Benchmarking Agile Teams

Use standardized metrics and
Stay in control!

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Introducing me

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 – Principal Consultant and Practice Lead **IT Intelligence**

Nesma – Board member International cooperation and partnerships

ISBSG – Immediate Past President (2011-2019), Board member

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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Nesma: www.nesma.org

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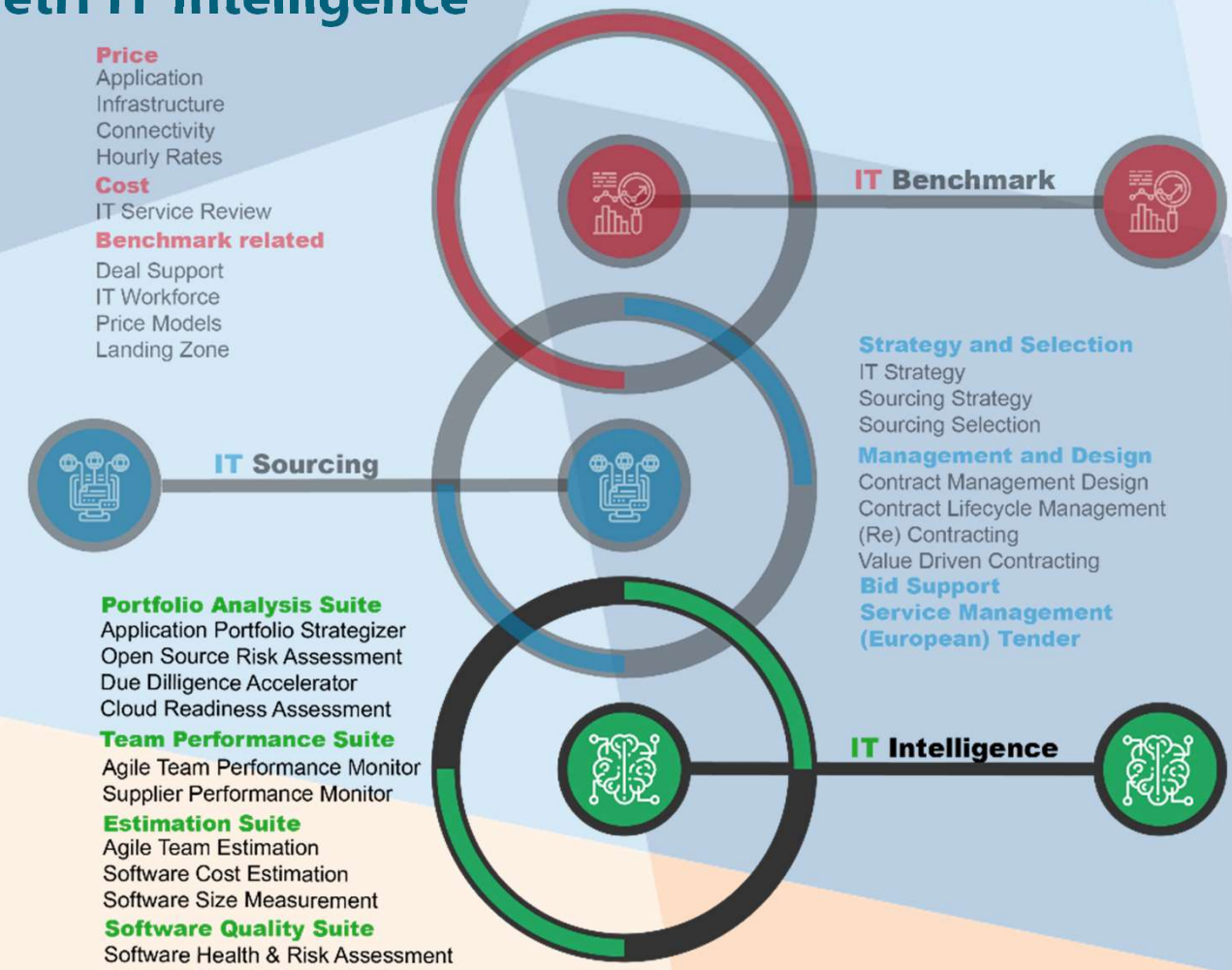
Metri IT Intelligence



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Portfolio Analysis Suite

- Application Portfolio Strategizer
- Open-Source Risk Assessment
- Due Diligence Accelerator
- Cloud Readiness Assessment

Cost Estimation Suite

- Agile Team Estimation
- Software Cost Estimation
- Software Size Measurement

Software Quality Suite

- Software Health & Risk Assessment
- Software Security Assessment
- Software MRI Scan

Team Performance Suite

- Agile Team Performance Monitor
- Supplier Performance Monitor

Challenges in Agile software development

- Decision-making power shifts from management to the self-organizing teams.
- Many teams implement their own system to estimate work (story points), to monitor progress (velocity based on story points) and to check the code (SonarQube).
- This is great on team level, but not great for management purposes.

Management challenge: less grip on the teams, lack of predictability, loss of control.

- Typical challenges:
  - What should be the team size to deliver the Minimum Viable Product on date X?
  - How Productive and Cost efficient are my teams?
  - How does this compare to the market? Do we need to improve productivity?
  - What is the quality and maintainability of the software produced?

- The main reasons these challenges exist:
  - Agile teams use arbitrary effort units (story points), not standards.
  - Measurement for management purposes is considered *waste* on team level.

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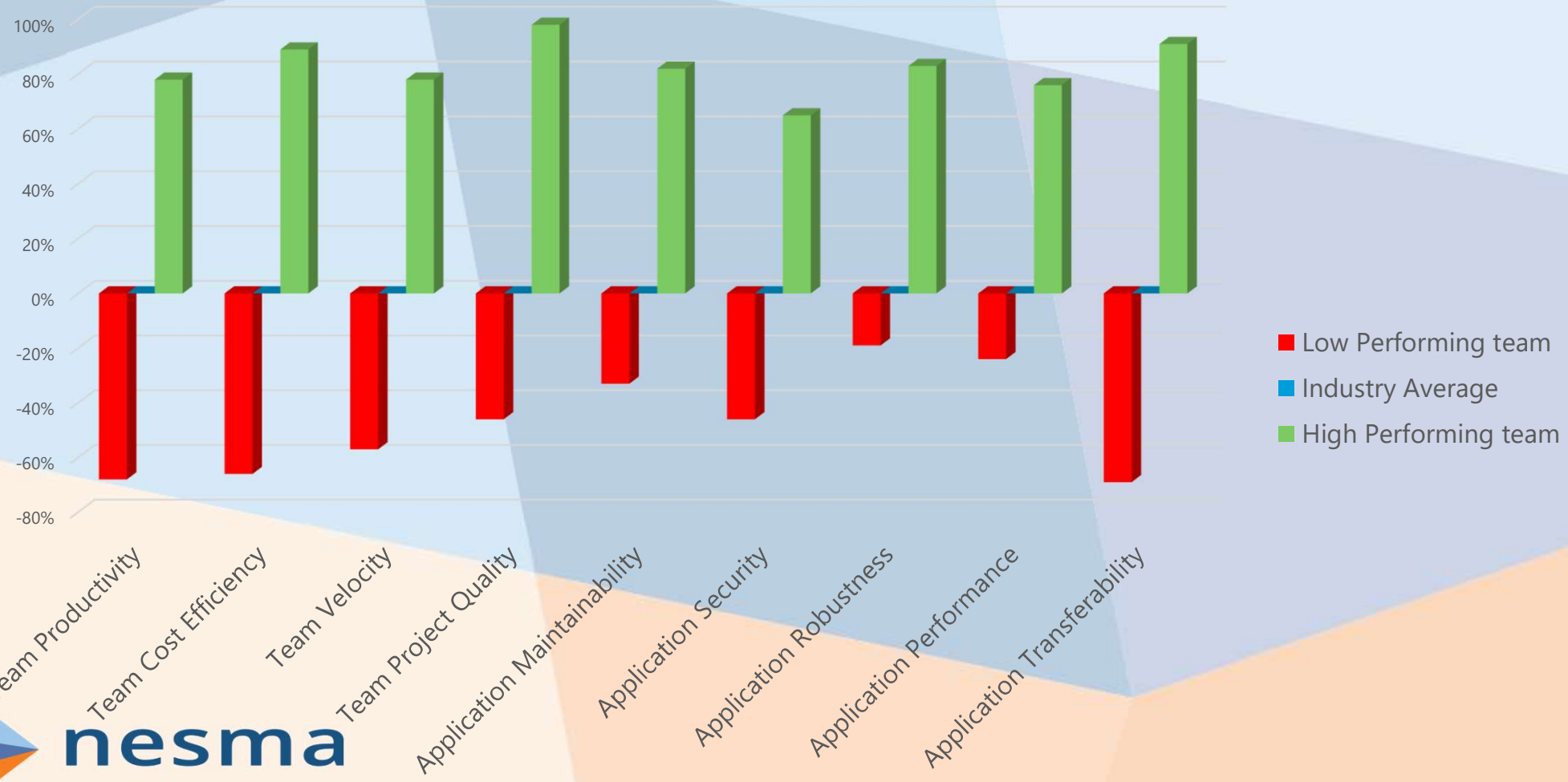
Team Performance in practice



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Software Size

- How much ‘business value’ is created’
- But software is not physical, so how to measure it?
- Many attempts in the past:
  - Lines of Code - not standardized. Ambiguous.
  - Usecase Points - not standardized. Subjective.
  - Complexity Points - not standardized. Subjective.
  - Feature Points - not standardized. Subjective.
  - IBRA points - not standardized. Subjective.

Most recently:

- Story Points - not standardized. Subjective. **Not a measure of size, but effort.**

International standards:

- Nesma function points – **International standard: ISO/IEC 24570**
- COSMIC function points – **International standard: ISO/IEC 19761**
- IFPUG function points – **International standard: ISO/IEC 20926**

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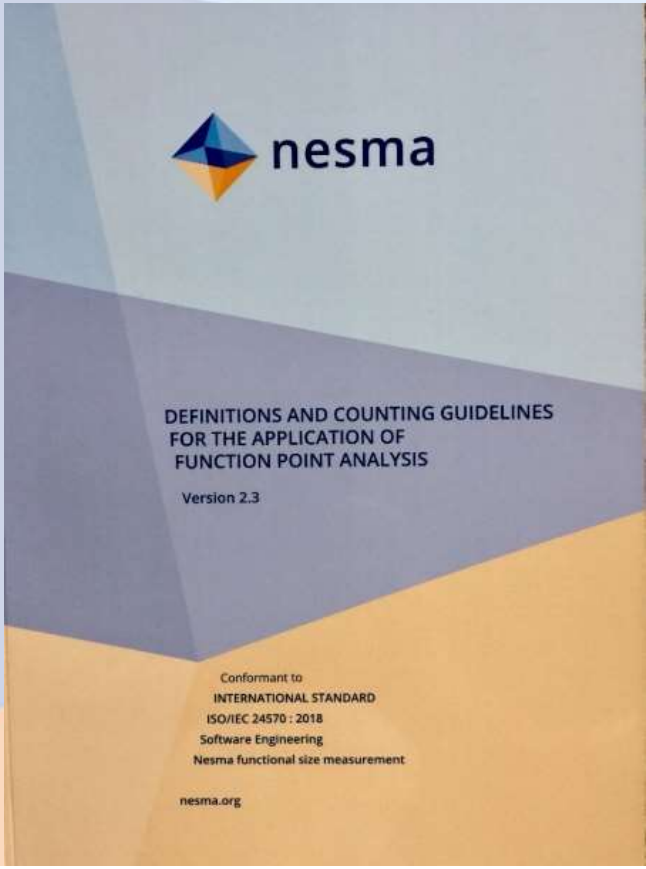

Functional Size Measurement

- Functional Size can be used as proxy for Business Value (More functionality ≈ More Value)

- Can be used early in the project, when functional requirements are known – Product Backlog
- Independent of the technical requirements
- **Objective, verifiable, repeatable, defensible measurement !!**

- Easy to apply to user stories!

- Functional size is the basis for objective software metrics:
  - Productivity (Hours spend per FP)
  - Cost Efficiency (Money spend per FP)
  - Delivery Speed (FP per calendar month)
  - Quality (Defects per 1000 FP)

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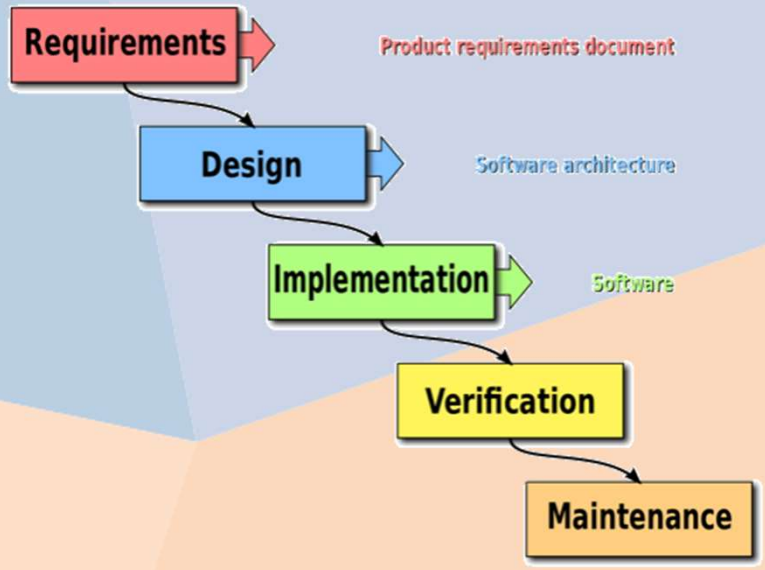
When Agile Teams think about Function Points…



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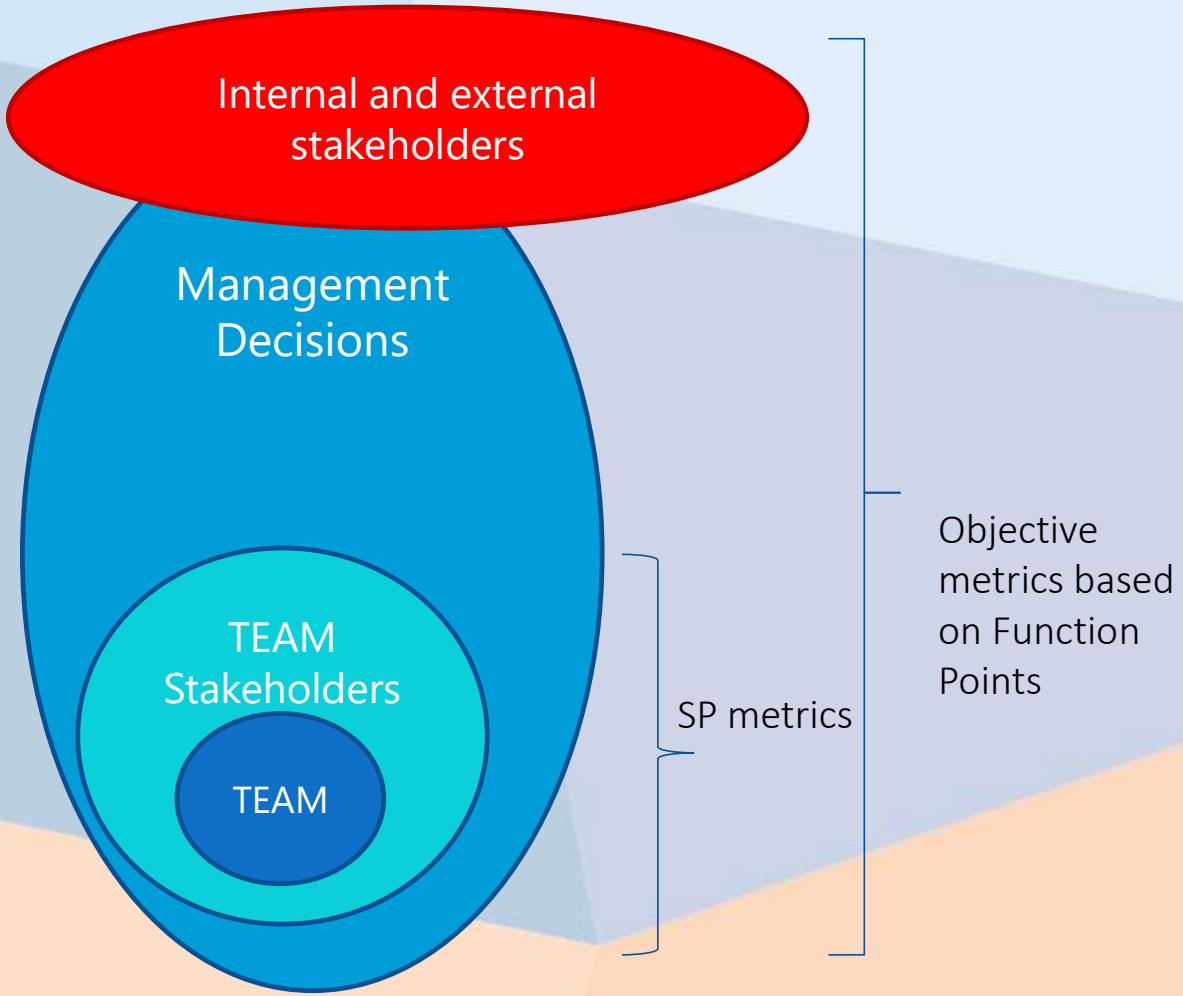
But: Management is responsible and accountable

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
Budgetting	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



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It's all about features and money

High Performing Teams

Must Haves - MVP

Should Haves

Could Haves

12 SP/month

100 FP/month

Industry **Average** Teams

Must Haves - MVP

Should Haves

18 SP/month

50 FP/month

Low Performing Teams

Must Haves

22 SP/month

20 FP/month

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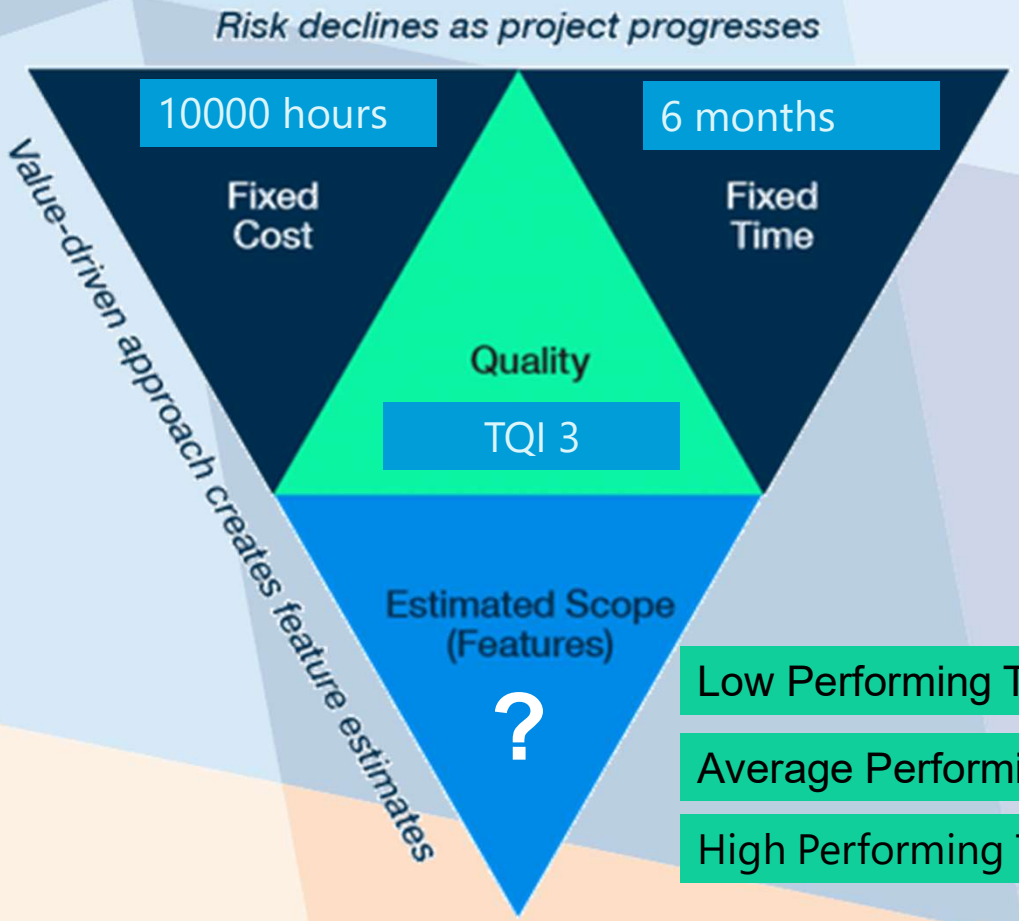
Agile Team Estimation

750 FP

250 FP

500 FP



Low Performing Team:	20 h/FP –	**500 FP**
Average Performing Team:	12,5 h/FP –	**800 FP**
High Performing Team:	10 h/FP –	**1000 FP**

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ISBSG Developments & Enhancements

ISBSG Delivering IT Confidence

D&E Corporate Release August 2020

9592 rows

ISBSG Project ID	Rating: Data Quality Rating	Rating: UFP rating	Software Age: Year of Project	Major Grouping: Industry Sector	Major Grouping: Organisation Type	Major Grouping: Development Type	Major Grouping: Language Type	Major Grouping: Primary Programming Language	Major Grouping: Count Approach	Sizing: Functional Size	Sizing: elative Si	Effort: Normalised Work Effort Level 1	Productivity: Normalised Level 1 PDR (ufp)
10317	B	B	2015	Government	Government;	Enhancement	4GL	.Net	NESMA	8	XXS	816	102
10600	B	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	54	S	608	11,3
10834	A	B	2016	Government	General;	Migration	3GL	Java	NESMA	167	M1	2643	15,8
12499	A	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	75	S	641	8,5
12931	A	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	159	M1	596	3,7
13571	A	B	2016	Government	Government;	New development	4GL	Oracle	NESMA	66	S	241	3,7
13656	B	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	149	M1	708	4,8
13826	A	B	2016	Government	Government;	New development	4GL	Oracle	NESMA	90	S	238	2,6
14550	A	B	2016	Government	Government;	New development	3GL	C#	NESMA	192	M1	3814	19,9
14721	B	B	2015	Government	Government;	Enhancement	4GL	.Net	NESMA	188	M1	3969	21,1
14803	A	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	86	S	720	8,4
15059	A	B	2016	Government	Government;	New development	4GL	Oracle	NESMA	82	S	198	2,4
15251	A	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	59	S	548	9,3
15346	A	B	2015	Government	Government;	Enhancement	4GL	.Net	NESMA	14	XS	716	51,1
16148	A	B	2016	Government	Government;	Enhancement	3GL	Java	NESMA	161	M1	494	3,1
16550	A	B	2016	Government	Government;	New development	4GL	Oracle	NESMA	77	S	283	3,7
16565	A	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	289	M1	511	1,8
17224	A	B	2015	Government	Government;	Enhancement	3GL	Java	NESMA	113	M1	3097	27,4
17722	A	B	2015	Government	Government;	Enhancement	3GL	Java	NESMA	257	M1	3657	14,2
18667	B	B	2015	Government	Government;	Enhancement	4GL	Oracle	NESMA	216	M1	630	2,9

> 9500 projects, releases and (series of) sprints
> 250 project attributes

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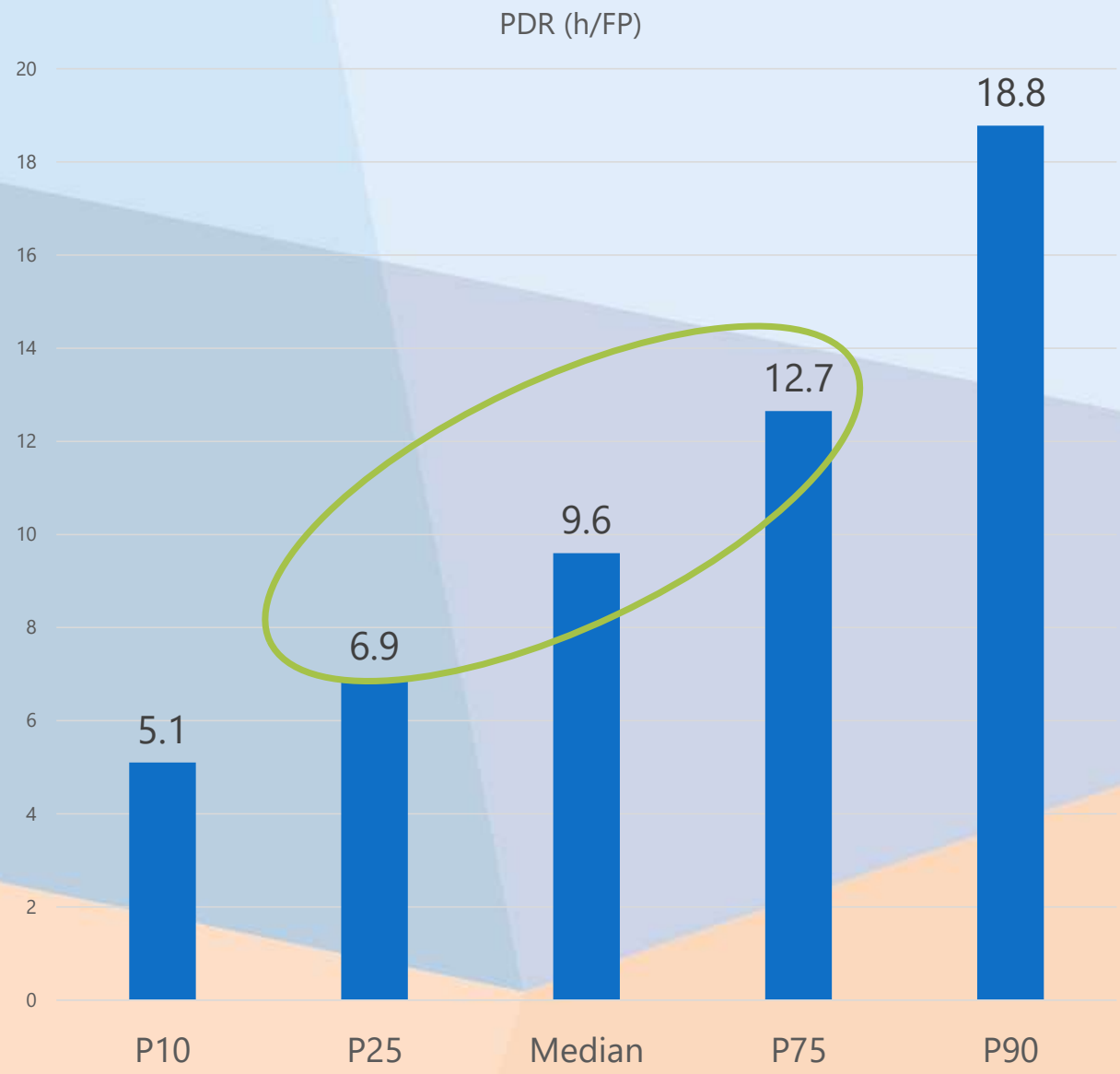
Example Benchmark

Select Peer Group

- Data Quality: A or B
- Year of Project > 2015
- Project Type: Enhancement
- Primary Programming language: Java
- Count approach: Nesma or IFPUG

- Further refinement, for instance:
- Size category
- Methodology
- Industry
- Application type
- Team size
- Time pressure (duration)
- …



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Agile Team Performance Benchmark

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IT STARTS WITH THE FACTS

Benchmark

Application AAX

Measurement Period
24-12-2019 - 25-12-2019

Select Application
AAX

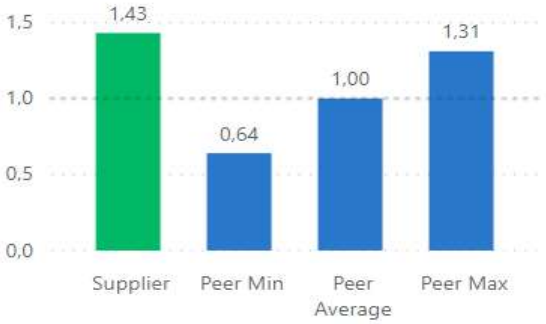
Measurement
1

Page Navigation
Overview
Application Health
Trend

Delivery Speed Index

Productivity Index

Cost Efficiency Index



Sprint Quality Index

Technical Debt Index

Grip on your portfolio

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IT STARTS WITH THE FACTS

Select Application

All

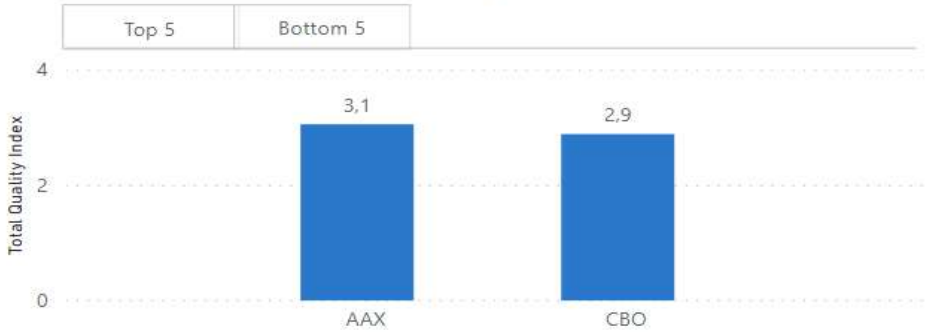
Overview

All Applications Selected

Total Quality Index	Robustness	Efficiency	Security	Changeability	Transferability
2,98	3,41	2,85	2,70	2,76	3,41
Start: 2,98 (+0,001)	Start: 3,40 (+0,002)	Start: 2,86 (-0,007)	Start: 2,69 (+0,007)	Start: 2,76 (+0,001)	Start: 3,41 (-0,001)

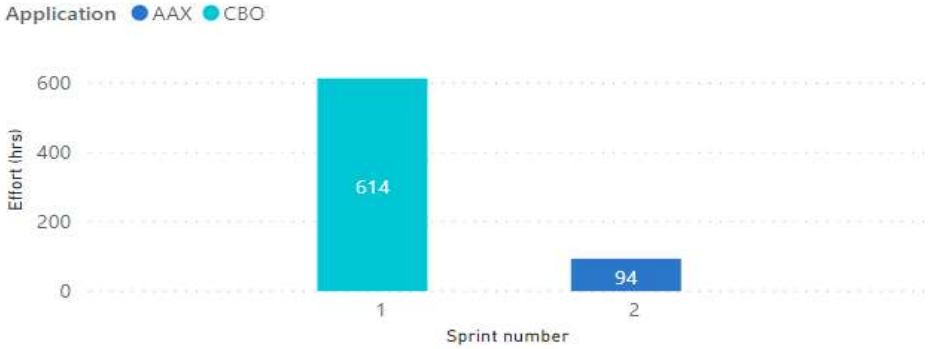
Team Performance

Total Quality Index



Function Points	Critical Violations	Lines of Code
4.067	3.962	403.370
Start: 4.038 (+29)	Start: 3.964 (-2)	

Effort in hours per sprint



Page Navigation

- Application Health
- Benchmark
- Trend

Conclusions

The good news:

It is possible to measure and compare team performance and to make fact-based management decisions based on objective metrics!

The bad news:

You need to implement Function Point metrics and the teams are not going to like that!

- Explain that objective metrics are necessary to run the organization. Maybe waste on team level but crucial, maybe even for survival!
- Don't use Story point metrics for management decision making. Story Points used in Teams are perfectly fine for sprint planning and commitment.
- Don't use Function Point metrics in the agile team… unless the team sees the value and wants to use these metrics.

The goal is never to punish, but always to understand and to improve!

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Let's connect!

Thank you!

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