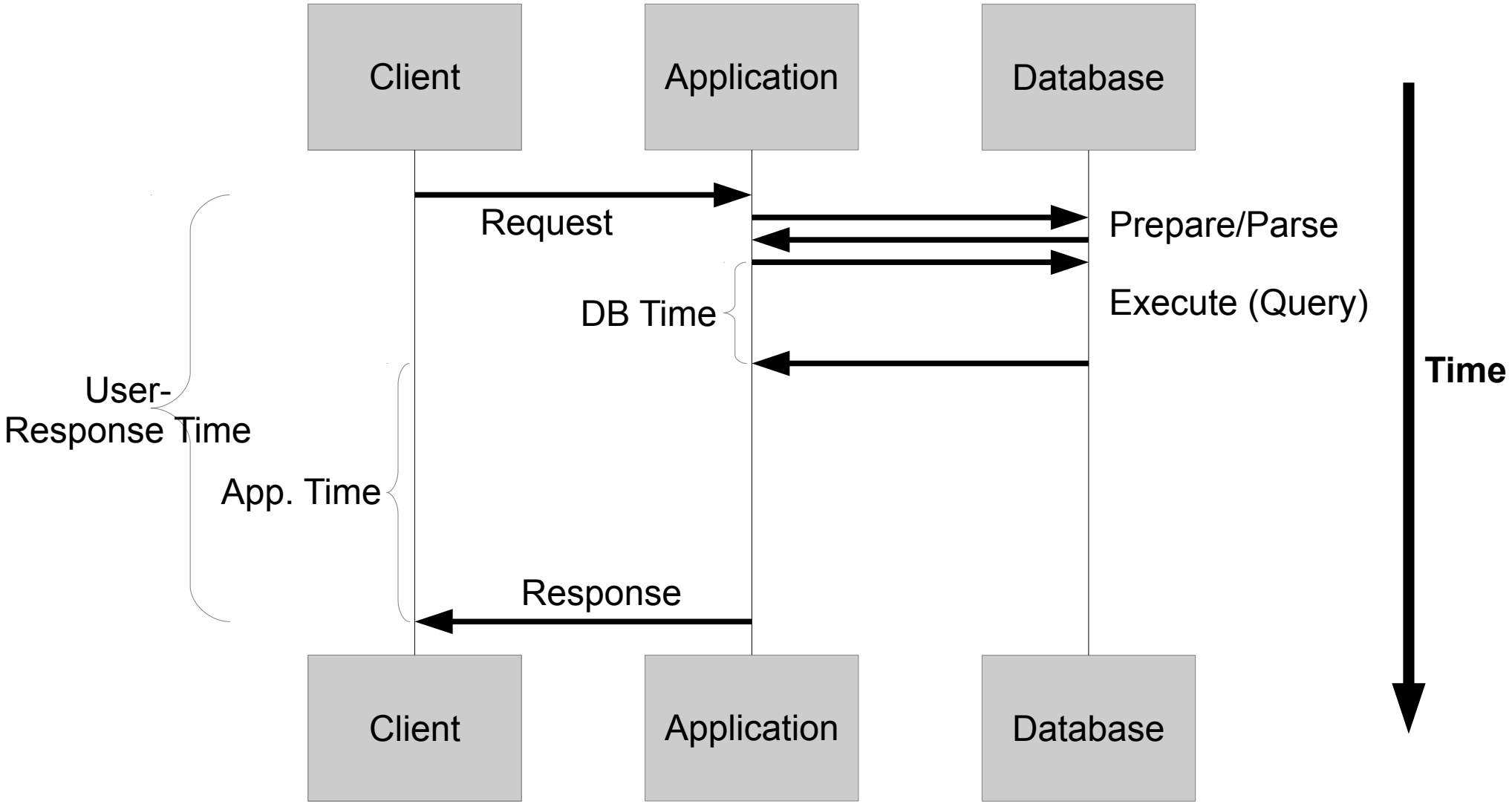
Not too bad, but ...

Users feel the difference - not the mean

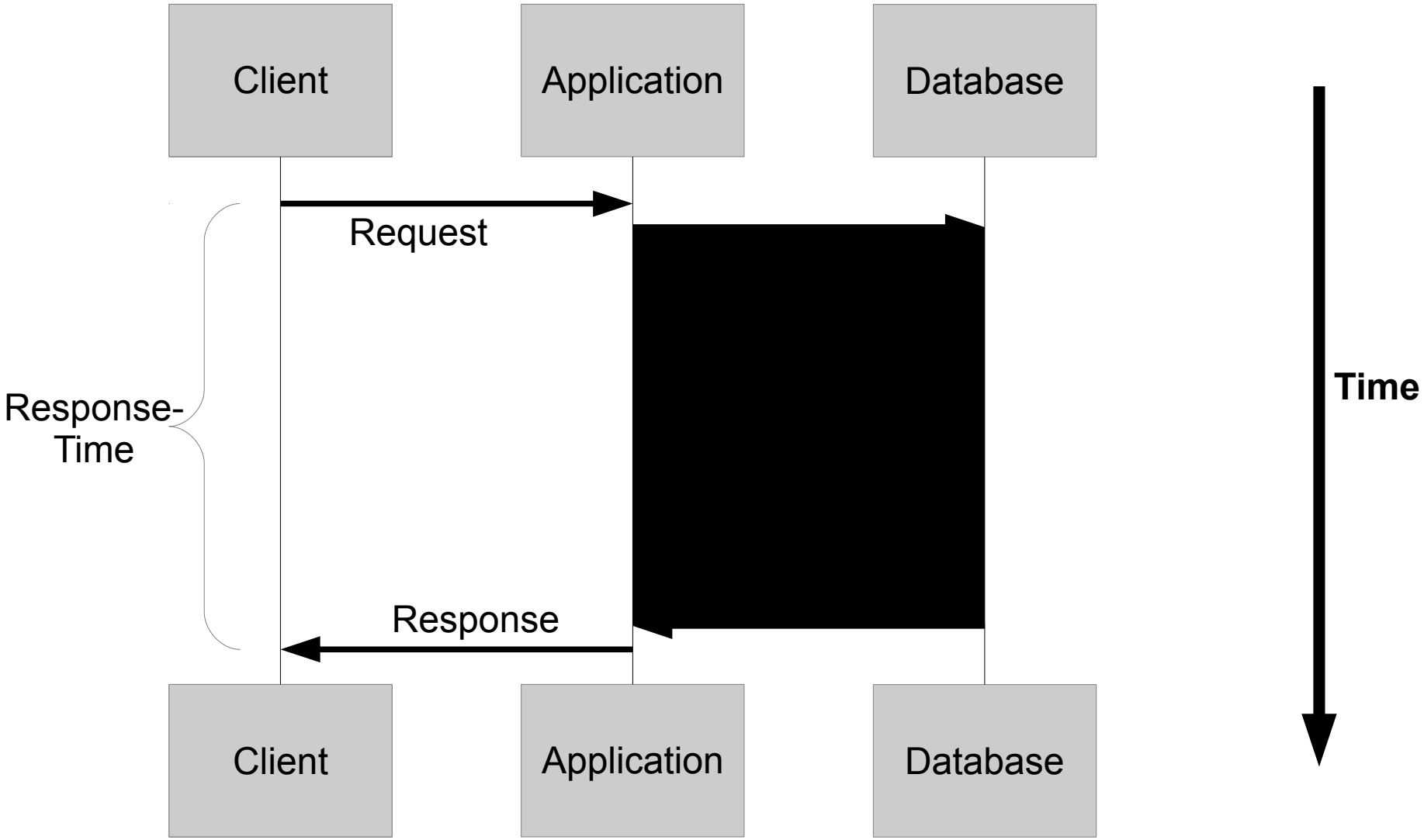


Analysis

Sequence Diagram (UML)



Sequence Diagram (UML)



Profiling

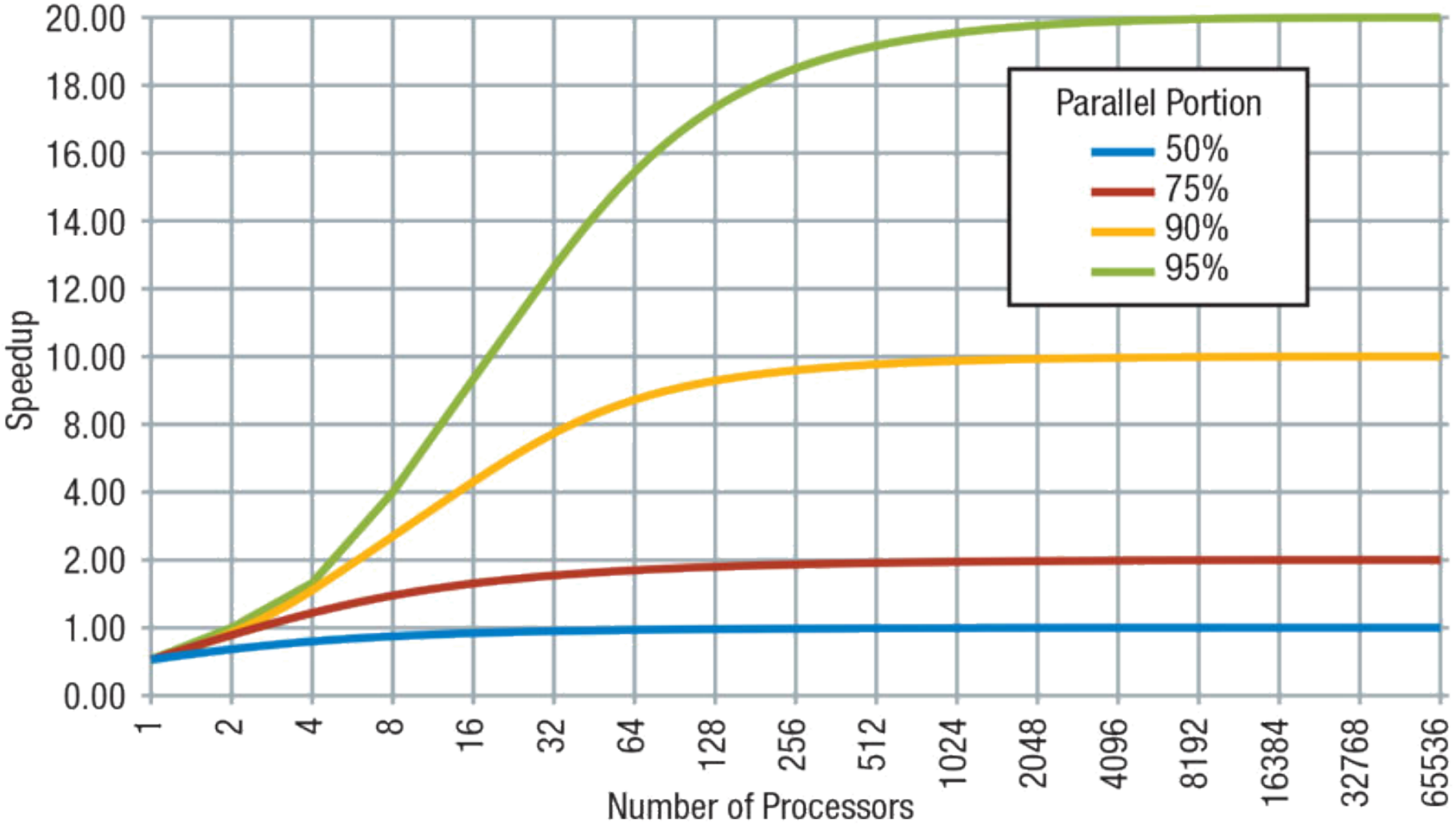
Profile

Function	R	#
Frontend Page	1700s	35.000
Frontend DB-Access	300s	2.500.000
Background-Process XML Processing	100s	100.000
Background-Process DB-Access	97s	34.000

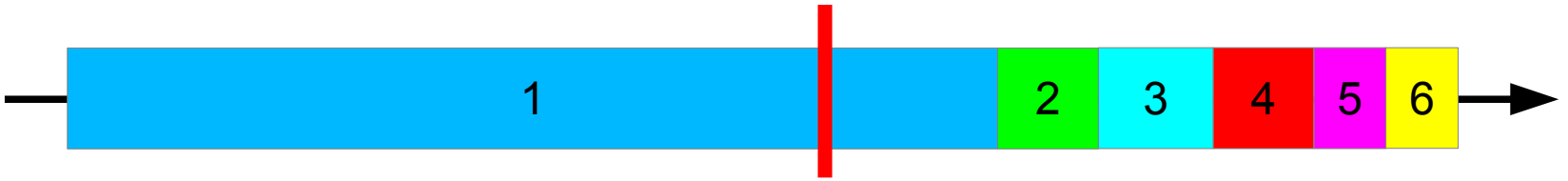
Is the requested time REALISTIC?

Amdahl's Law

Amdahl's Law - Special



Amdahl's Law - General
Is it realistic?



#	Poss. Improvement	Cost	R	R%
1	34%	€€€€	1.700s	70%
2	12 %	€	300s	13%
3	none	-	100s	6%
4	4 %	€	97s	4%
5	0,1%	€€€€	58s	3%
6	1,6%	€	48s	2%
...	...	...	...	...

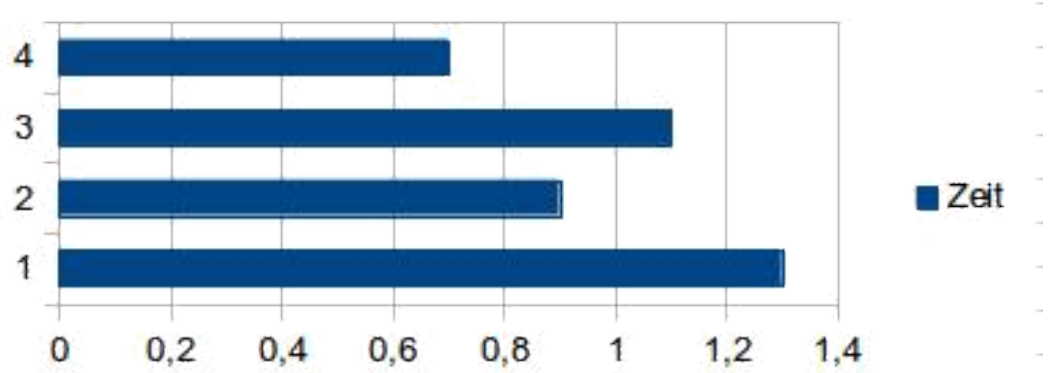
Skew

Catching runaways (Skew inside!)

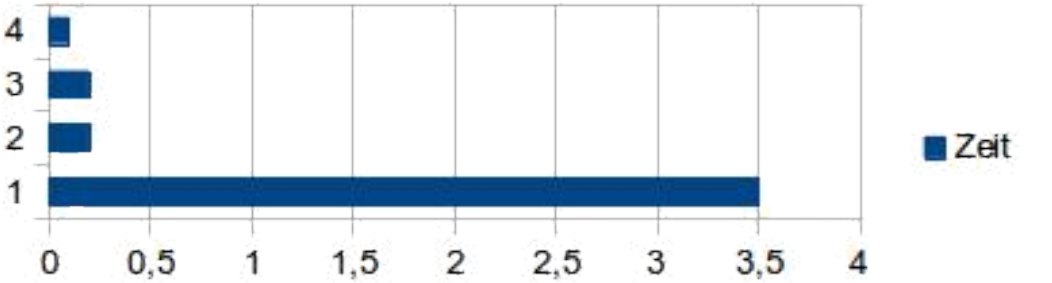
4 calls = 4 sec

2 calls = ? sec

Event	Duration (s)
4	0.7
3	1.1
2	0.9
1	1.3



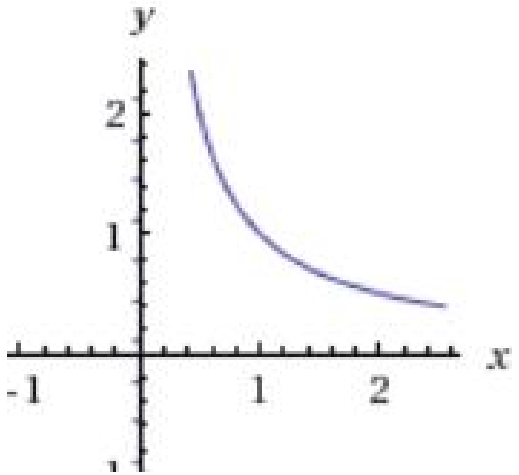
Event	Duration (s)
4	0.1
3	0.2
2	0.2
1	3.5



Efficiency

Efficiency

$$efficiency = \frac{1}{wastage}$$



Obviously, the highest type of efficiency is
that which can utilize existing material
to the best advantage

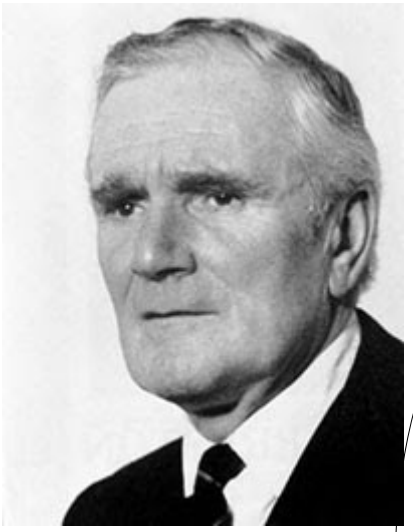
-- Jawaharlal Nehru

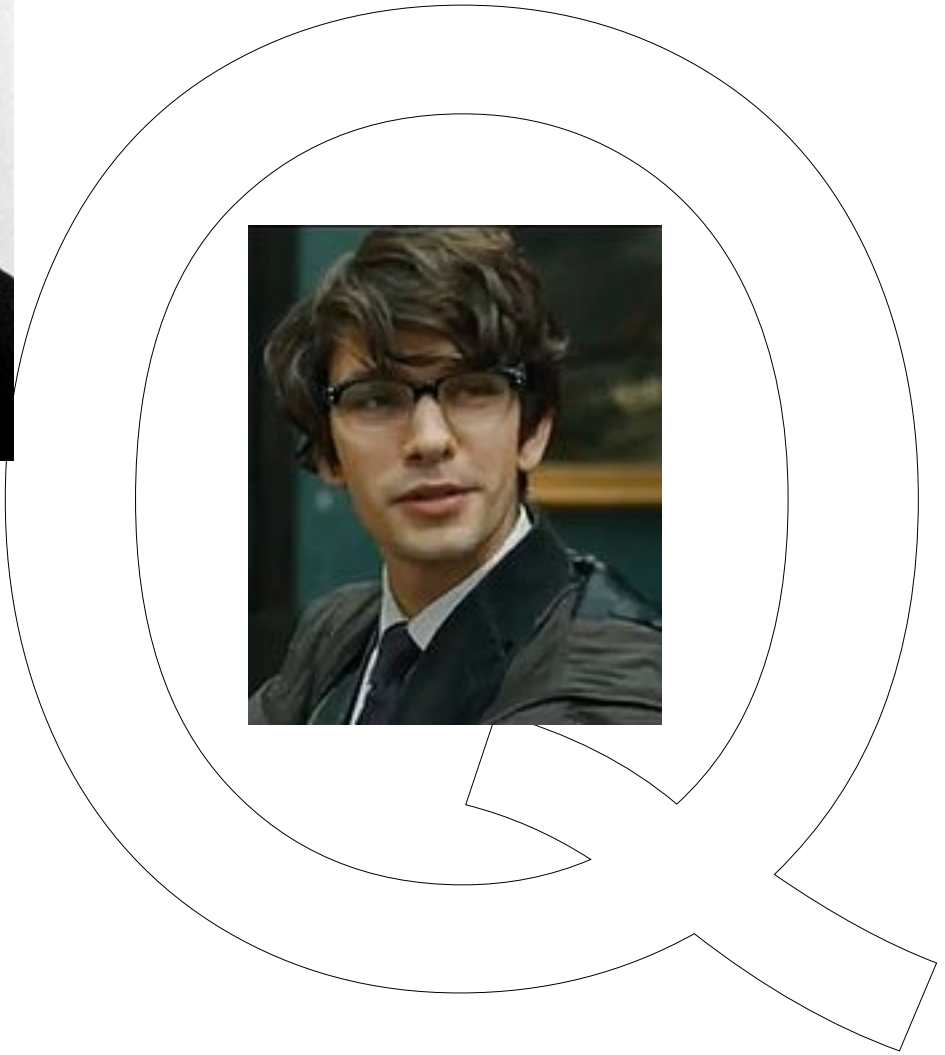
Load

Fastfood - What is „Q“?

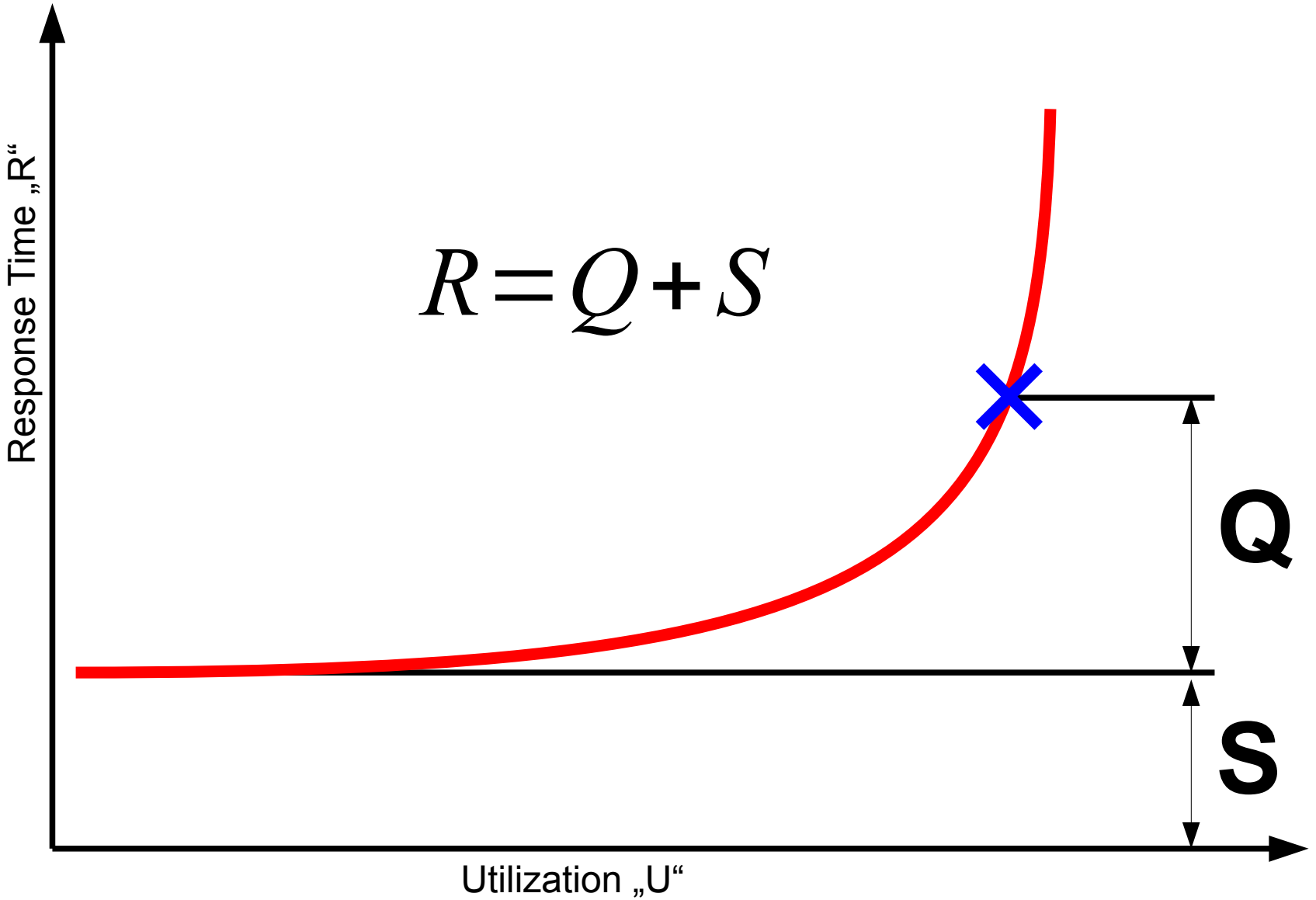
Function	R	#	Type
Wait in line	0s - 600s	1	Q
Order menu incl. questions	30s	2	S
Fetching fries	45s	2	S
Filling drink	45s	2	S
Waiting for the Burger	0s-120s	1	Q
Fetching Burger	10s	2	S
...	...	...	...

Types of „Q“ :)





Queueing Theory - the „Q“ - Diagram



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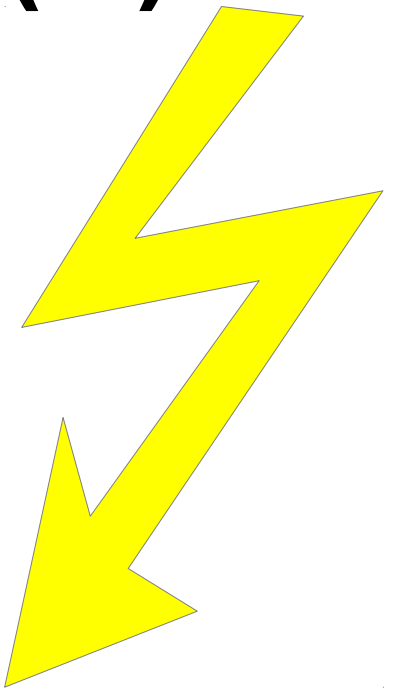
The Elbow

The Elbow

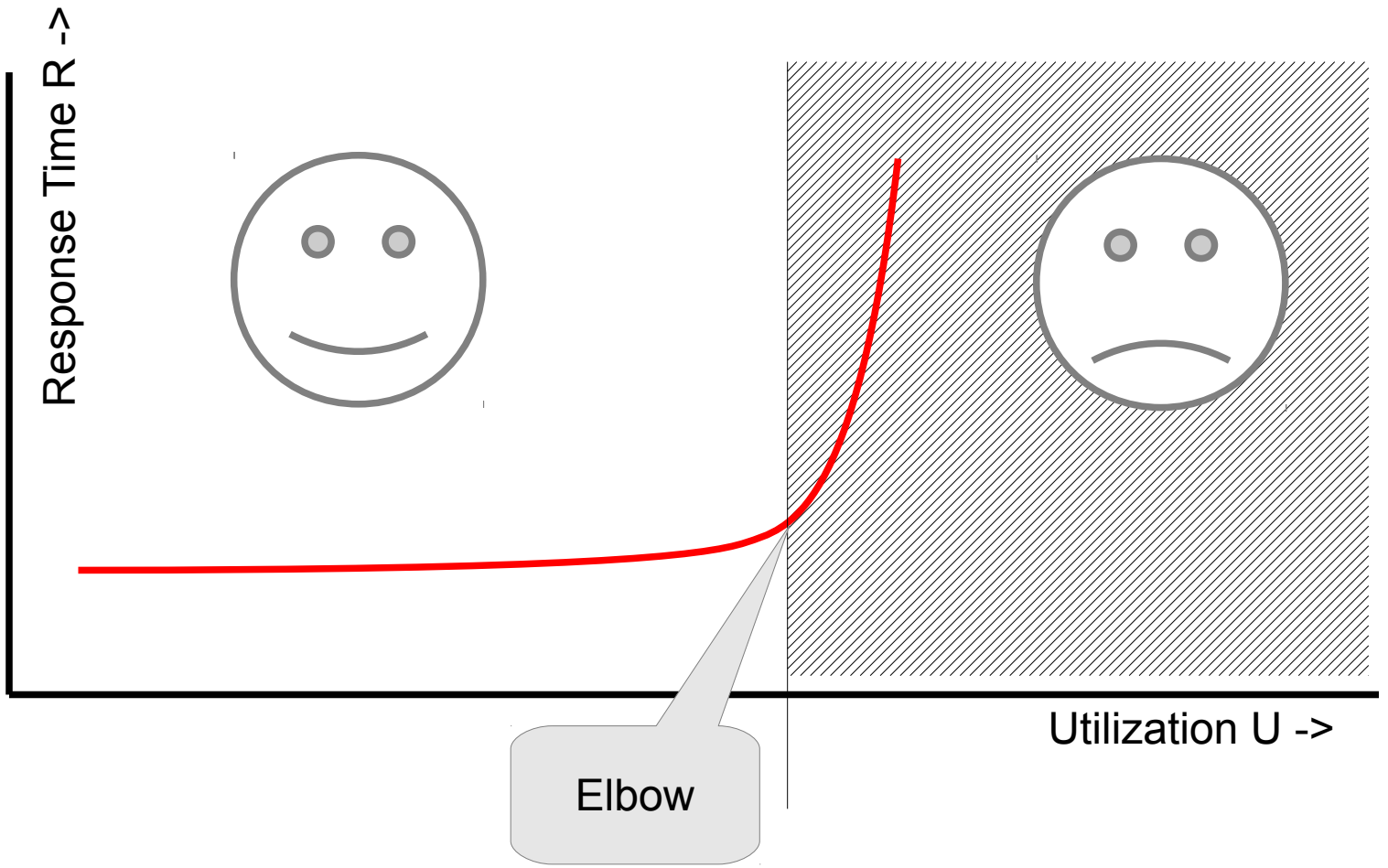
Fast Response Times (R)

vs.

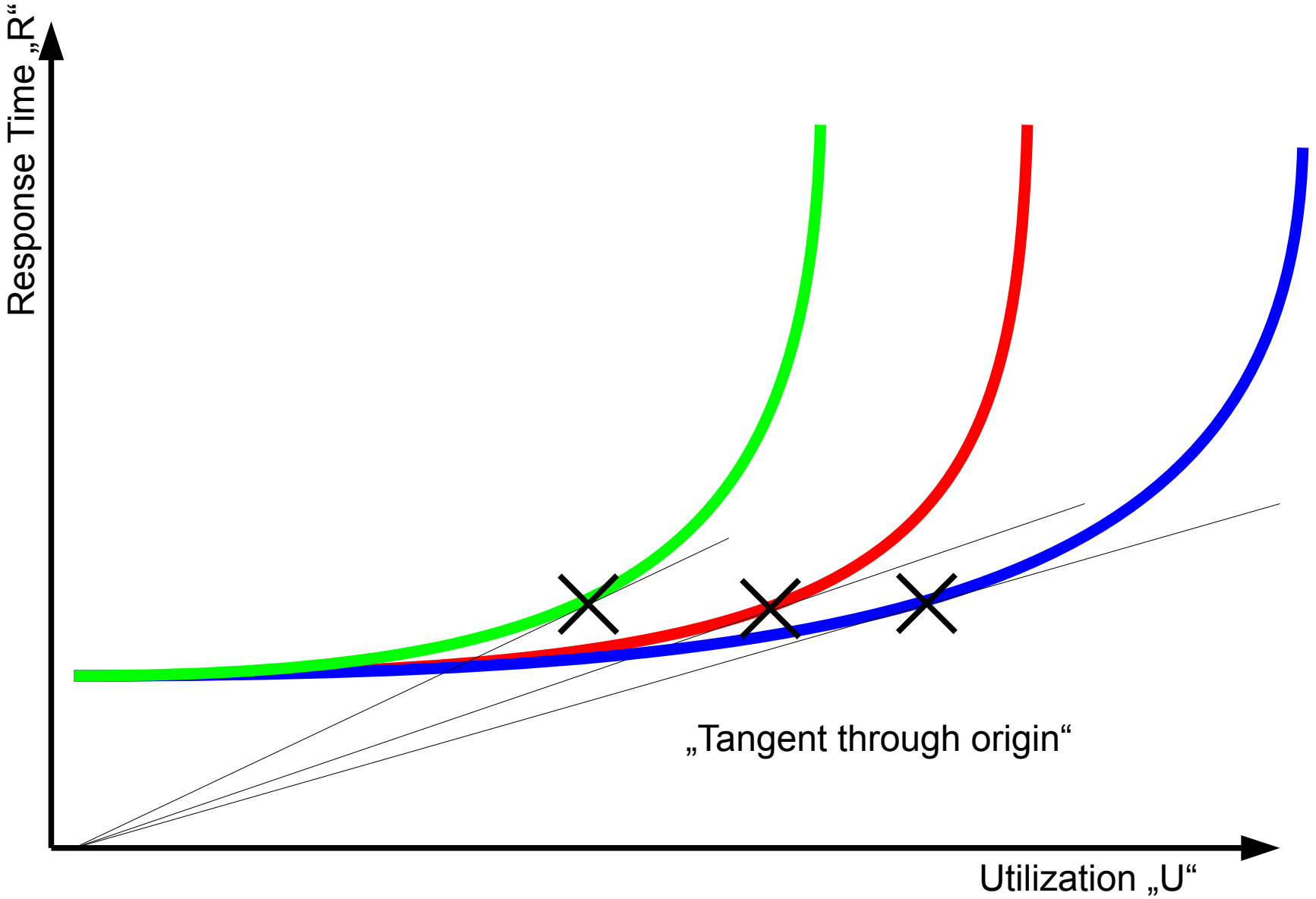
High Throughput



Relevance of the elbow



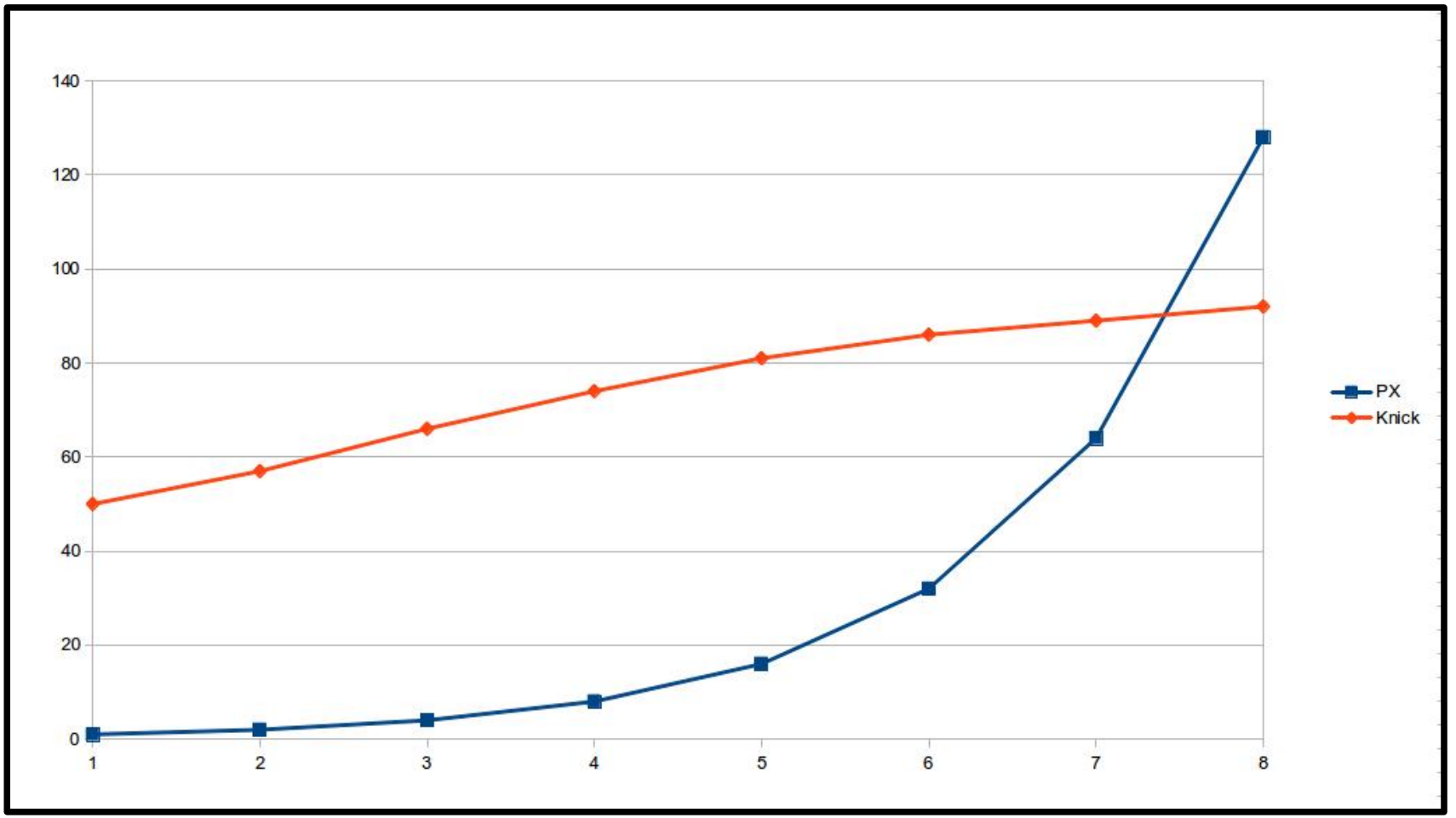
Where is the elbow?



Scalability:
Elbow follows delayed

Service channels / degree of parallelism	Elbow at % of overall utilization
1	50%
2	57%
4	66%
8	74%
16	81%
32	86%
64	89%
128	92%

Scalability:
Elbow follows delayed



Capacity planning

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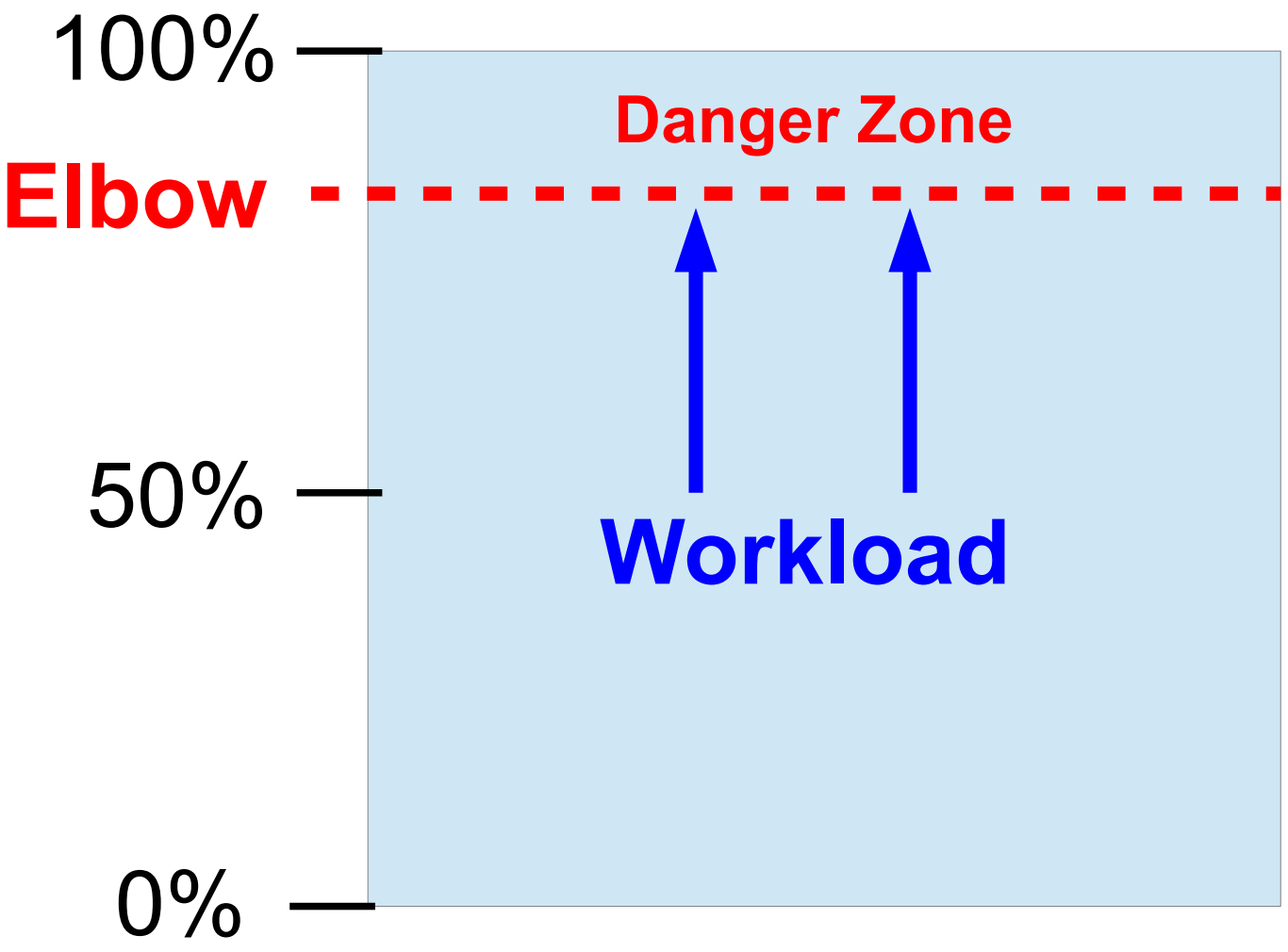
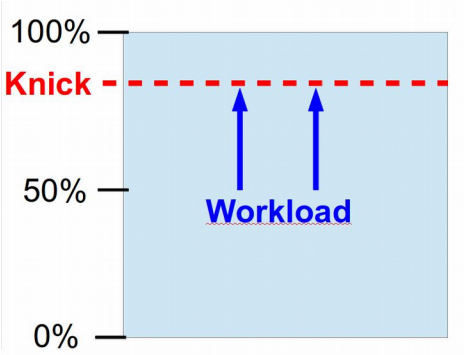
Capacity planning



Capacity planning

Capacity planning

How big has it to be?



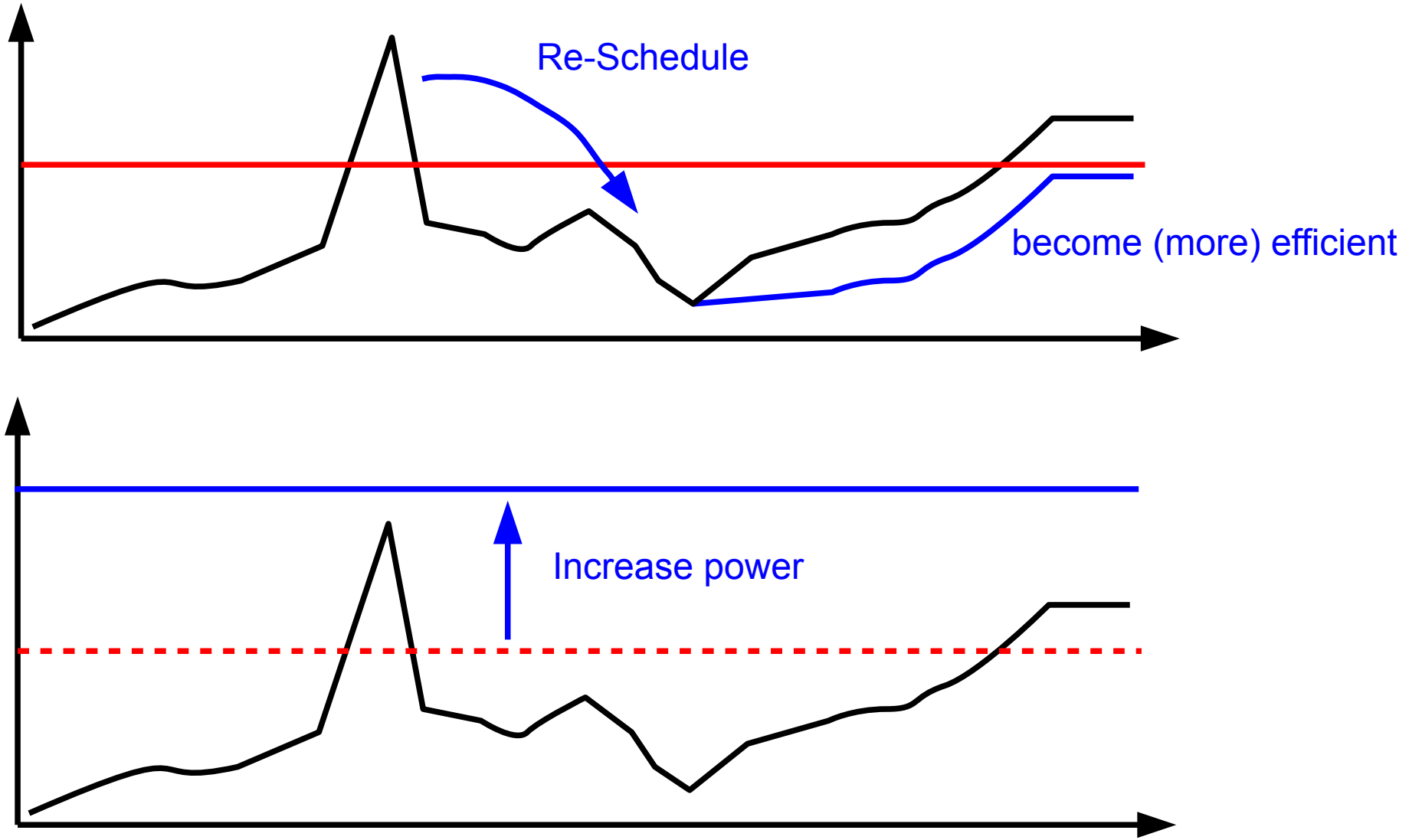
Utilization management:

How small can it be?

=> The elbow is the new 100%

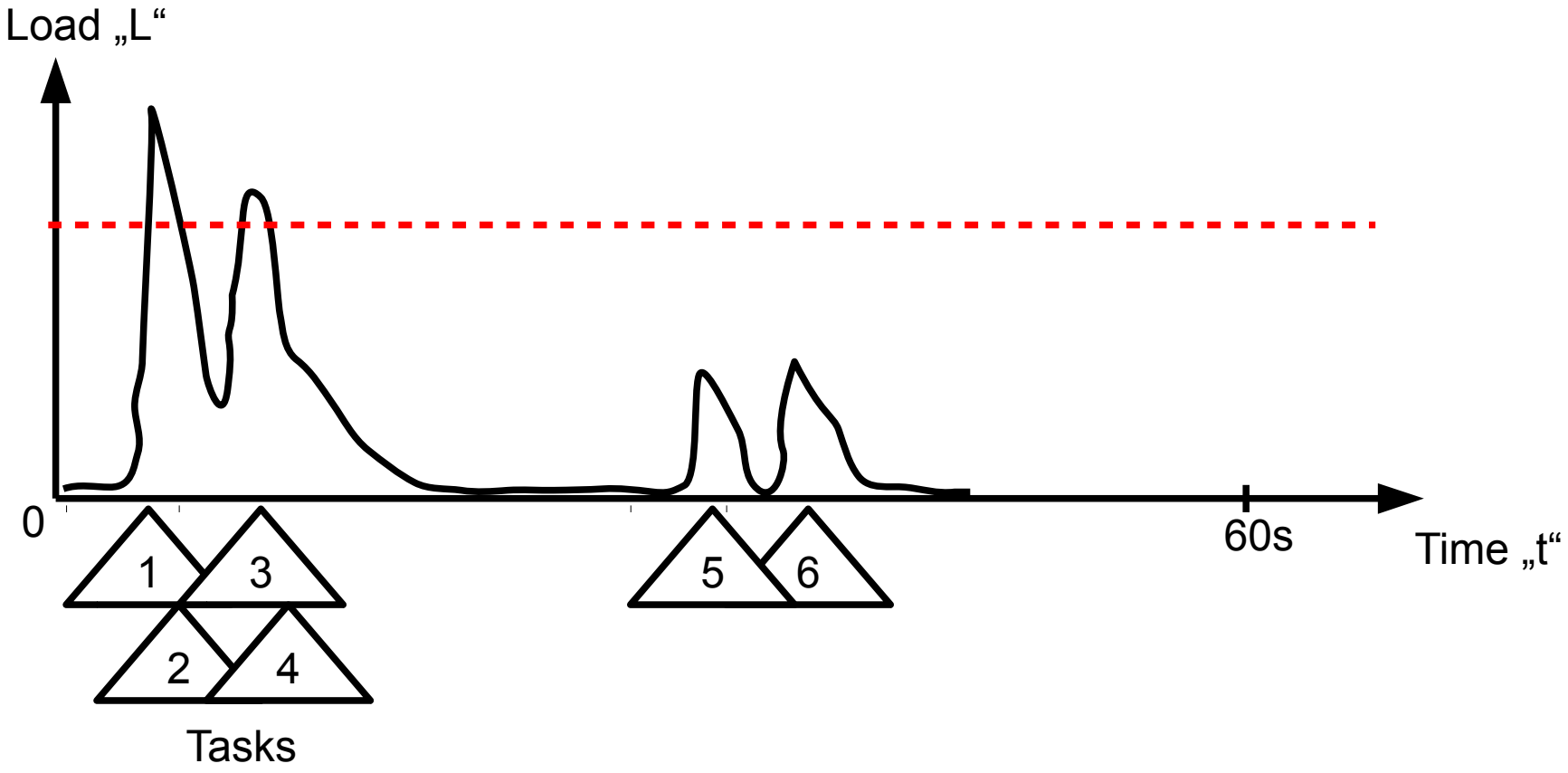
Reducing Peaks

Peaks

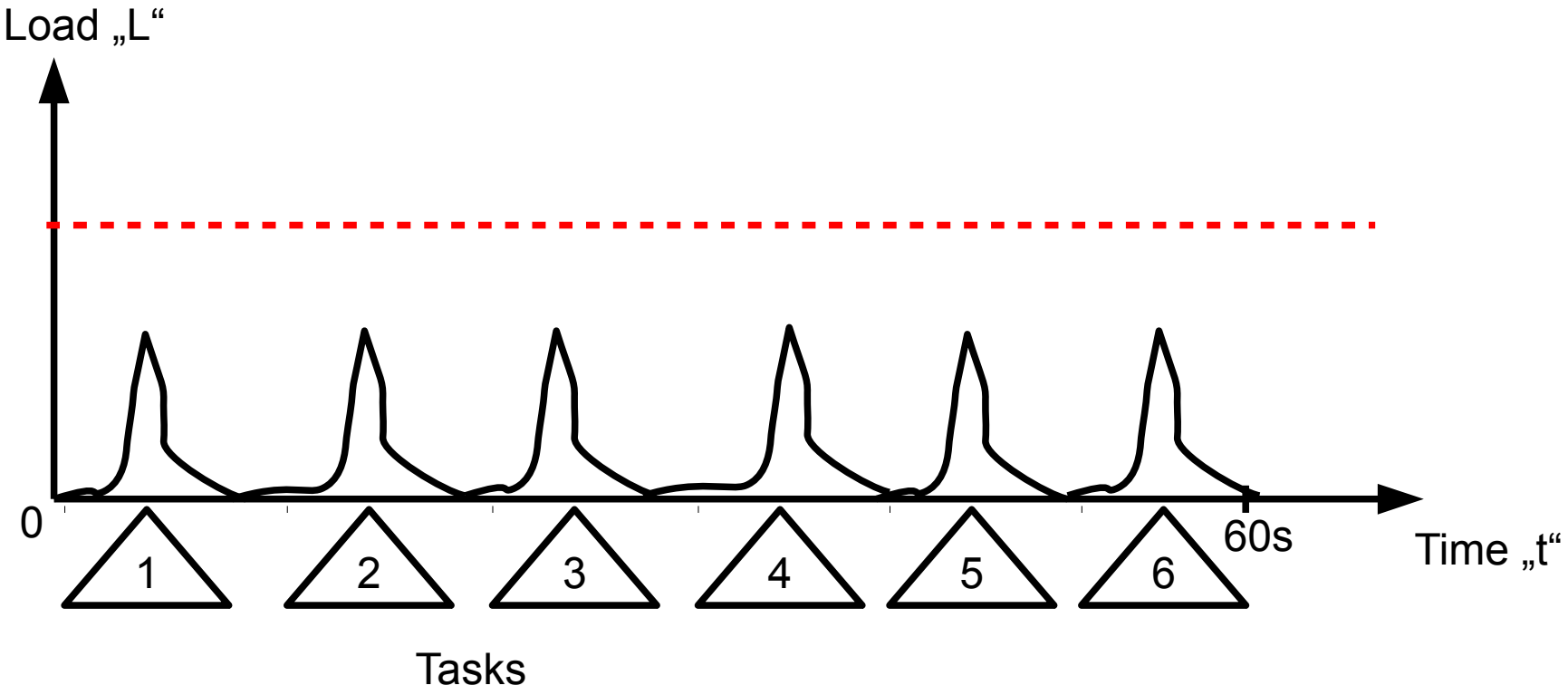


Random Arrivals

Random

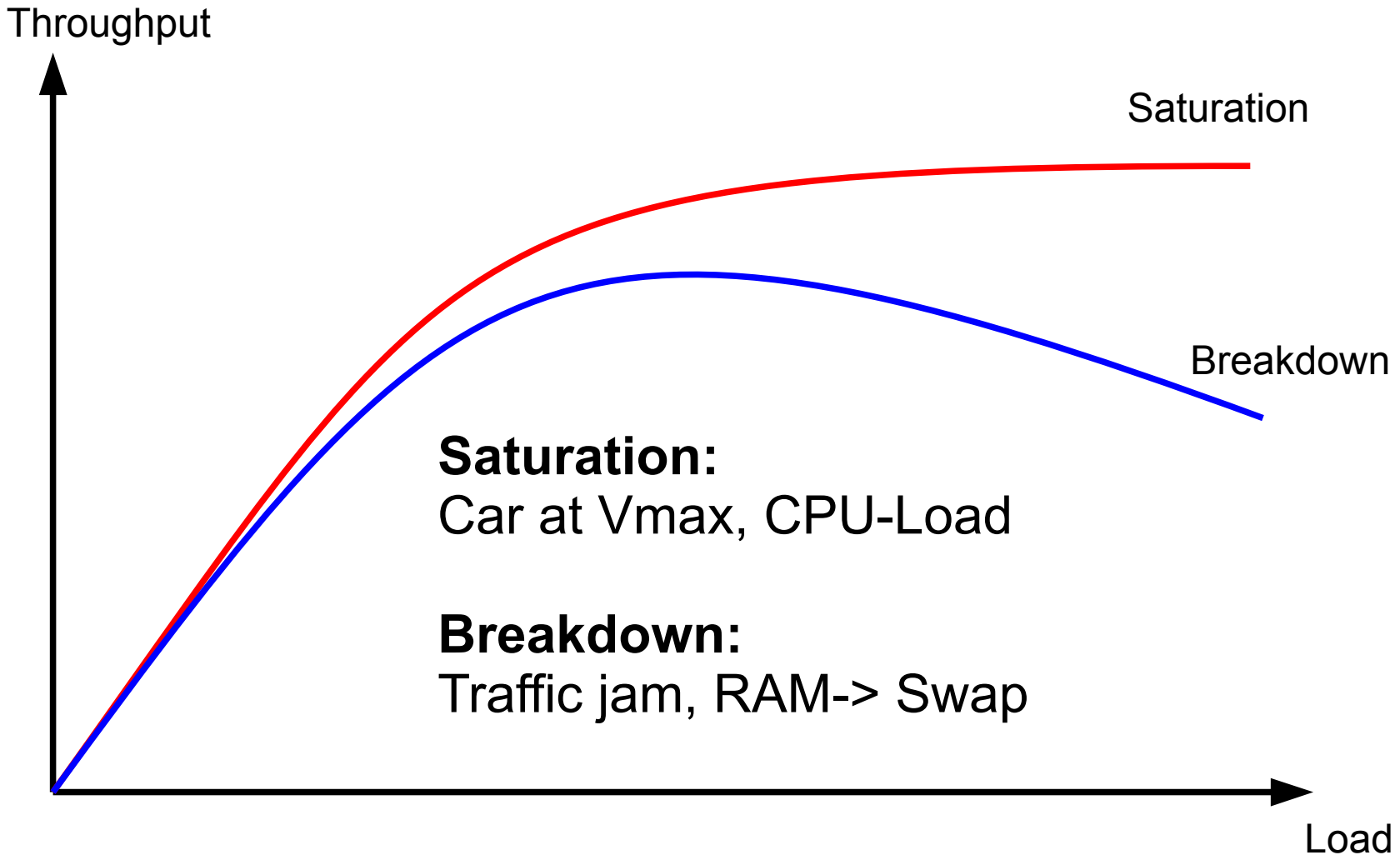


Deterministic



The delay in the bigger picture

Two-class Society



Performance Testing

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Just do it!

You'll find more if you try ...

You'll never find everything.

to measure

/'tu: 'meʒə/

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Measure what?

Throughput!

and

Response time!

S.M.S.

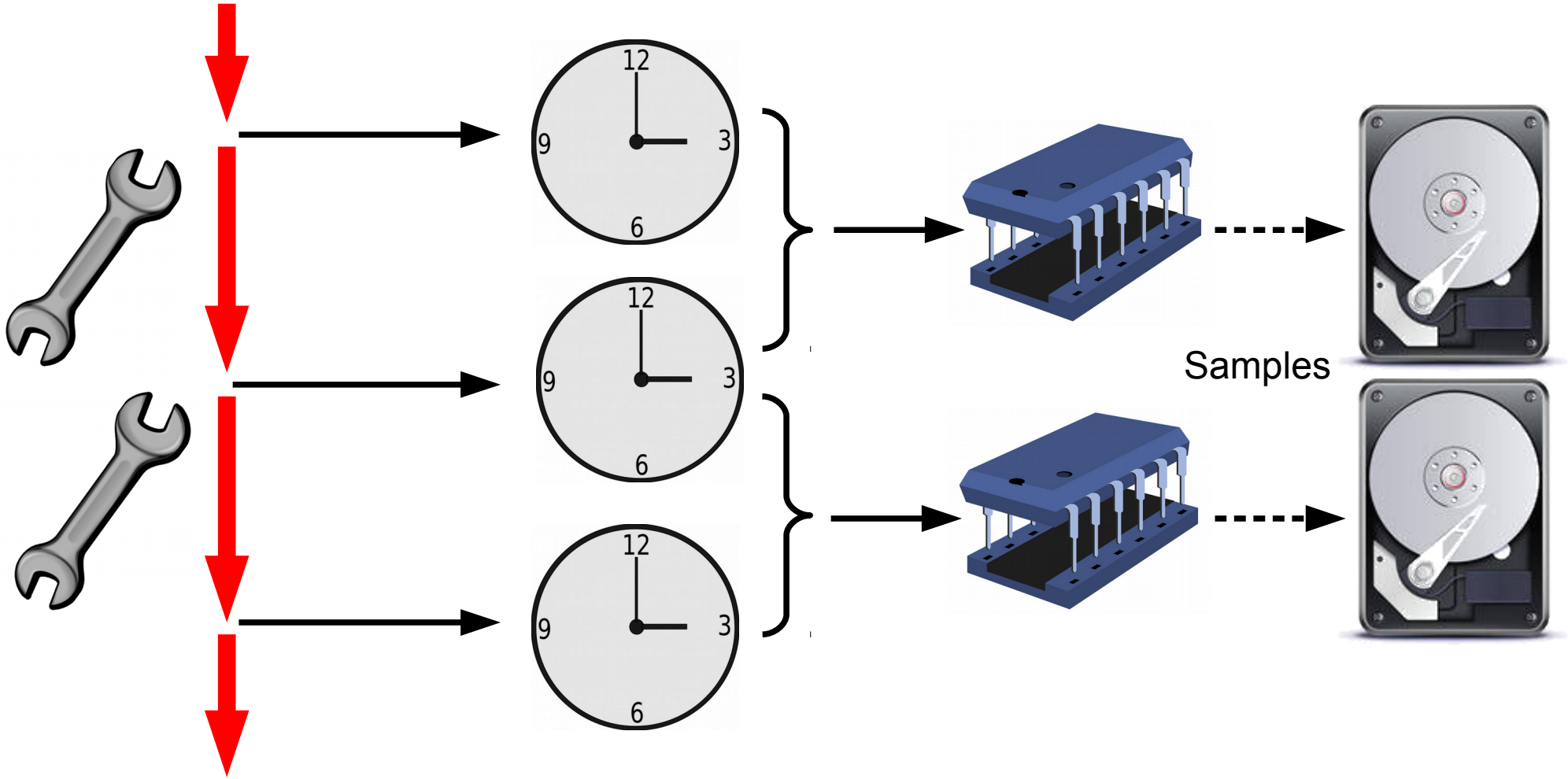
Seiner Majestät Schiff?
Short Message Service?

Surrogate

Measure

Sucks

Measure everything - Reduce data



Code Instrumentation

Performance is a feature

Performance is a feature!

Planning <- Cost

Implement -> Use

Specify in same detail

as you do with other features

Overhead

- 30%

By qualified Instrumentation (=Feedback) you'll improve quality.
This leverages the additional cost by far.

(More) Ressource Consumption

Makes you (more) vulnerable

Speaker

- Martin Klier
- Solution Architect and Database Expert

- My focus:
  - Performance + Tuning
  - highly avalable Systems
  - Cluster and Replication

- Linux since 1997
- Oracle Database since 2003

ORACLE ACE Director

Performing Databases

- Three (soon 4) Experts for Database Technology
  - Concepts and Project Competence
  - Architekture- und System planning
  - Licensing
  - Implementation and Troubleshooting

- Contact
  - Performing Databases GmbH
    Wiesauer Straße 27
    95666 Mitterteich // Germany

  - Web: http://www.performing-databases.com

  - Twitter: @PerformingDB

Speaker

- Meet & Greet

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FOR THE ORACLE COMMUNITY

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Migration Day
Mannheim
February 19th, 2019

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- Contact: martin.klier@performing-db.com
- Web/Blog: www.performing-databases.com

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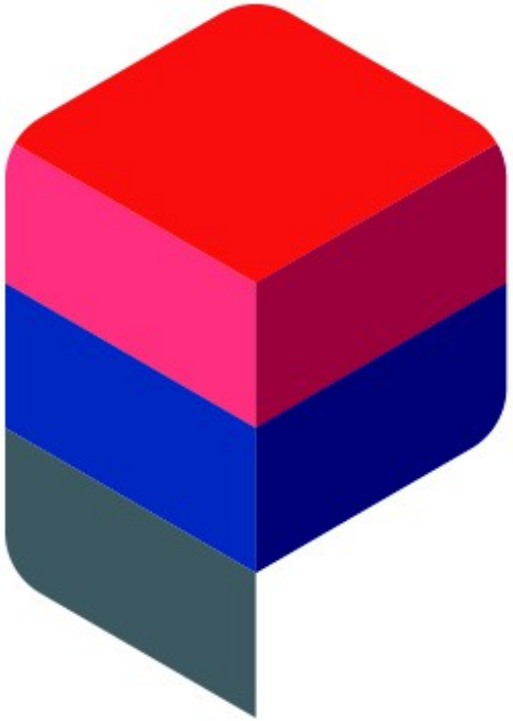

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