

# Benchmarking agile software development

— Harold van Heeringen

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WITH THE  
FACTS.**

**IWSM** MENSURA

HAARLEM 7-9 OCTOBER 2019

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# Introducing me

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Drs. Harold van Heeringen

Graduated in Business economics at the University of Groningen in 1997

>20 years experience in IT, **>15 years in software measurement and metrics**

Married, 3 kids, living in Veendam (North of the Netherlands)

**Hobbies** – Chess, soccer and software metrics:

**METRI** – Consultant Estimation & Performance Measurement

**NESMA** – Board member International cooperation and partnerships

**ISBSG** – Immediate Past President (2011-2019)

**COSMIC** – Dutch representative in the International Advisory Council (IAC)

**ICEAA** – Trainer of CEBok chapter 12: Software Cost Estimation

**sCEBoK** – initiator and module developer



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[www.nesma.org](http://www.nesma.org)

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# METRI proposition

## BENCHMARKING & PRICE MODELS

- HR Benchmark
- Connectivity Benchmark
- Application Benchmark
- Infrastructure Benchmark
- BID Support
- IT Service Review
- Application Price Model
- Infrastructure Price Model
- ...

## GOVERNANCE

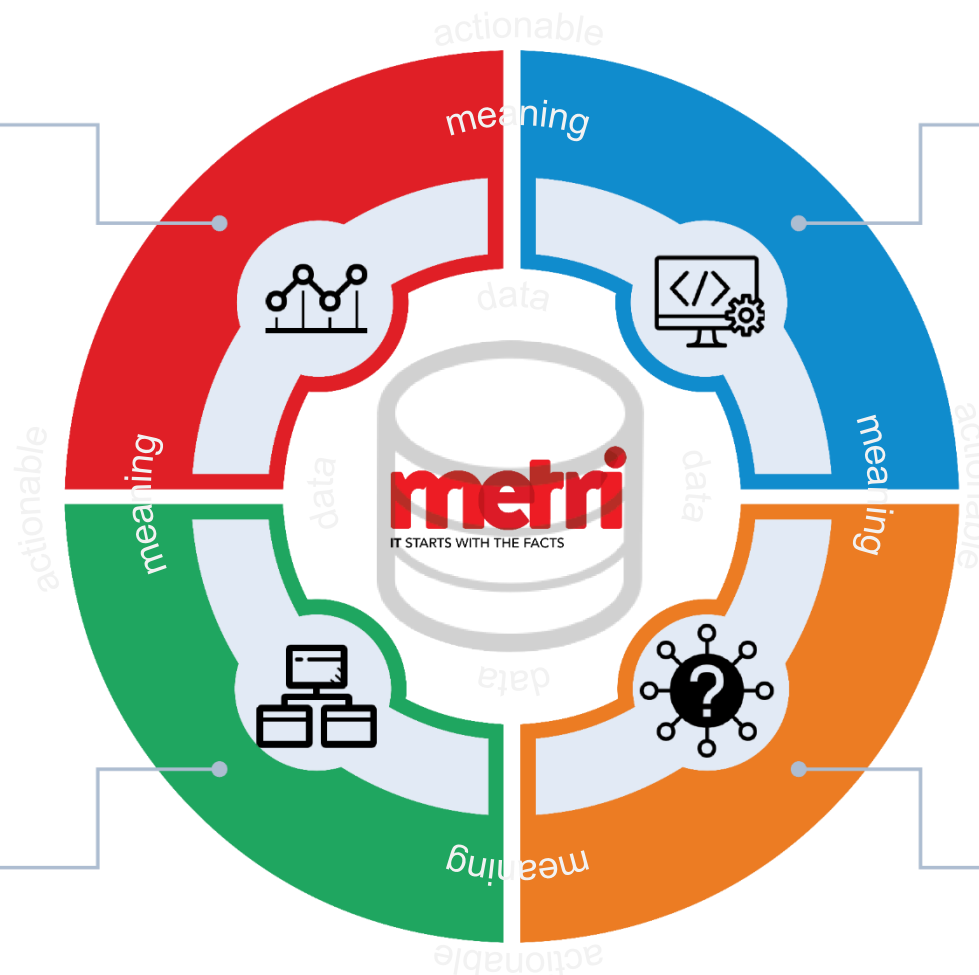
- Demand & Supply Model
- Target Operating Model
- Business-centric IT Operating Model
- Service Management
- OBEYA
- Dashboarding
- ...

## SOFTWARE DEVELOPMENT IMPROVEMENT

- Agile Team Performance Monitor
- Due Diligence Accelerator
- Cloud Strategy Enabler
- Software Risk Monitor
- Supplier Performance Monitor
- IT Cost Estimation
- Agile Team Estimation
- Solution Based Estimation
- ...

## SOURCING

- (European) Tender
- Supplier Selection
- Sourcing Strategy
- Mediation
- Landing Zone
- Value Driven
- ...



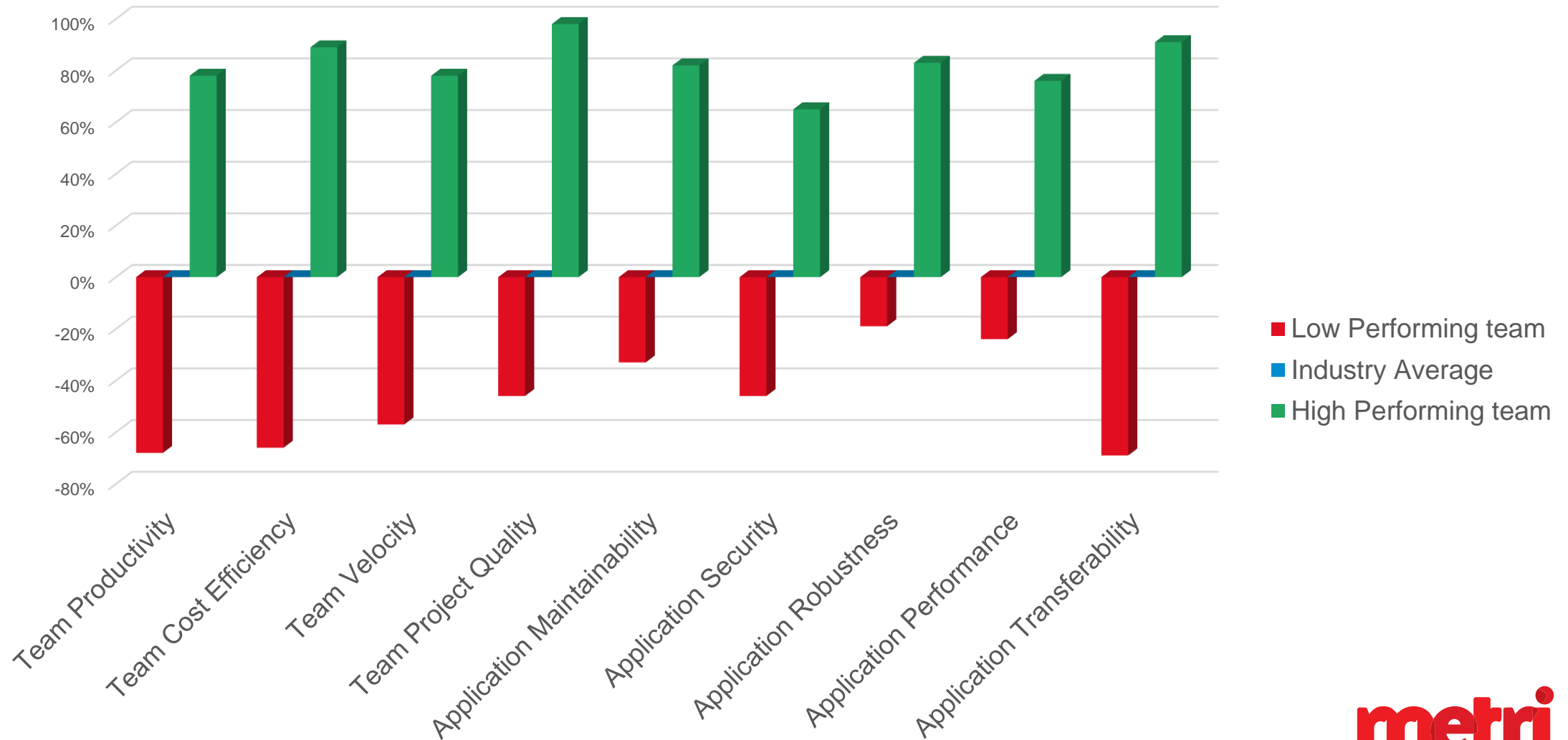
# Low industry Performance Measurement maturity

4

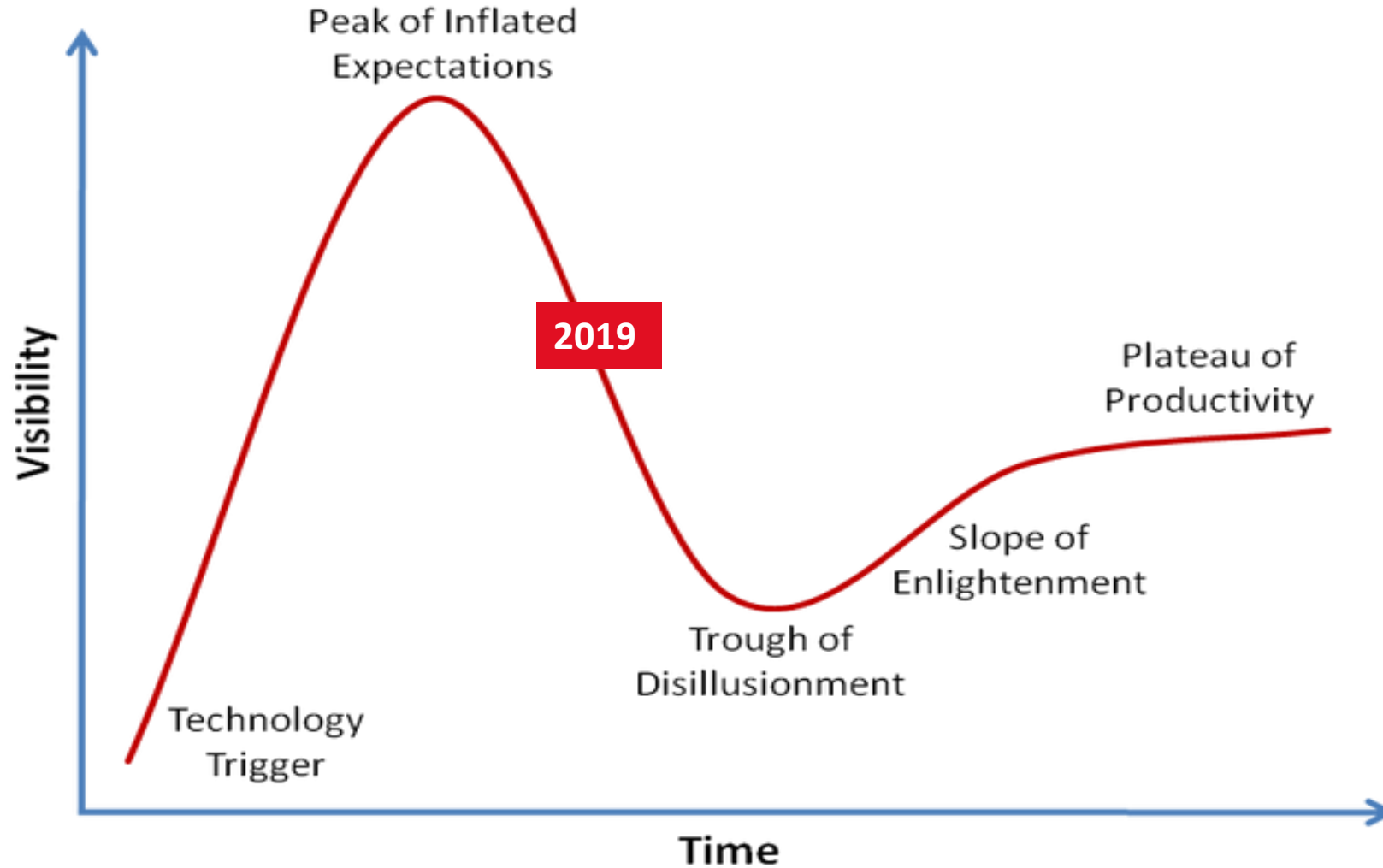


# High Performance Teams – really?

5



# Agile Hypecycle



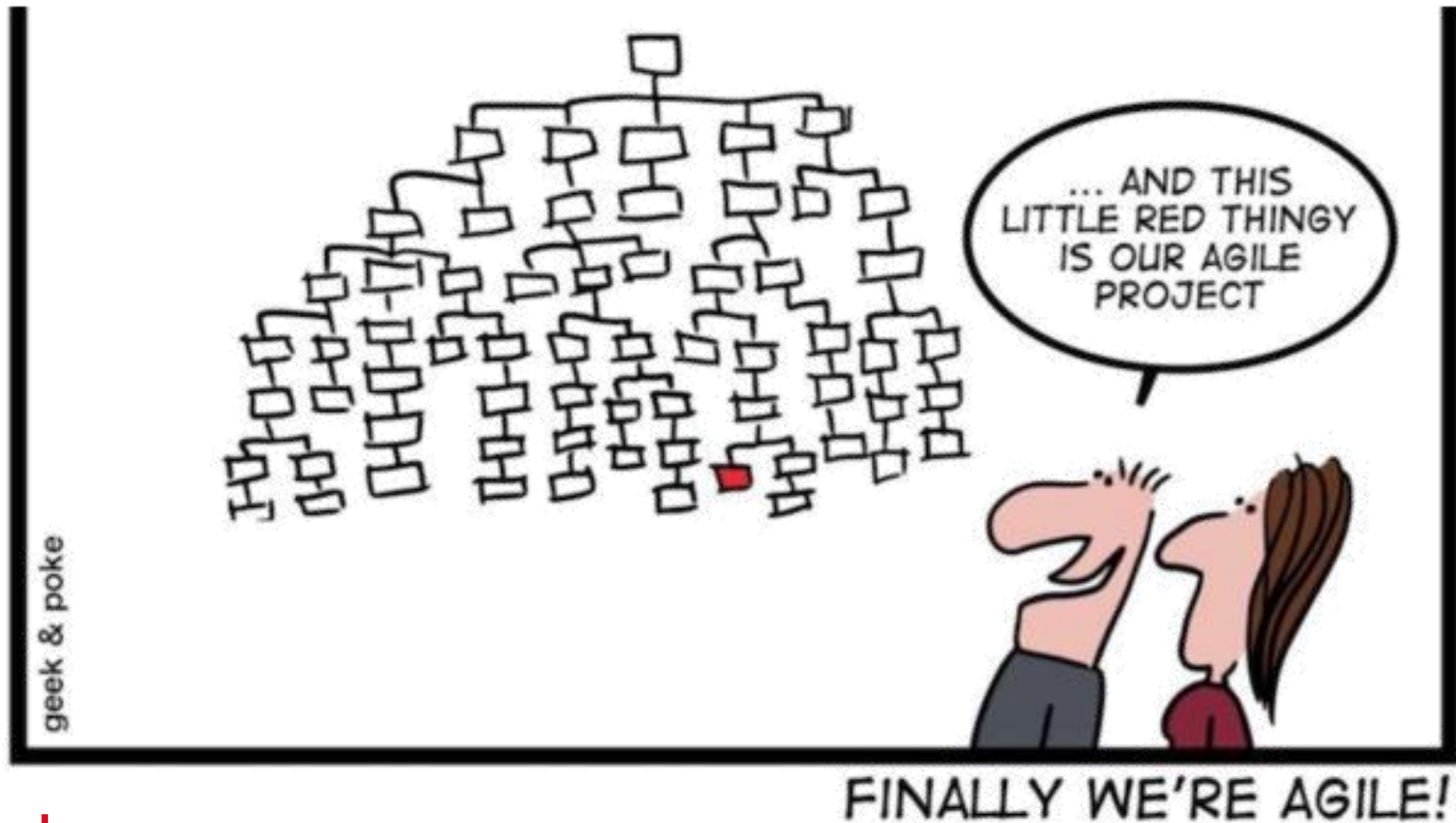
## België scoort slechter

Interne risicorapportages ING,  
score moet onder de 2,5 liggen

ING Nederland			ING België		
IT foundation			IT foundation		
Q I	Q II	Jul '18	Q I	Q II	Jul '18
2,4	2,1	2,2	2,6	2,1	2,5
Platform security			Platform security		
2,6	2,5	2,7	3,0	2,6	2,6
Security monitoring			Security monitoring		
2,6	2,5	2,5	3,3	3,0	3,0
Change management			Change management		
2,4	2,2	2,5	4,0	3,0	3,0
IT resilience			IT resilience		
2,2	2,2	2,2	1,5	2,3	2,3
Identity and access management			Identity and access management		
2,6	2,7	2,5	3,5	2,8	2,7
Cybercrime			Cybercrime		
2,4	2,2	1,8	3,5	1,0	1,0
Score juli 2018			Score juli 2018		
2,3			2,5		

© FD | CM | Bron: ING

# See the big picture





# The industry practice: story points



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# Key metrics for Agile teams

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- Productivity

Effort hours spent

Size of the delivered Software Product

- Cost Efficiency

Team cost

Size of the delivered Software Product

- Velocity

Duration (months)

Size of the delivered Software Product

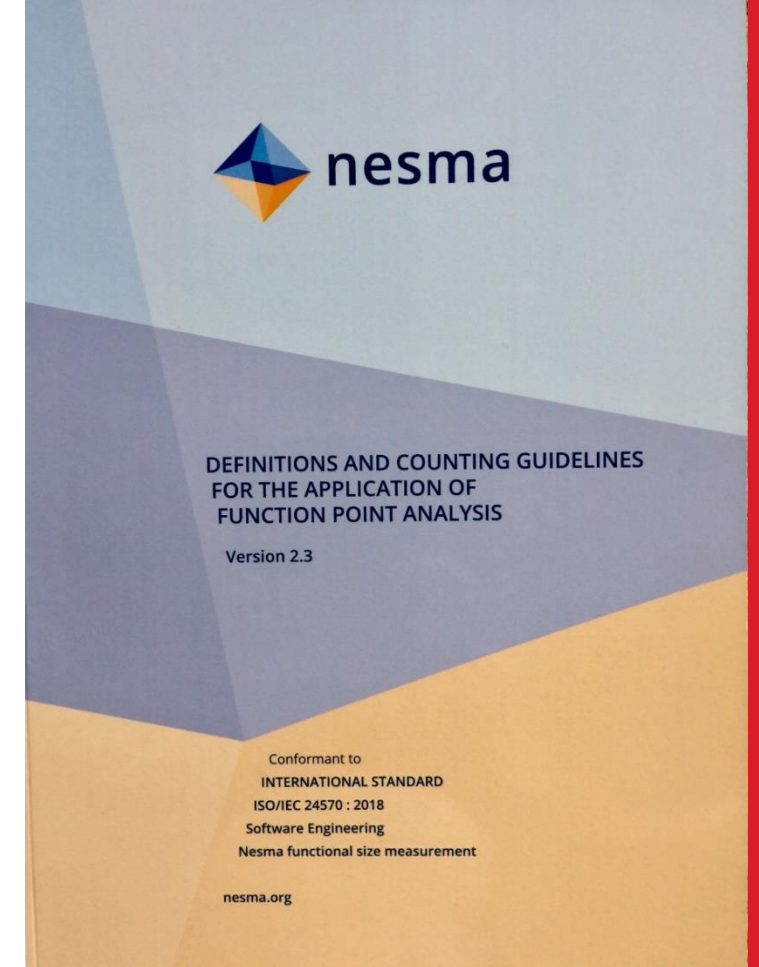
- Product Quality

Defects Delivered

Size of the delivered Software Product

- Code Quality Metrics

Maintainability  
Reliability  
Performance  
Security  
Technical Debt



# Function Points?

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When Agile Teams Think about Function Points

They Imagine This.....

Its **ugly, old, and evil**

It may even eat children!

Something we did in the 80's, and even then it always failed!

But... we also used the meter, the liter, the kilo in the 80's  
And still do...

Function Points measure functionality regardless

- The Technical implementation (e.g. programming language)
- The Implementation method (e.g. Agile)
- Other non-functional requirements (e.g. availability)



# Why not?

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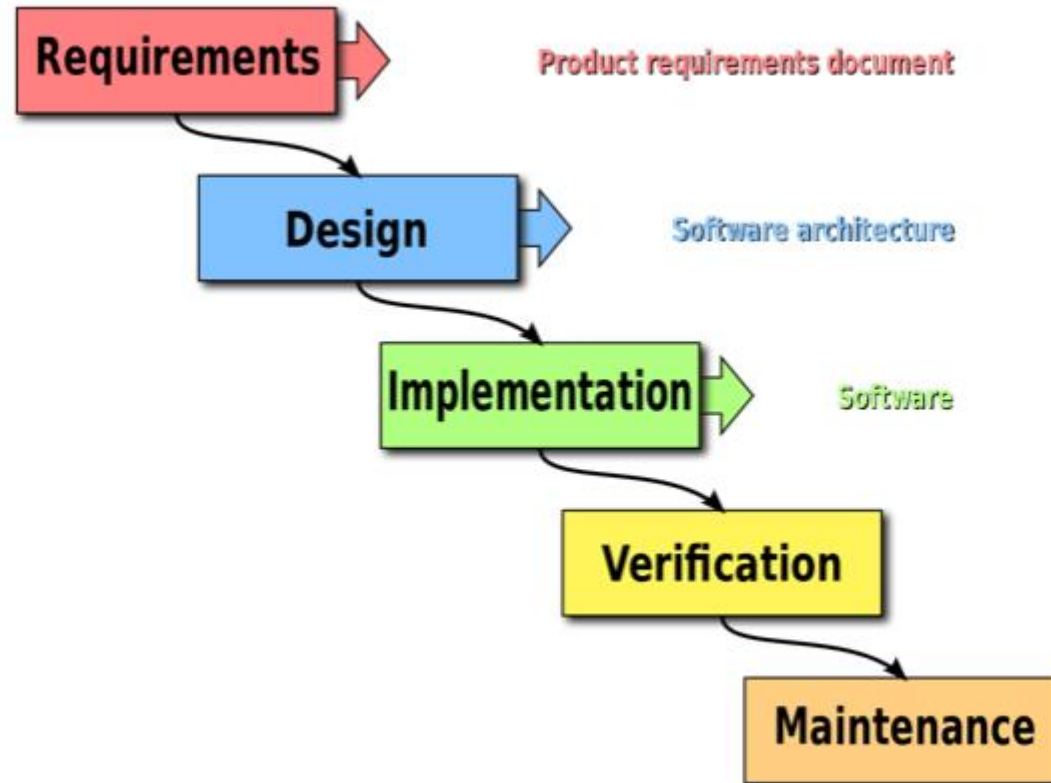
- They see overdocumentation



# Why not?

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- They see over-waterfall



# Why not?

- 13**
- They see a management tool

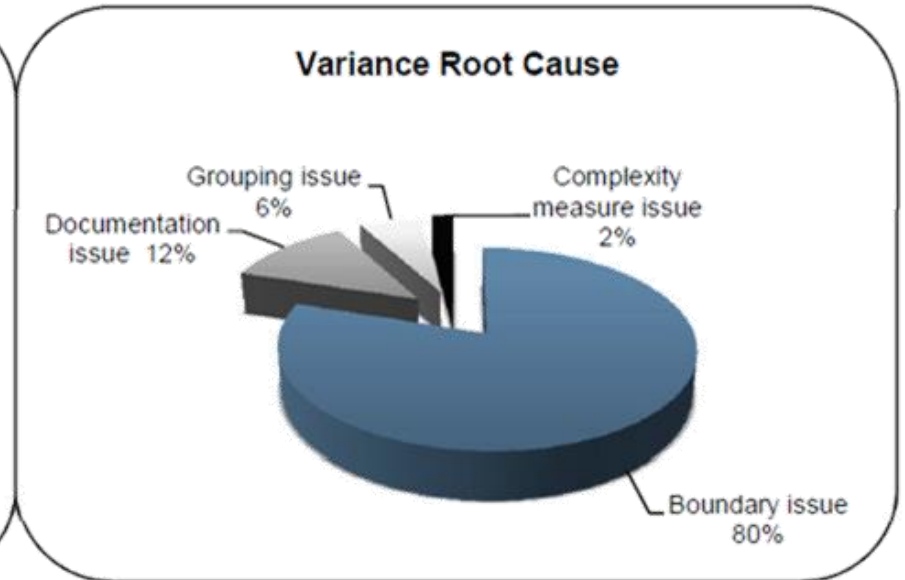
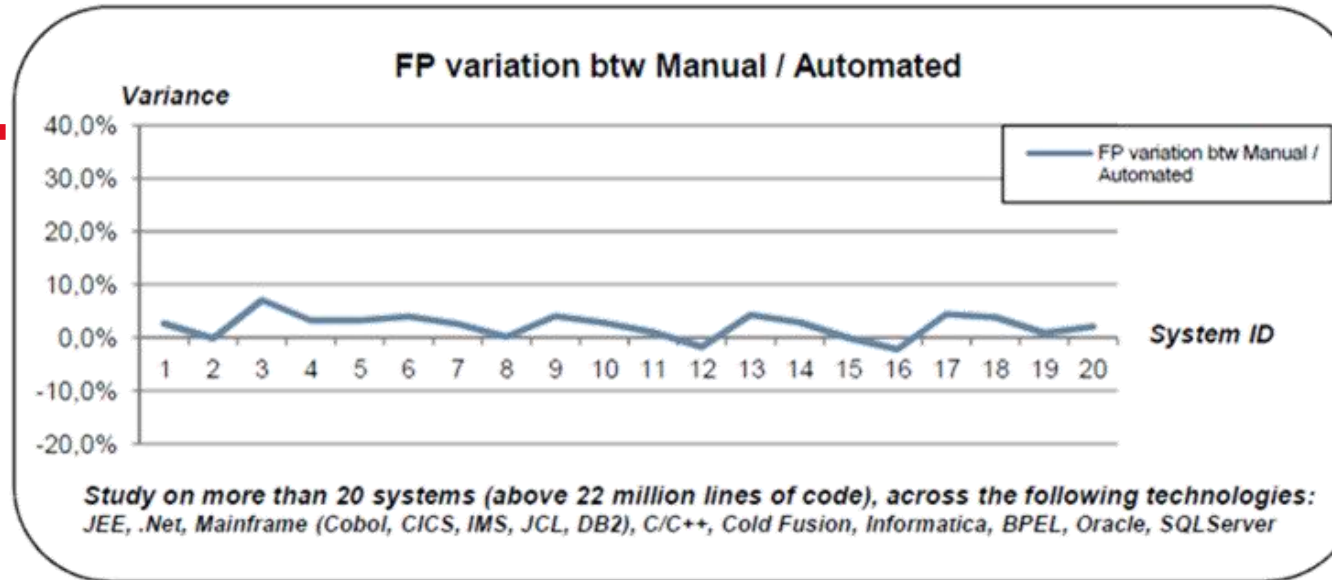




# Automated Function Points

- Implement functional sizing without bothering the teams!

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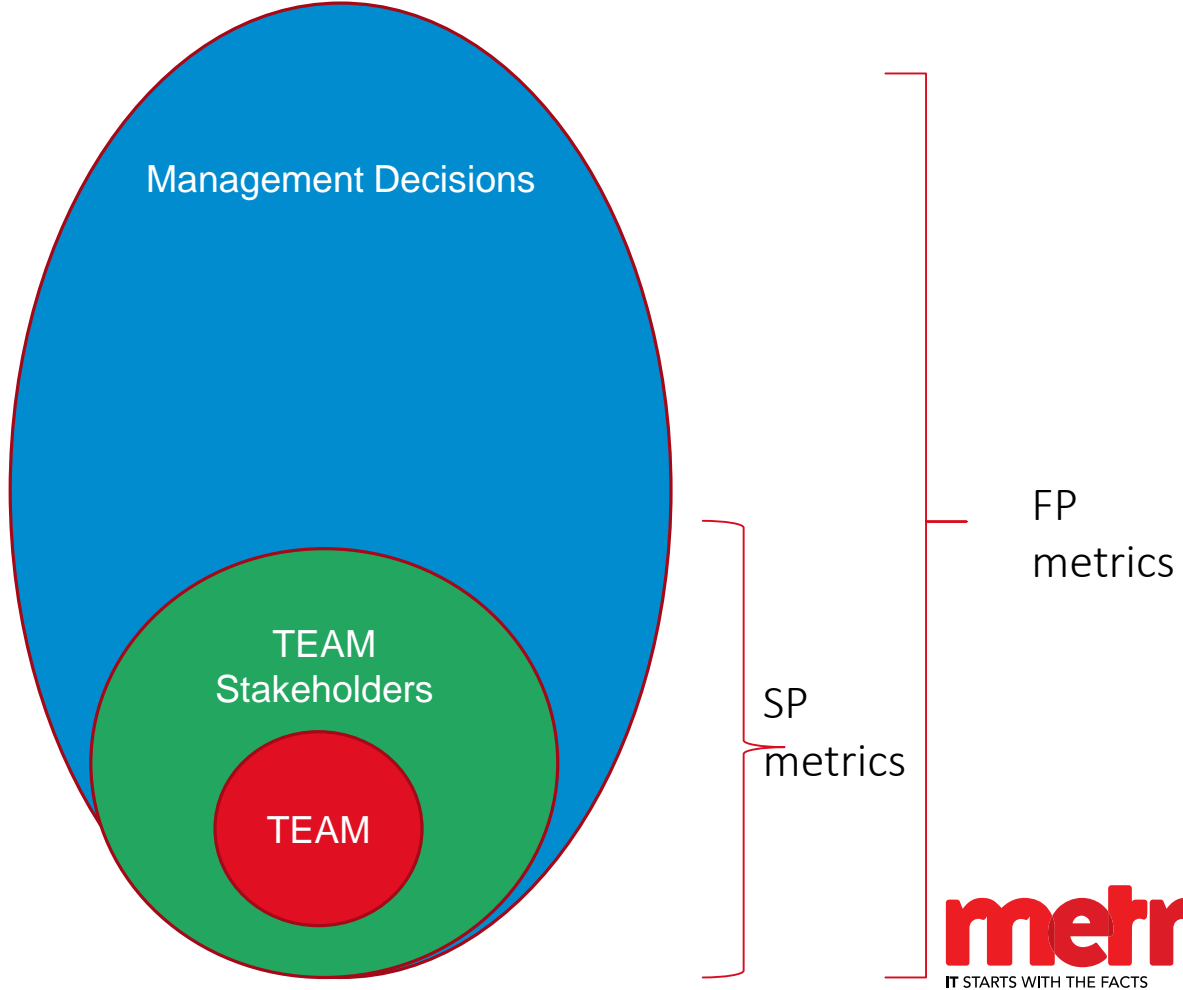
- similar to IFPUG and Nesma FP
- ISO standard - ISO 19515:2019
- OMG/CISQ Standard
- Implement in the CI/CD pipeline of Agile teams
- No waste for the teams, while delivering value for management

# Senior management is responsible and accountable

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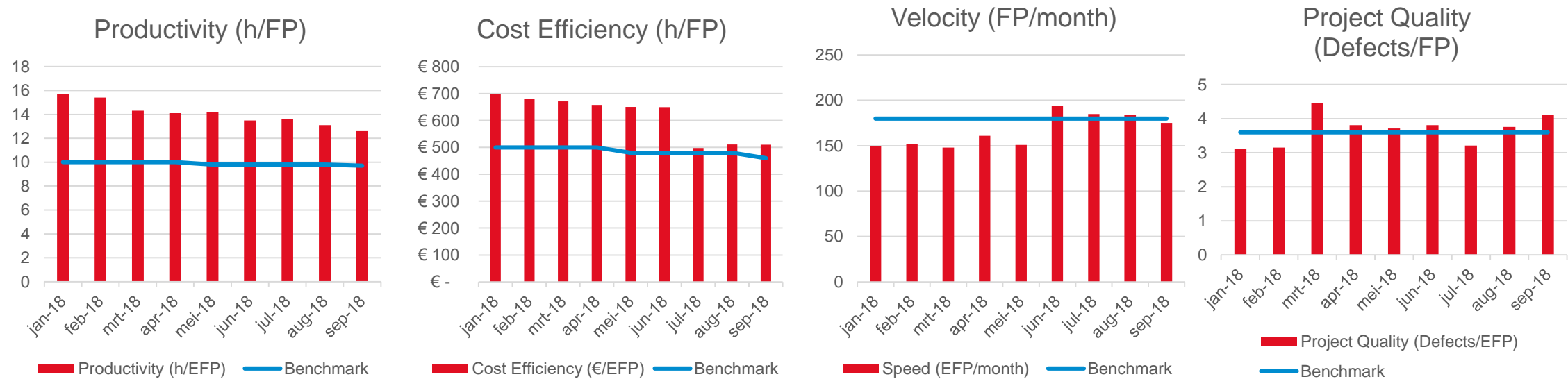
Type of Decision	Measurement	Responsibility
Team size estimation	Function Points	Management
Performance measurement	Function Points	Management
Long term estimation	Function Points	Management
Benchmarking	Function Points	Management
Budgeting	Function Points	Management

Type of Decision	Measurement	Responsibility
Determine backlog priority	Story Points	Product owner
Sprint backlog items	Story Points	Team / product owner
Check progress SBI's	Story Points	Scrum master



# Dashboard

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- Agile Team Performance Measurement, based on standards
- Trends through time
- High performance teams vs. Low performance teams – learn and improve!
- Benchmark! METRI Data engine or ISBSG D&E data repository
- But what about the quality of the product?

# Product Metrics – static code analysis

	Description	Business value
<b>Transferability</b>	Measurement of the effort needed to transfer knowledge and ownership of the application to a new team either external or internal or to integrate new team member in the existing team.	<ul style="list-style-type: none"><li>▪ Avoid to be tied to a internal resource / team or outsourcer</li><li>▪ Improve team productivity</li><li>▪ Ease transfer between contractors, internal teams and outsourcer</li></ul>
<b>Changeability</b>	Effort measurement to implement a fix or a new feature within the application.	<ul style="list-style-type: none"><li>▪ Improved maintenance ease and delays</li><li>▪ Improved predictability of application releases</li><li>▪ Improve time to market</li></ul>
<b>Robustness</b>	Measure the robustness of the application and the risk to introduce instability during code maintenance or development.	<ul style="list-style-type: none"><li>▪ Reduce defects and bugs in production</li><li>▪ Lower the application downtimes</li><li>▪ Improve User Experience</li></ul>
<b>Efficiency</b>	Measurement of the risk of bad performance of the application based on its design and architecture	<ul style="list-style-type: none"><li>▪ Improve response time of the application</li><li>▪ Lower resources needs of the application</li><li>▪ Improve scalability</li></ul>
<b>Security</b>	Measurement of the risk whether an application can have possible security breach and how its data are protected	<ul style="list-style-type: none"><li>▪ Improve security of both the application and the critical business data used</li></ul>
<b>Maintainability (TQI)</b>	Appreciates the cost and ease to globally maintain an application in the future.	<ul style="list-style-type: none"><li>▪ Lower general maintenance costs of the applications</li></ul>

# The total picture

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CISQ

OMG

OBJECT MANAGEMENT GROUP

Software Engineering Institute

## RISK

ROBUSTNESS

2.47

1 2 3 4

Risk of critical failures in production

EFFICIENCY

1.75

1 2 3 4

Risk of performance / scaling issues

SECURITY

1.83

1 2 3 4

Risk of security breaches

## MAINTAINABILITY

CHANGEABILITY

2.59

1 2 3 4

Ease and speed of modifying

TRANSFERABILITY

2.93

1 2 3 4

Ease and speed of learning

Overall application functional size

FUNCTIONAL SIZE

6,998

OMG-Compliant Automated FPs

Performance and productivity

EFP

Added  
Modified  
Deleted

64  
34  
6

104

## PRODUCTIVITY



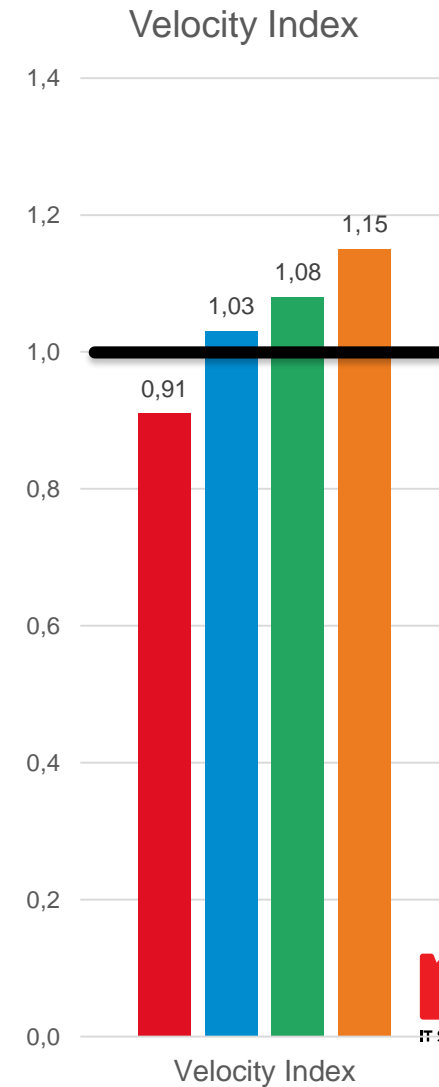
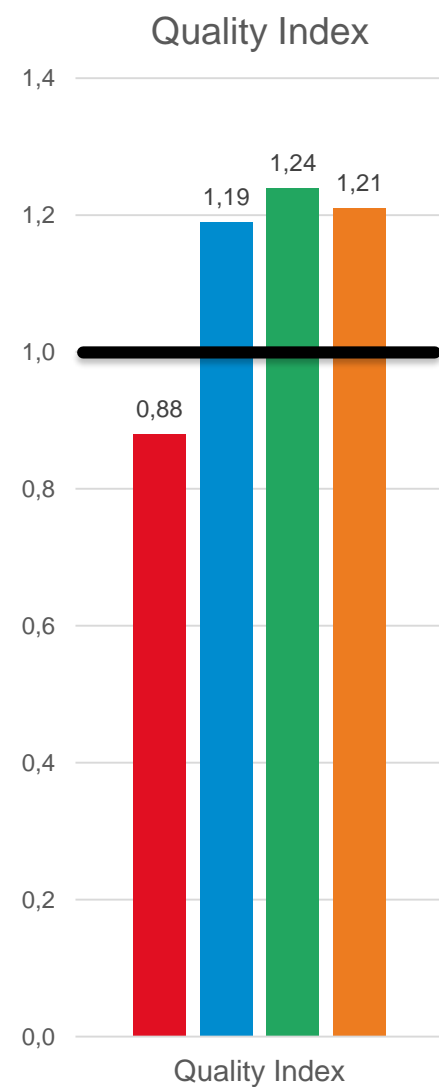
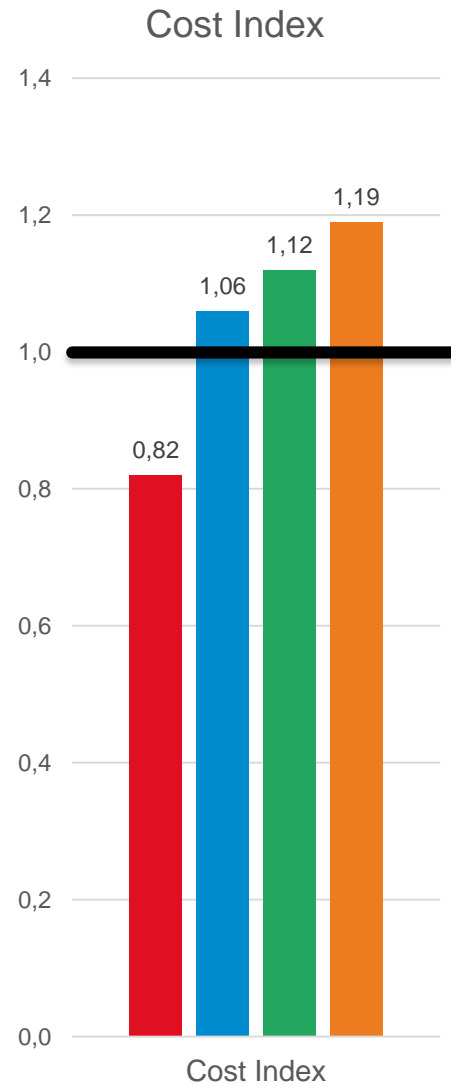
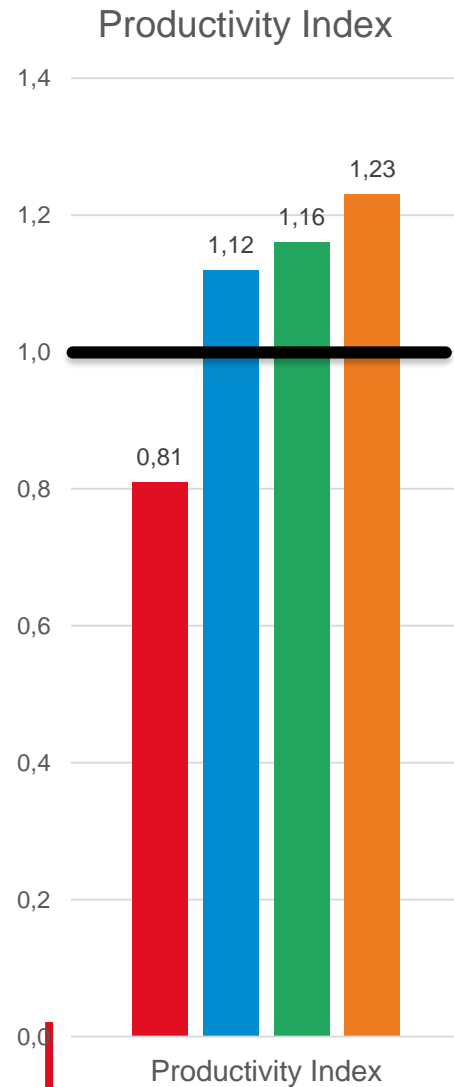
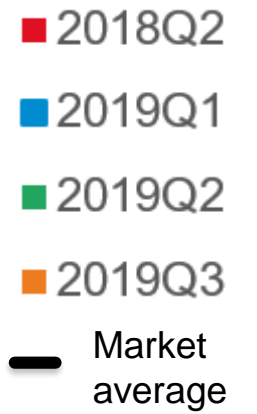
## BENCHMARK



ISO Standards for automated function points



# Practical case



# Product Quality Metrics

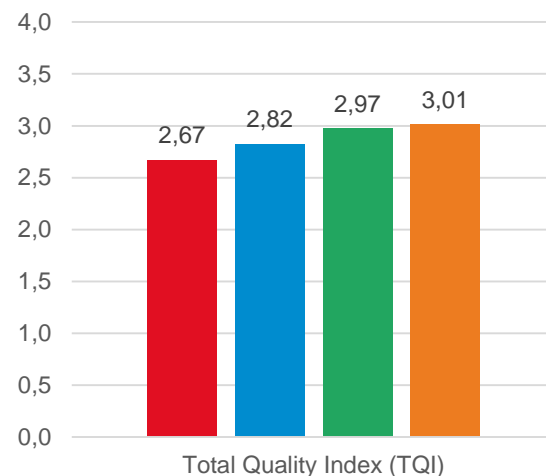
■ 2018Q2

■ 2019Q1

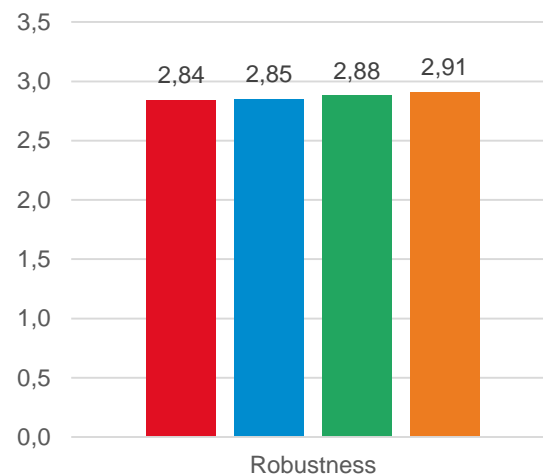
■ 2019Q2

■ 2019Q3

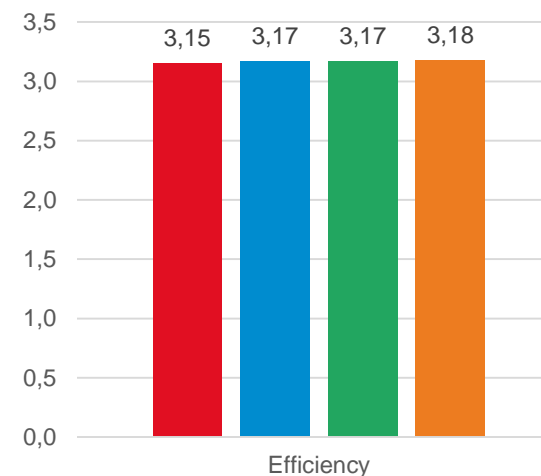
## Total Quality Index (TQI)



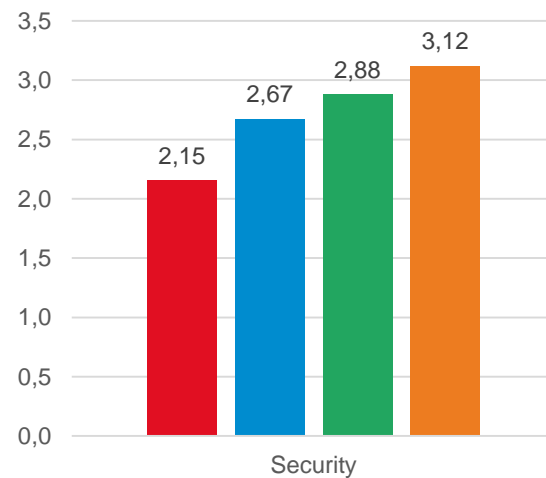
## Robustness



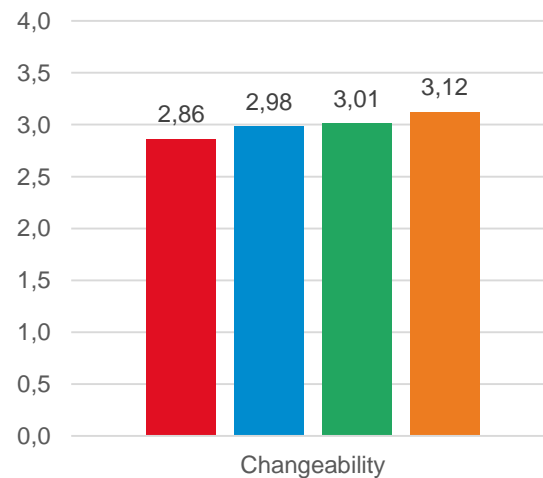
## Efficiency



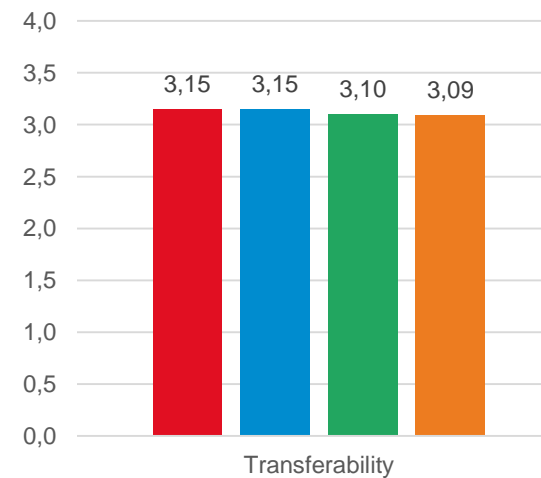
## Security



## Changeability



## Transferability



# Conclusions

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Understand the difference in metrics and the use of metrics

- Team metrics vs Management metrics
- Story Point metrics vs. Function Point metrics

Don't use Story point metrics for management decision making.

Don't use Function Point metrics in the agile team, unless the team sees the value and wants to use them.

Implement manual or automatic functional size measurement **without bothering the teams**

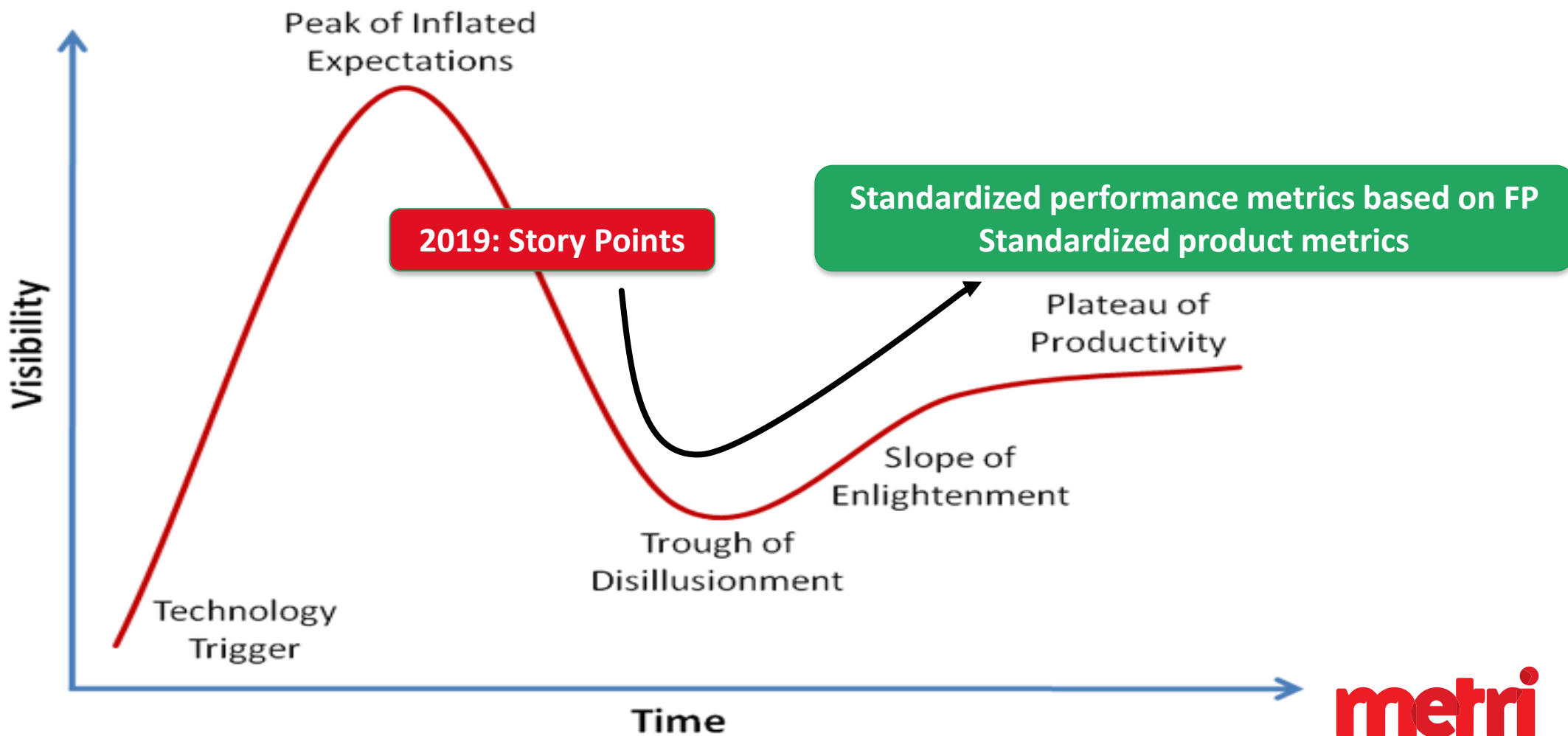
Quality is part of the productivity!

**The goal is not to punish, but always to improve!**



# A bright future!

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