

# Measuring the Quality of the Software Engineering Process

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# T-Systems Systems Integration

## Delivery Portfolio

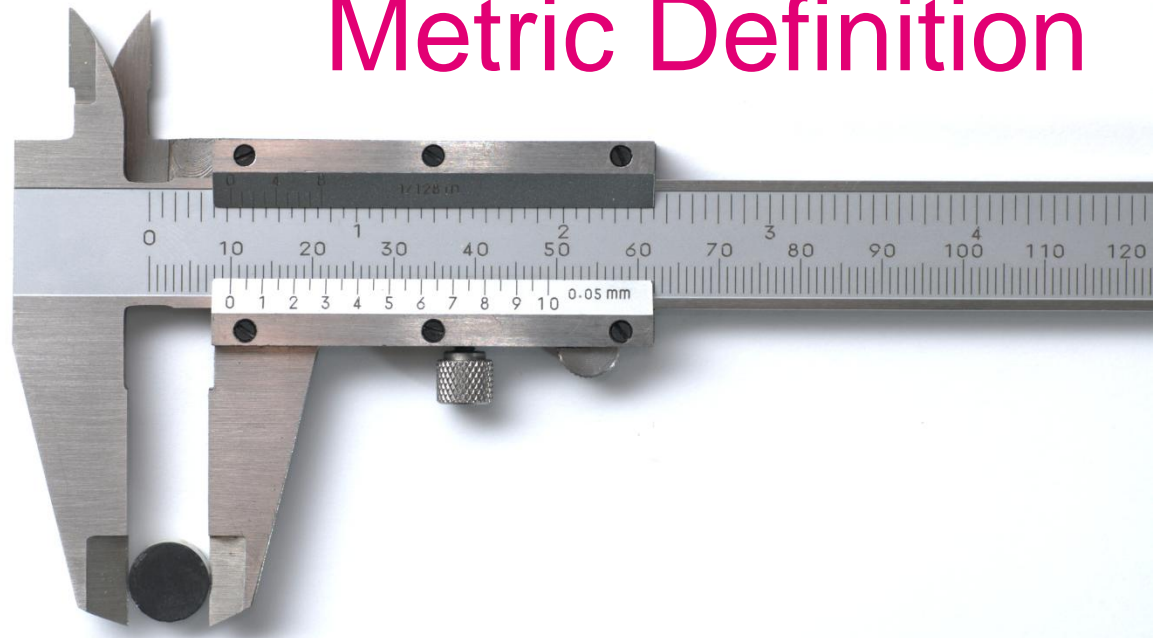


- Telecommunication
- Automotive
- Travel, Transport & Logistics
- Aerospace/Defense/Security
- Public
- Other Discrete Manufacturing Industry
- Healthcare
- Horizontals

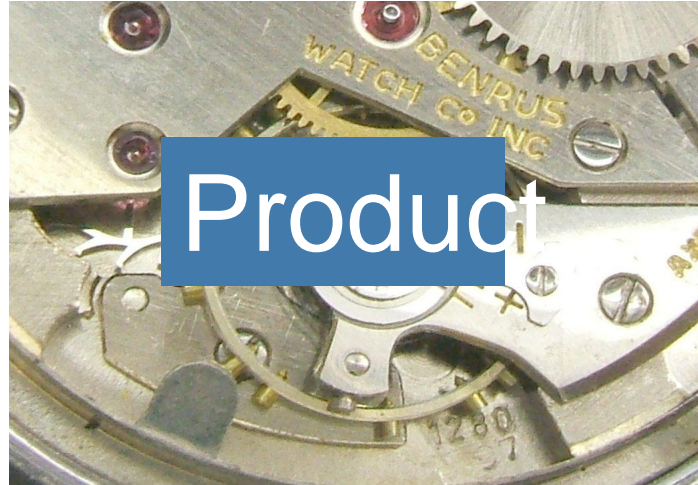


# Metric Definition

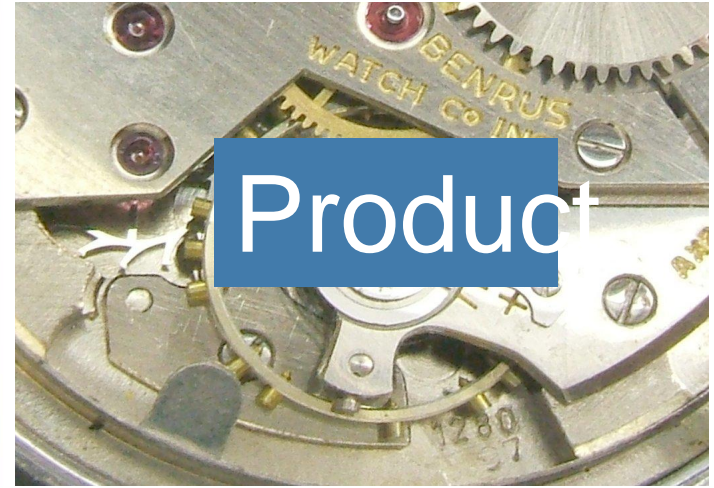
- Goal of the Metric
- Preliminaries
- Calculation Formula
- Meters
- Measurements
- Target Ranges
- Benchmarks



# Goals



# Not one KPI

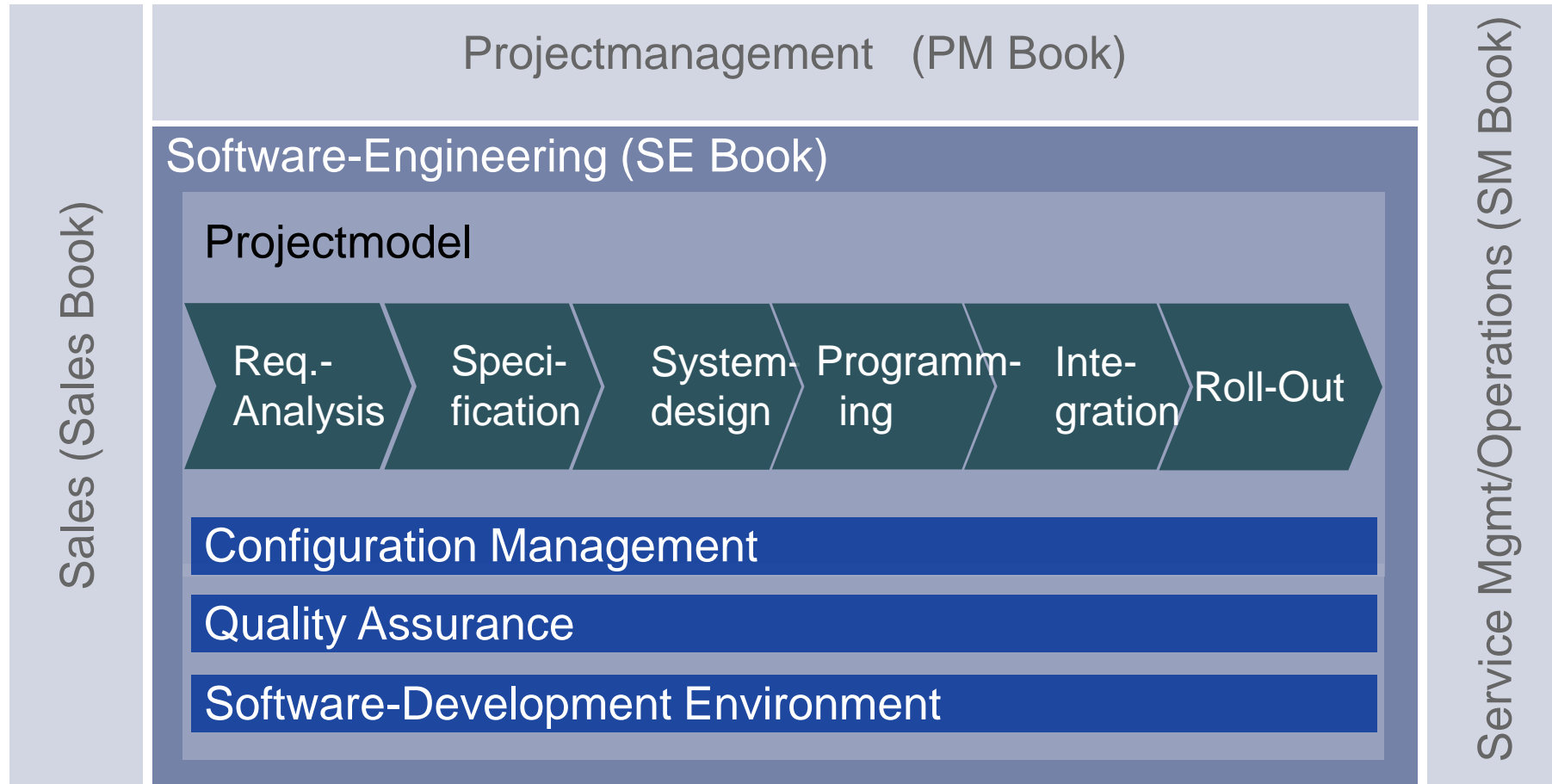




But only one Meter



# The Software Engineering Process



Defect Leakage

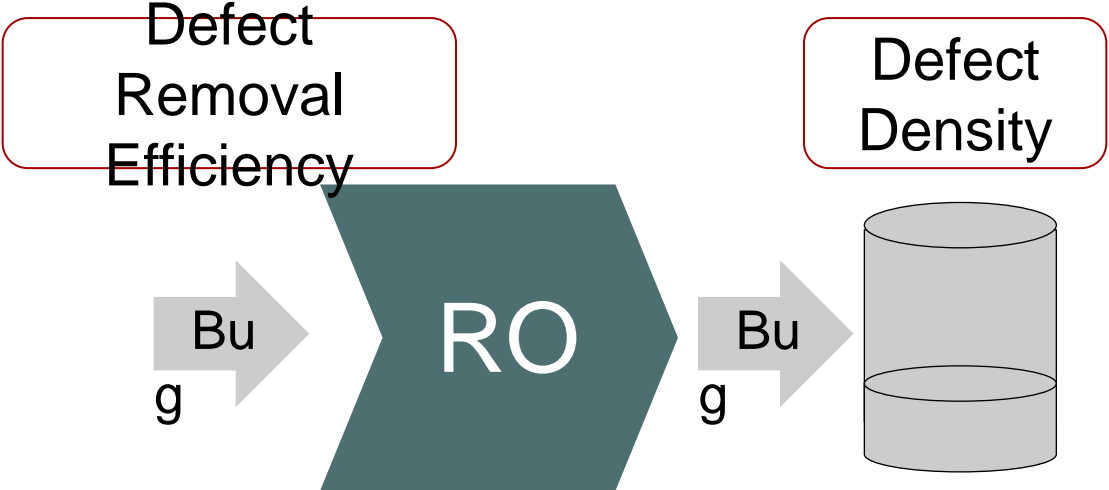


Defect Injection



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, including a large brass gear at the top and a smaller one in the center. Several red jewels are visible, set in metal housings. The metal plates are engraved with text, including 'CHRYSLER' and 'CO INC'. The overall appearance is that of a precision-engineered mechanical assembly.

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

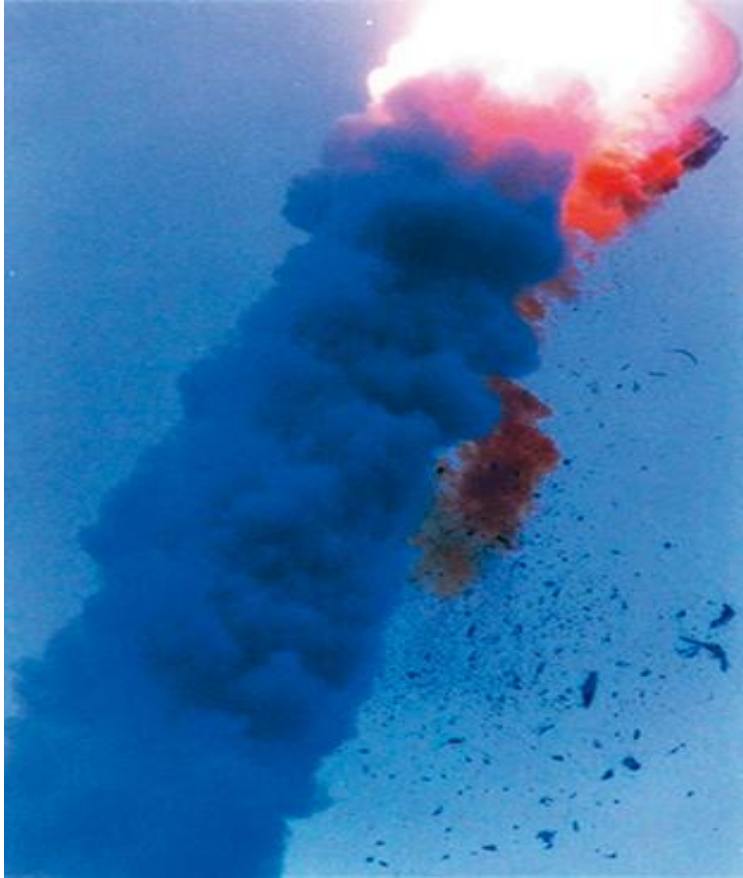


Coding Guidelines

Commentary Density

Code Duplication

# Code Quality

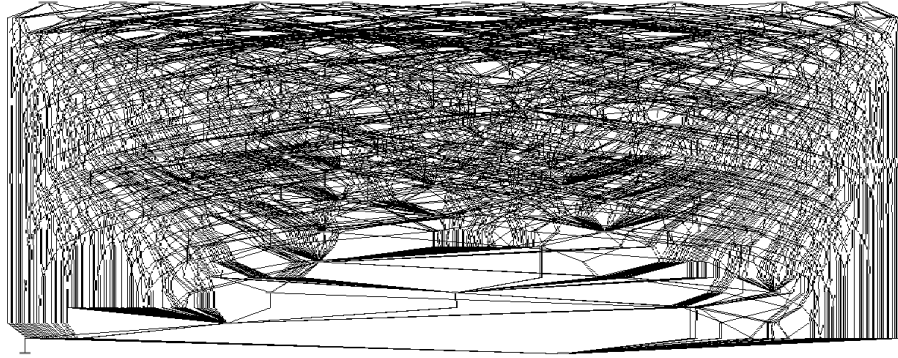


Test Coverage  
Successful Tests

T

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# 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