

Measuring the Quality of the Software Engineering Process

Dr. Ingo Elsen, T-Systems Systems Integration

UKSI/A Conference, October 14th, 2010, 13:45

T-Systems Systems Integration

Delivery Portfolio

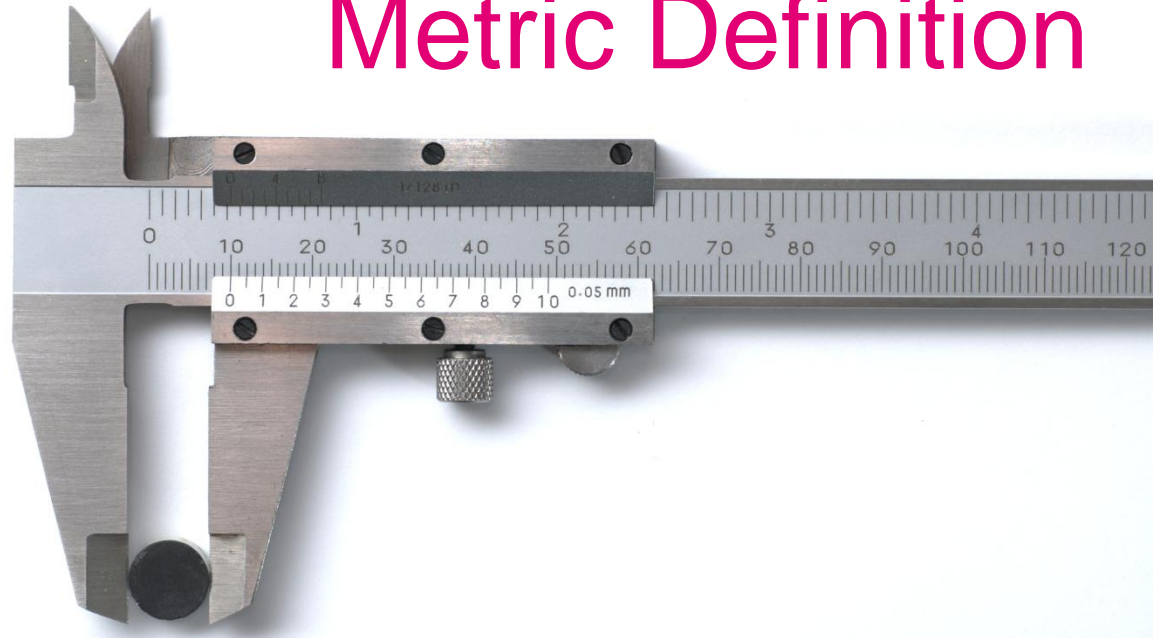


- Telecommunication
- Automotive
- Travel, Transport & Logistics
- Aerospace/Defense/Security
- Public
- Other Discrete Manufacturing Industry
- Healthcare
- Horizontals

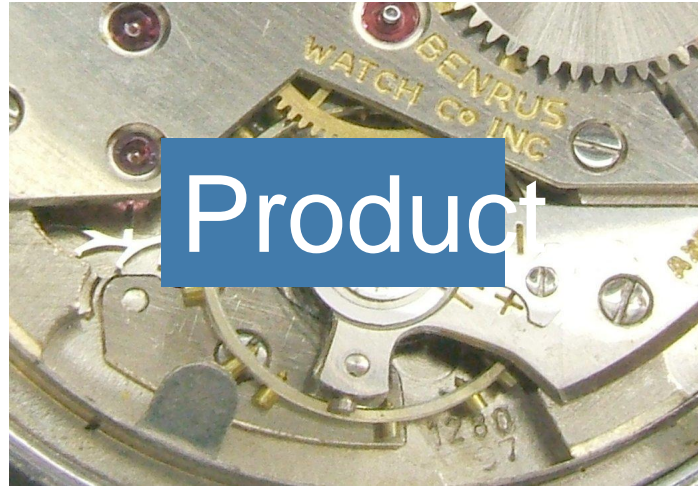


Metric Definition

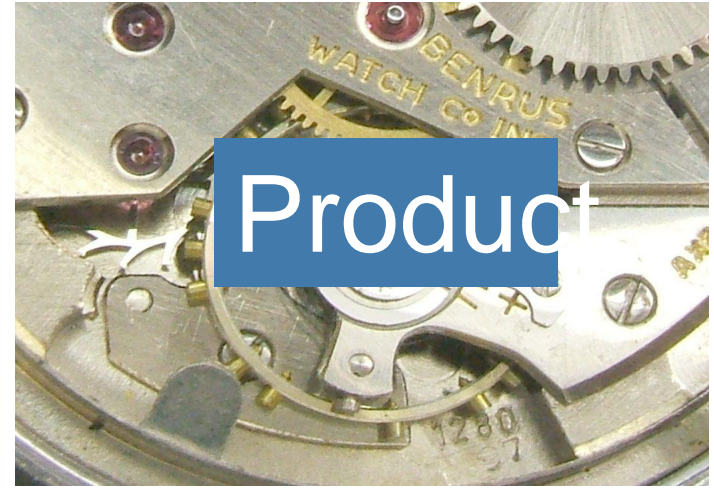
- Goal of the Metric
- Preliminaries
- Calculation Formula
- Meters
- Measurements
- Target Ranges
- Benchmarks



Goals



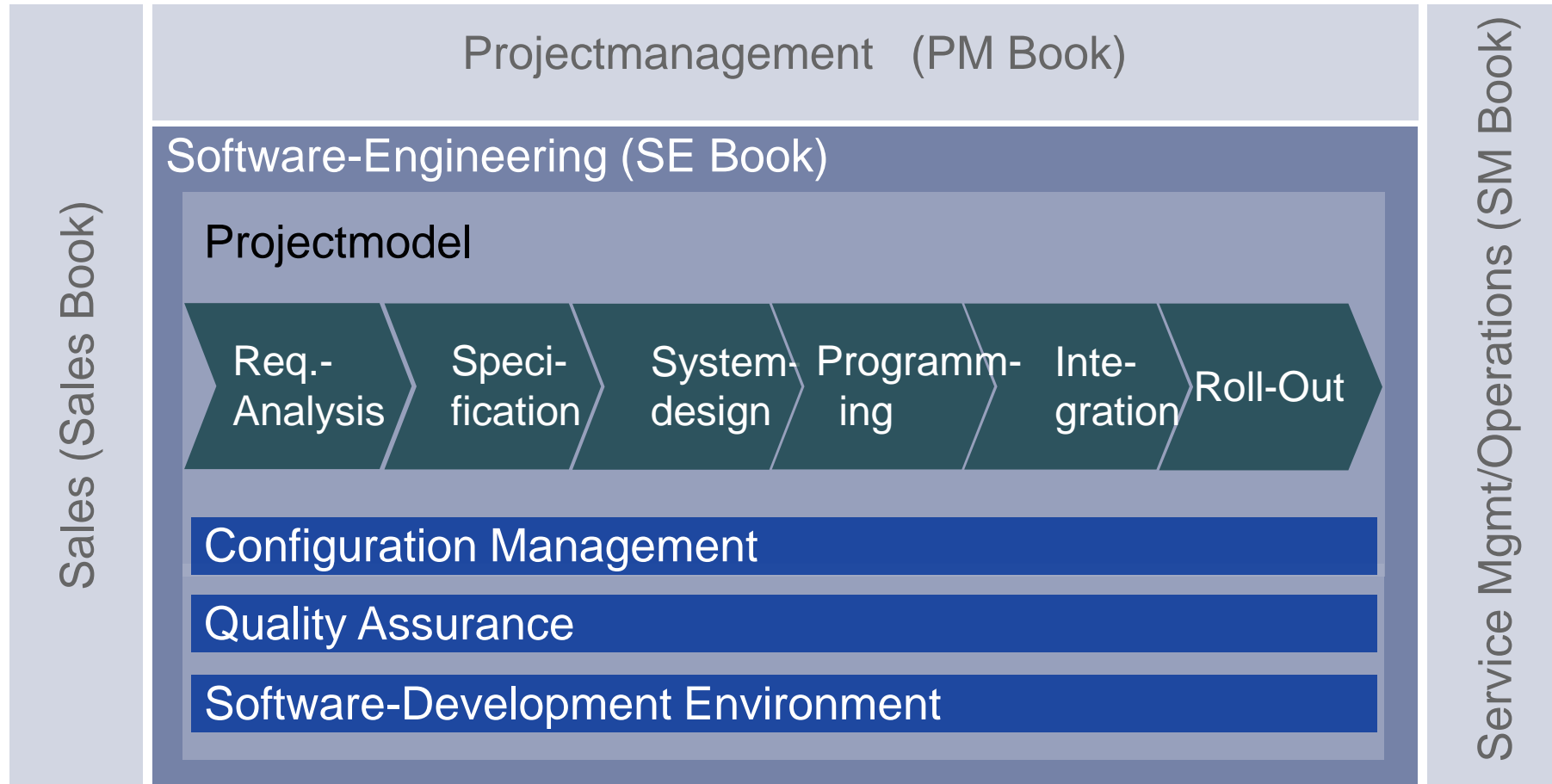
Not one KPI



But only one Meter



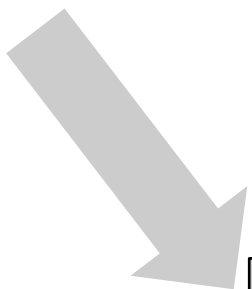
The Software Engineering Process



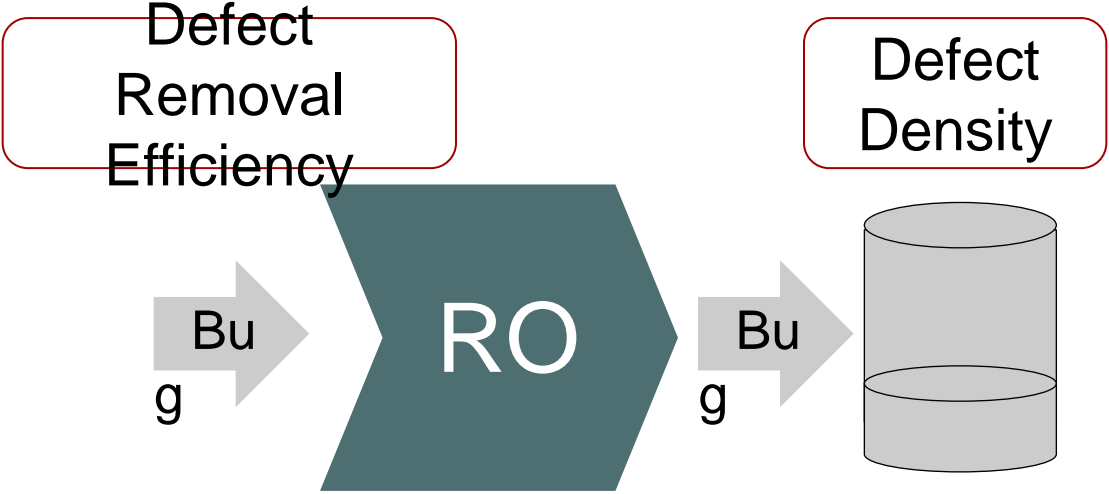
Defect Leakage



Defect Injection



Bug Defect Detection





Process KPI

Defect
Leakage


Defect
Detection

Defect
Injection

SE Book
Conformity

Requireme
nts Stability

Product Quality KPIs

A detailed close-up photograph of a mechanical watch movement. The image shows various gears, jewels, and metal components. A prominent gear in the upper right has the text "CHRYSLER CO. INC." engraved on it. The watch movement is highly intricate, with many small parts and screws visible.

Defect Density
Defect Removal Efficiency

Plausibility Check for Defects

really no requirements defects?

don't we look for source of defect?

Example		Defect Identification (Type of Defect)								
		n/a	PM	Requirement Analysis	Specification	System Design	Programming	Integration	Roll-Out	Operation
Cause of Defect	n/a	0	0	0	0	0	1	350	2	6
	PM	0	0	0	0	0	0	0	0	0
	Requirement Analysis	0	0	0	0	0	0	1	0	2
	Specification	0	0	0	30	0	0	1	0	3
	System Design	0	0	0	0	50	1	0	0	2
	Programming	0	0	0	0	0	16	200	2	37
	Integration	0	0	0	0	0	0	14	200	2

why no defects from predecessor phases?

why so little programming defects?

really programming defects?

why so many integration defects?



Intermediate Summary

We can measure process and product quality with different KPIs based on a single meter, that comes virtually for free!

We can validate the quality of the KPIs based on the input data!



Software Craftsmanship

Software

Development is

Development

Not Production



Code Readability

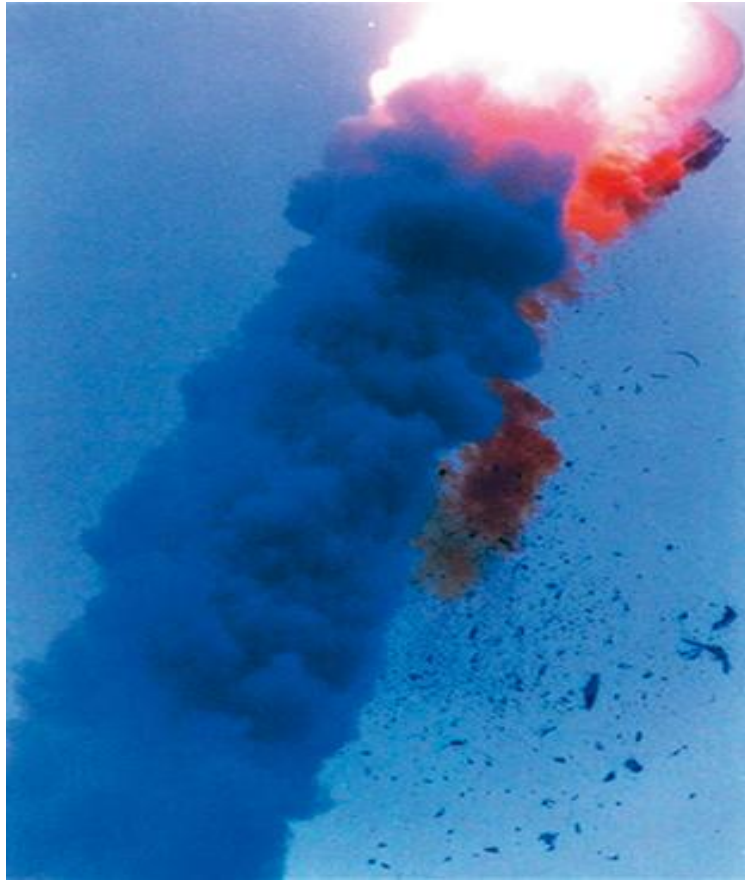


Coding Guidelines

Commentary Density

Code Duplication

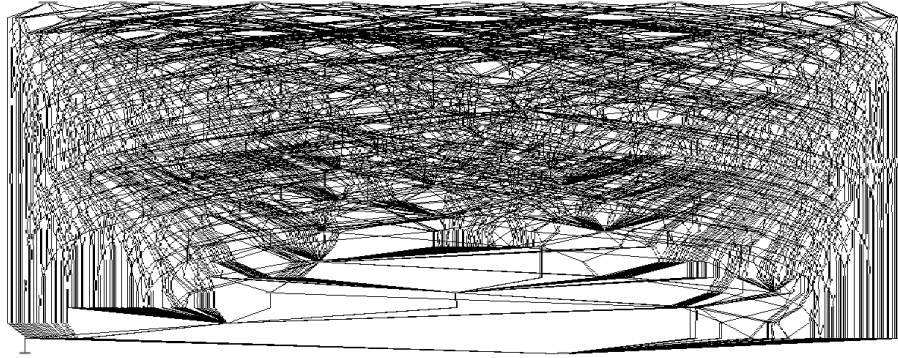
Code Quality



Test Coverage
Successful Tests

T

Code Complexity



Cyclomatic Complexity

Size (SLoC)

CK Metrics

DIT, NoC, RfC, CbO

How To Deploy

- Define Rules (easiest first)
- Define Thresholds
- Select a set of tools
- Enforce Tests
- Measure
- Improve



thank you