

3.– 6. September 2012
in Nürnberg



Herbstcampus

Wissenstransfer
par excellence

Echolot

Qualitätssicherung mit Sonar

Thomas Haug

MATHEMA Software GmbH

- Motivation
- Sonar Überblick
- Demo
- Fazit

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“Sometimes the developers manage to maintain this purity of design through the initial development and into the first release. More often something goes wrong. The software starts to rot like a piece of bad meat”
(Robert C. Martin)

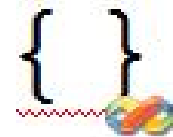


- Architektur-, Design- und Implementierungsvorgaben
 - Reviews

- Architektur-, Design- und Implementierungsvorgaben
 - Reviews
 - Statische und dynamische Analyse



JUnit

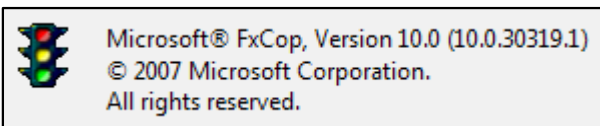


StyleCop

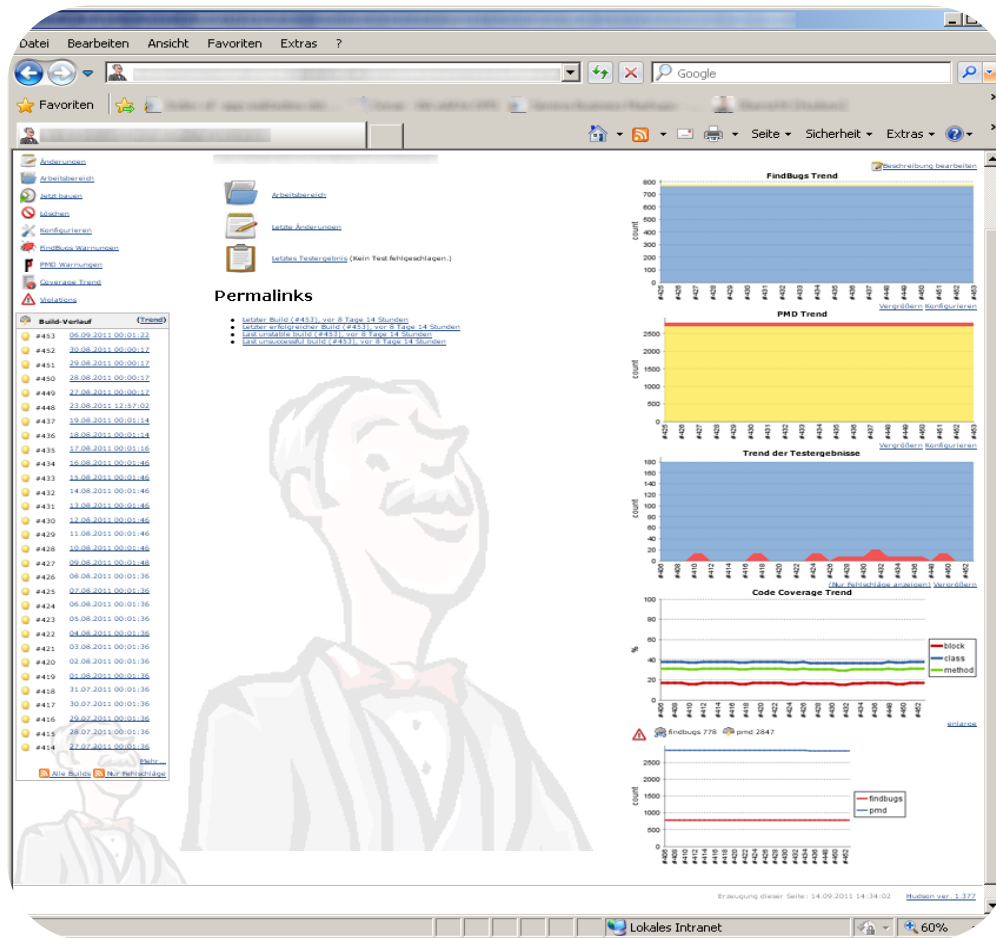


PartCover

OpenCover



- Typische Anwendung: Einsatz einer Vielzahl von Werkzeugen



JUnit



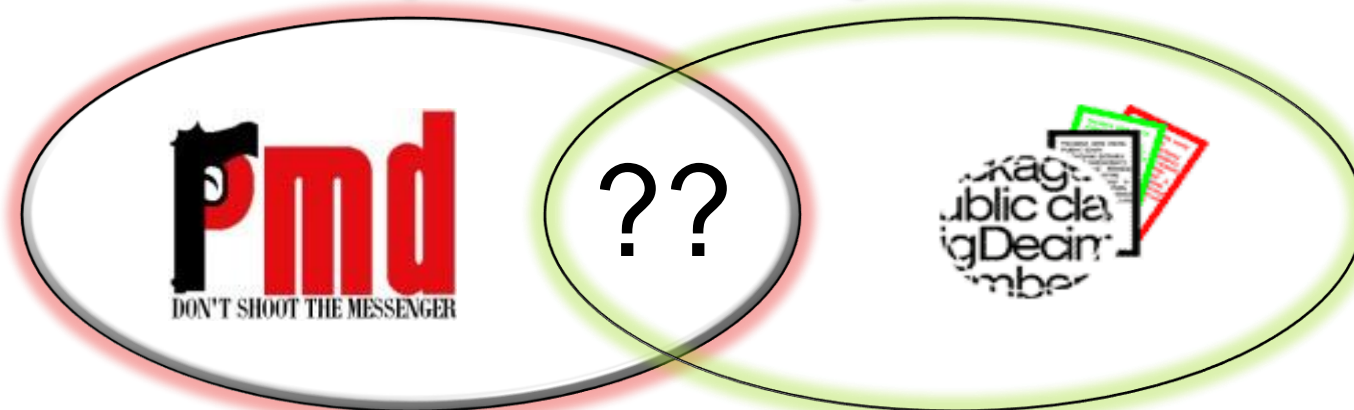
- Herausforderungen:
 - Know-how und Konfiguration unterschiedlicher Werkzeuge



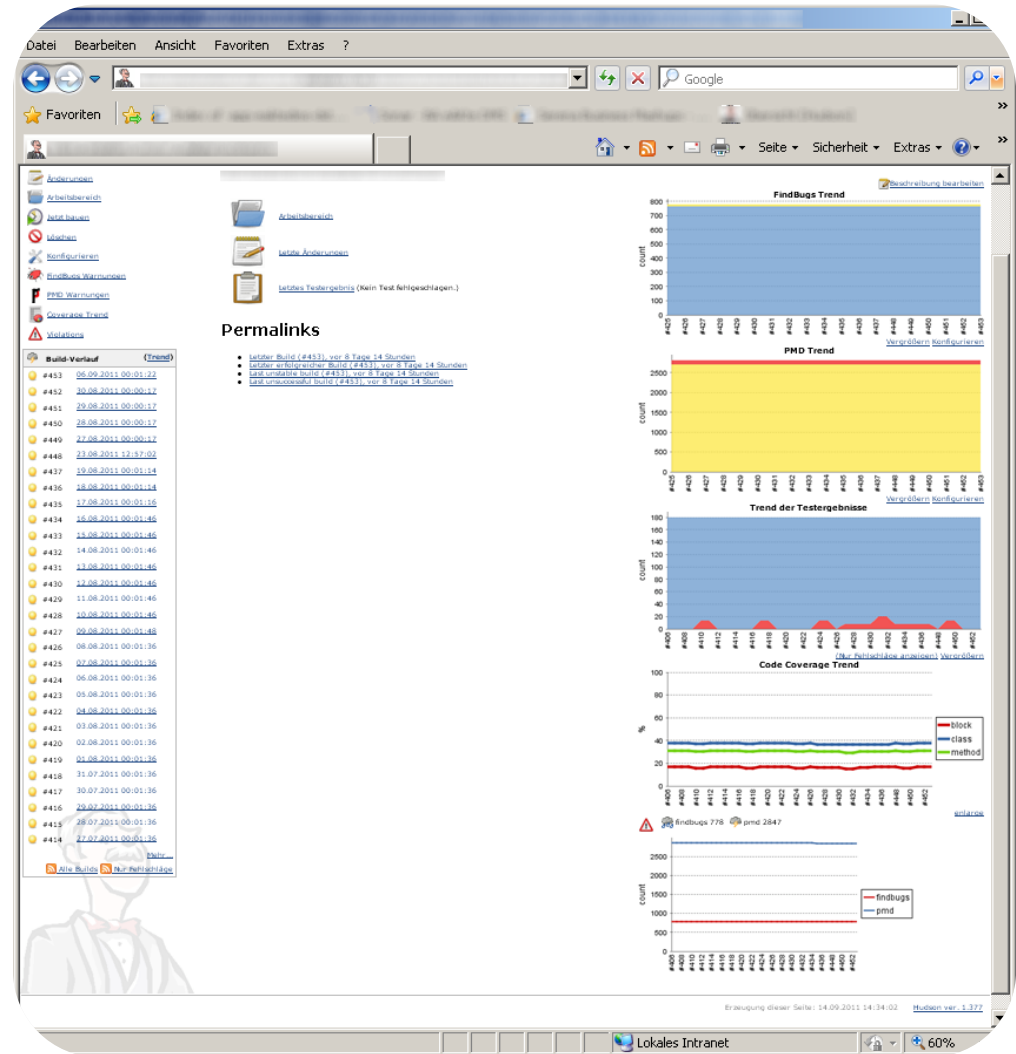
JUnit



- Überschneidungen der Werkzeuge



- Herausforderungen:
 - Einbetten in (Continuous Integration) Build
 - Trendanalyse





JUnit



OpenCover



PartCover



NCOVER



Microsoft® FxCop, Version 10.0 (10.0.30319.1)
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Subsystems

- Total System
- !!! There are Packages with
- A module
- B module
- C and D module
- E module
- F module
- G module

Packages

- org.xradar.test.a
- org.xradar.test.b
- org.xradar.test.c
- org.xradar.test.d
- org.xradar.test.e
- org.xradar.test.f
- Not Analyzed: java.io
- Not Analyzed: java.lang
- Not Analyzed: org.xradar
- Not Analyzed: org.in

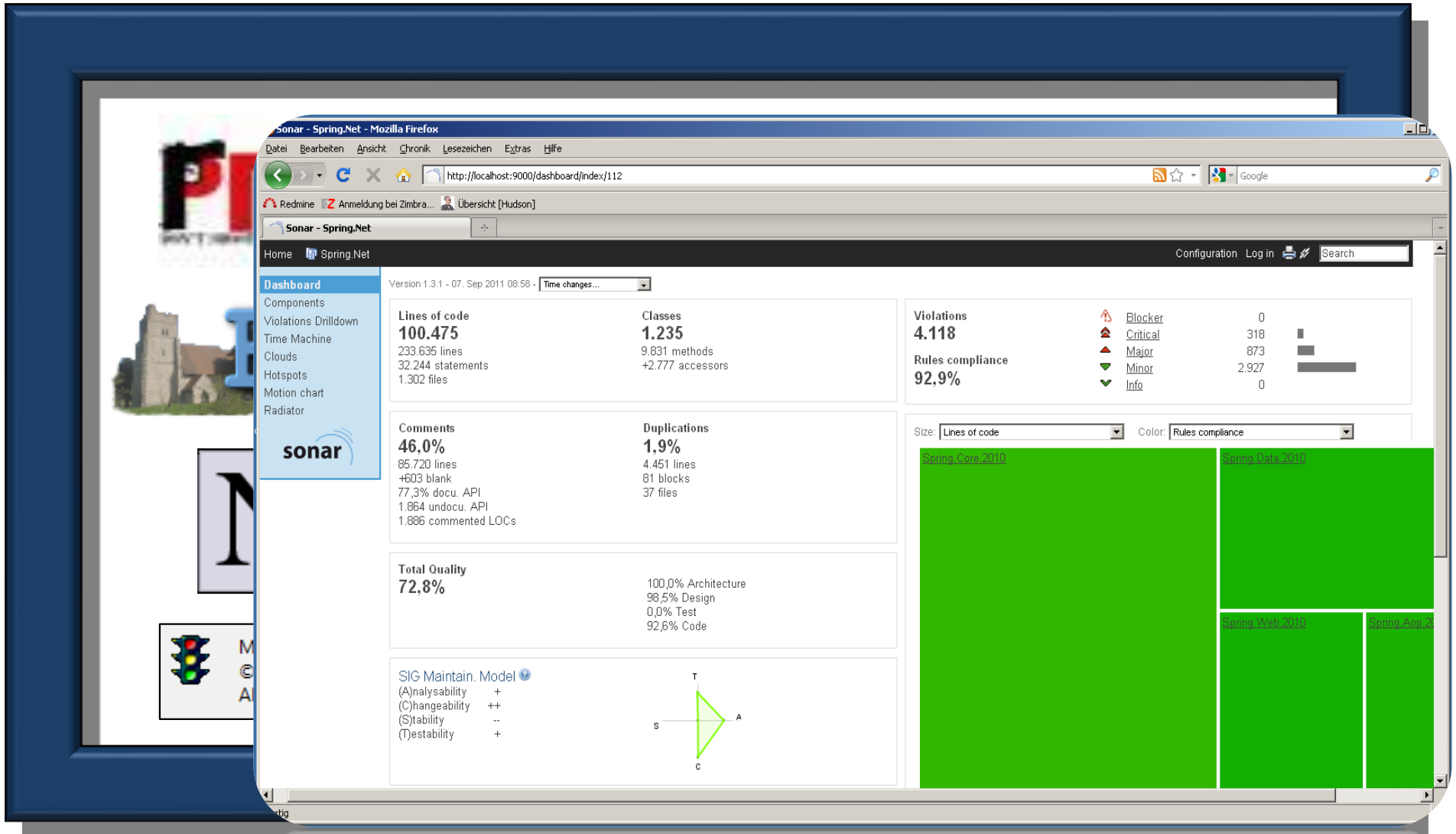
Classes

- A1
- B1
- C1
- D1
- E1
- F1

Subsystem : A module

The a module is a top module.

Metric	Value
Total Quality	0.37
Unit Test Suite	0
Statement Text Coverage	0
Method Test Reference	0
Architecture	0
Modularization	0
Cohesion	0
Design	1
Number of Methods	1
Response for Class	1
Coupling Between Objects	1
Depth of Inheritance Tree	1
Code Quality	0.48
Documentation	0.5
DRYness	1



- Motivation
- Sonar Überblick
- Demo
- Fazit

- www.sonarsource.org
- Beheimatet bei Codehaus
- Aktuelle Version 3.2 (Juni 2012)
- LGPL Lizenz-Modell, kommerzieller Support möglich



- Über 100 000 Downloads
- Knapp 20 Releases innerhalb von 2 Jahren



- Über 1000 Subscribers auf Sonar Mailing-Listen
- Erweiterbar über Plugin Mechanismus
 - Es existieren mehr als 30 Plugins

- Unterstützte Sprachen
 - Java (Build-in)
 - C
 - C#
 - Flex
 - Natural
 - PHP
 - PL/SQL
 - Cobol
 - Visual Basic 6
 - XML



- Multi-Projekt fähig
 - Alle Projekte können über das Dashboard erreicht werden

- „Drill-down“ Analyse
 - Abtauchen in die Tiefen des Designs und der Implementierung über Dashboards möglich

- Prüfen von Kodierrichtlinien
 - Über 600 Regeln vorgefertigt (Java)
 - Java : PMD, CheckStyle, FindBugs,...
 - C# : FxCop, StyleCop, Gendarme



- Standard Metriken
 - Sonar misst Metriken wie McCabe, LOC, ...
- Dynamische Analyse
 - Messen von Code-Coverage
 - via Cobertura, Emma, JaCoCo für Java
 - via NCover, PartCover, OpenCover für C#
- Build-Integration
 - Maven
 - Ant, Ad hoc (sonar runner)



■ Plugins Metriken

Additional Metrics

Artifact Size - Reports on the size of the artifact generated by projects.

Build Stability - Reports on stability of project build using Continuous Integration engine data.

Clirr - Checks Java libraries for binary and source compatibility with older releases.

Clover - Get code coverage with [Atlassian Clover](#).

Emma - An alternative to Clover and Cobertura to measure coverage by unit tests in Java.

fb-contrib - Additional rules from fb-contrib project associated to the FindBugs plugin.

GreenPepper - Collects and reports tests results of executable specifications provided by GreenPepper.

JaCoCo - An alternative to Clover and Cobertura to measure coverage by unit tests in Java.

JIRA Issues - Retrieves and reports the number of project issues from JIRA.

JMeter - Retrieve JMeter test results in SONAR.

Mantis - Retrieves and reports the number of project issues from Mantis.

Rules Meter - Gives information on the level of activation of projects quality profiles.

Security Rules - Enables to zoom on security rules violations to keep them under control.

Sonargraph - Provides architecture governance features accompanied by metrics about cyclic dependencies and other structural aspects using Sonargraph.

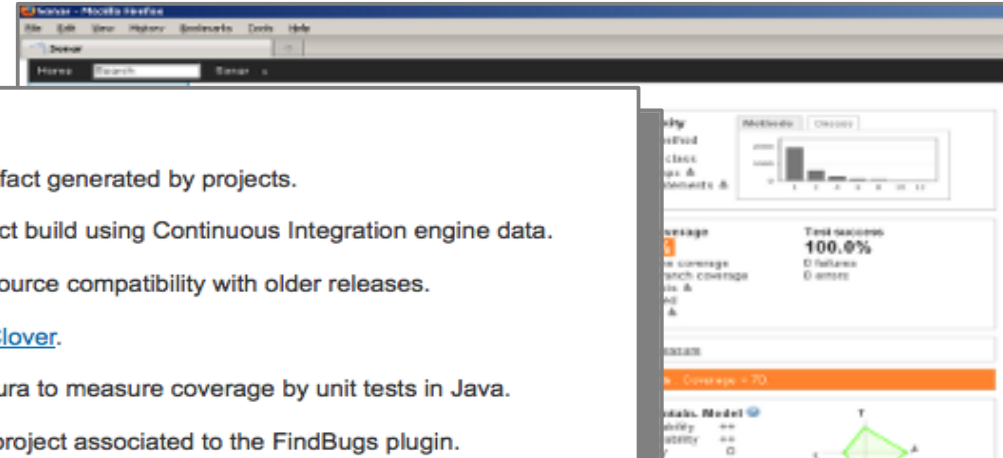
SonarJ - Provides architecture governance features accompanied by metrics about cyclic dependencies and other structural aspects using SonarJ.

Taglist - Generates a report on various tags found in the code, like @todo or //FIXME tags.

Trac - Retrieves and reports the number of project issues from a Trac instance.

Useless Code - Reports on the number of lines that can be reduced in an application.

Violation Density - Compute a new metric named violation density. This is kind of "opposite" for rule compliance metric.



■ Plugins Integration

Integration

[AnthillPro](#) - Enables to configure and launch Sonar analysis from AnthillPro

[Bamboo](#) - Enables to configure and launch Sonar analysis from [Bamboo](#), the Atlassian CI engine.

[Branding](#) - Allows to add your own logo to the Sonar UI.

[Build Breaker](#) - Makes the build fail if pre-defined alert thresholds are hit.

[Crowd](#) - Enables delegation of Sonar authentication to [Atlassian Crowd](#).

[Cutoff](#) - Exclude files from analysis based on a cutoff date threshold, to analyze the work done on an existing code base and measure the quality of new code/changes only.

[Google Calendar](#) - Posts an event, when project analysed by Sonar.

[Hudson / Jenkins](#) - Enables to configure and launch Sonar analysis from [Hudson](#) or [Jenkins](#) CI engines.

[LDAP](#) - Enables the delegation of Sonar authentication to LDAP and Microsoft Active Directory.

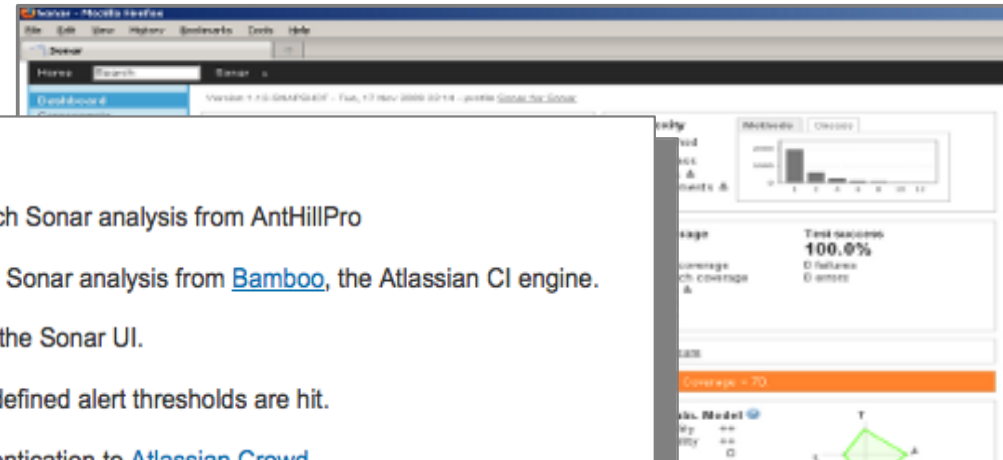
[PAM](#) - Enables the delegation of Sonar authentication to underlying PAM subsystem.

[Piwik](#) - Submits usage of a Sonar instance to a [Piwik](#) server.

[SCM Activity](#) - Collects and reports information on commits using SCM data.

[Switch off violations](#) - Exclude some violations in a fine-grained way.

[Twitter](#) - Creates tweet, when project analysed by Sonar.



■ Plugins Darstellung

Visualization / Reporting

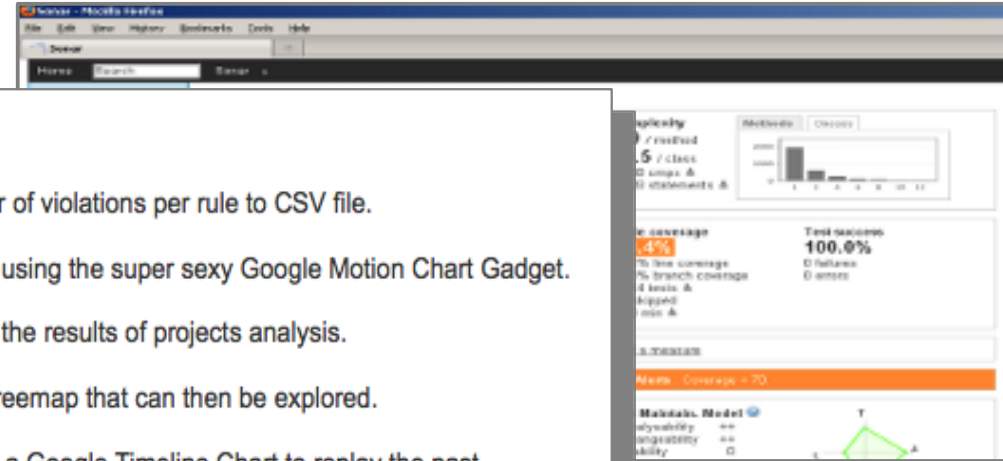
[CSV Export](#) - Export measures and number of violations per rule to CSV file.

[Motion chart](#) - Displays projects measures using the super sexy Google Motion Chart Gadget.

[PDF Report](#) - Generates a PDF report with the results of projects analysis.

[Radiator](#) - Displays measures using a big treemap that can then be explored.

[Timeline](#) - Displays measures history using a Google Timeline Chart to replay the past.



■ Plugins Steuerung

Governance

[Quality Index](#) - Calculates a global Quality Index based on coding rules, Style, Complexity and Coverage by unit tests.

[SIG Maintainability Model](#) - An implementation of the SIG MM to evaluate the maintainability of an application.

[SQALE - Quality Model](#) (Commercial) - An implementation of the SQALE Methodology, which supports the evaluation of a software application's source code in the most objective, accurate, reproducible and automated way possible.

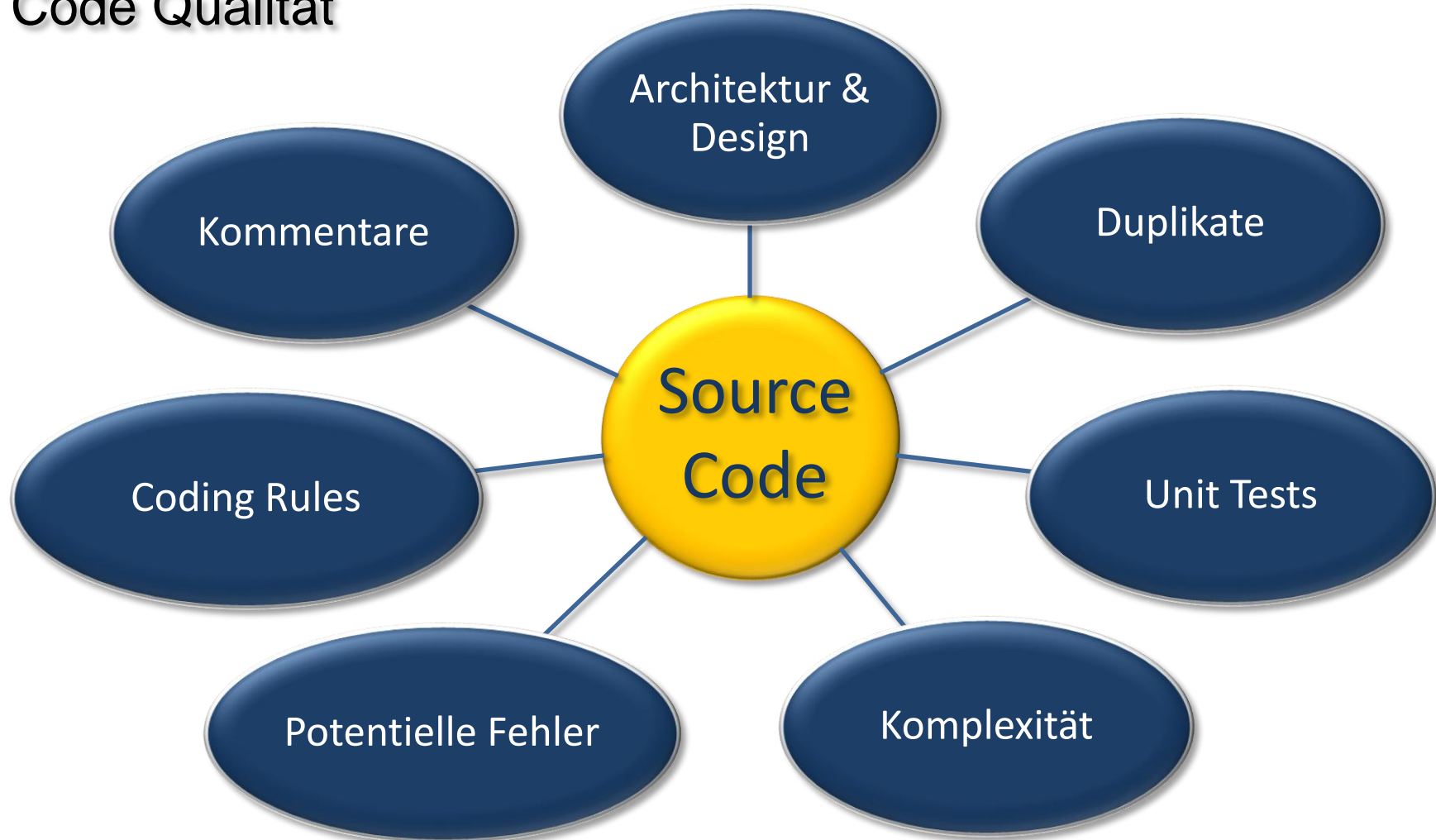
[Technical debt](#) - Calculates the technical debt on every component of projects with a breakdown by duplications, documentation, coverage, complexity...

[Total Quality](#) - Provides an overall measure of the quality of projects linking code quality, design, architecture, and unit testing.

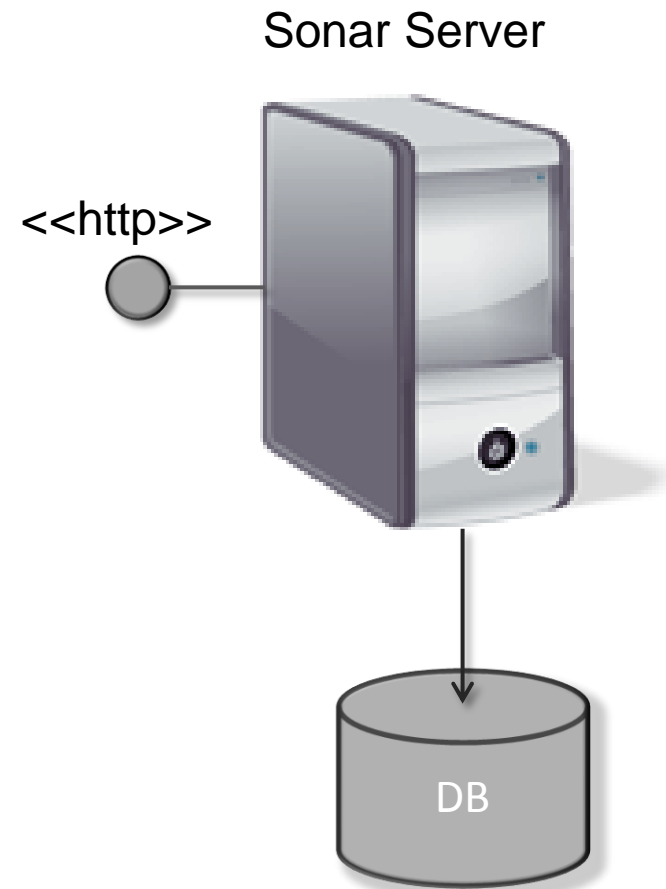
[Views - Portfolio Management](#) (Commercial) - Enables aggregation of projects. Projects can be grouped into applications, applications into teams, teams into departments...



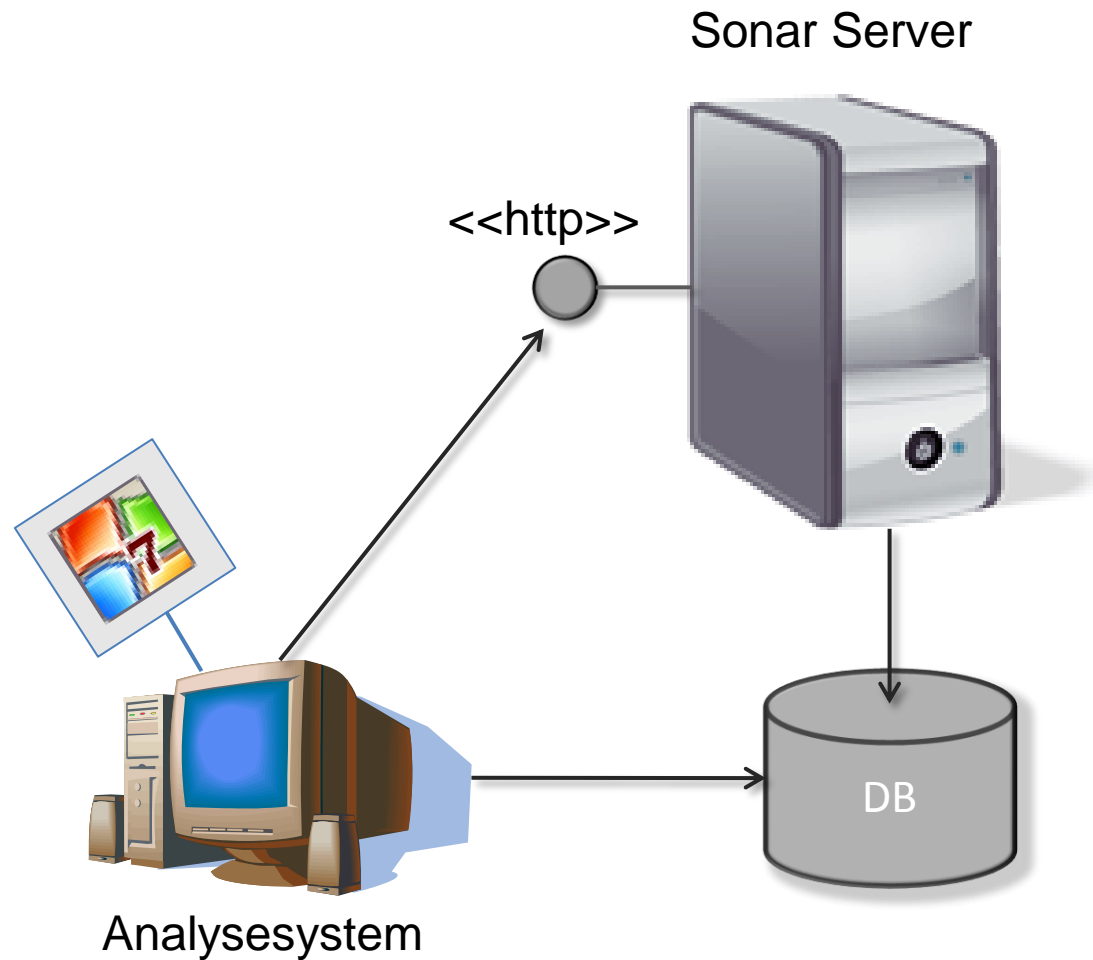
- Sonar bietet eine Sicht auf sieben Achsen/Dimensionen der Code Qualität



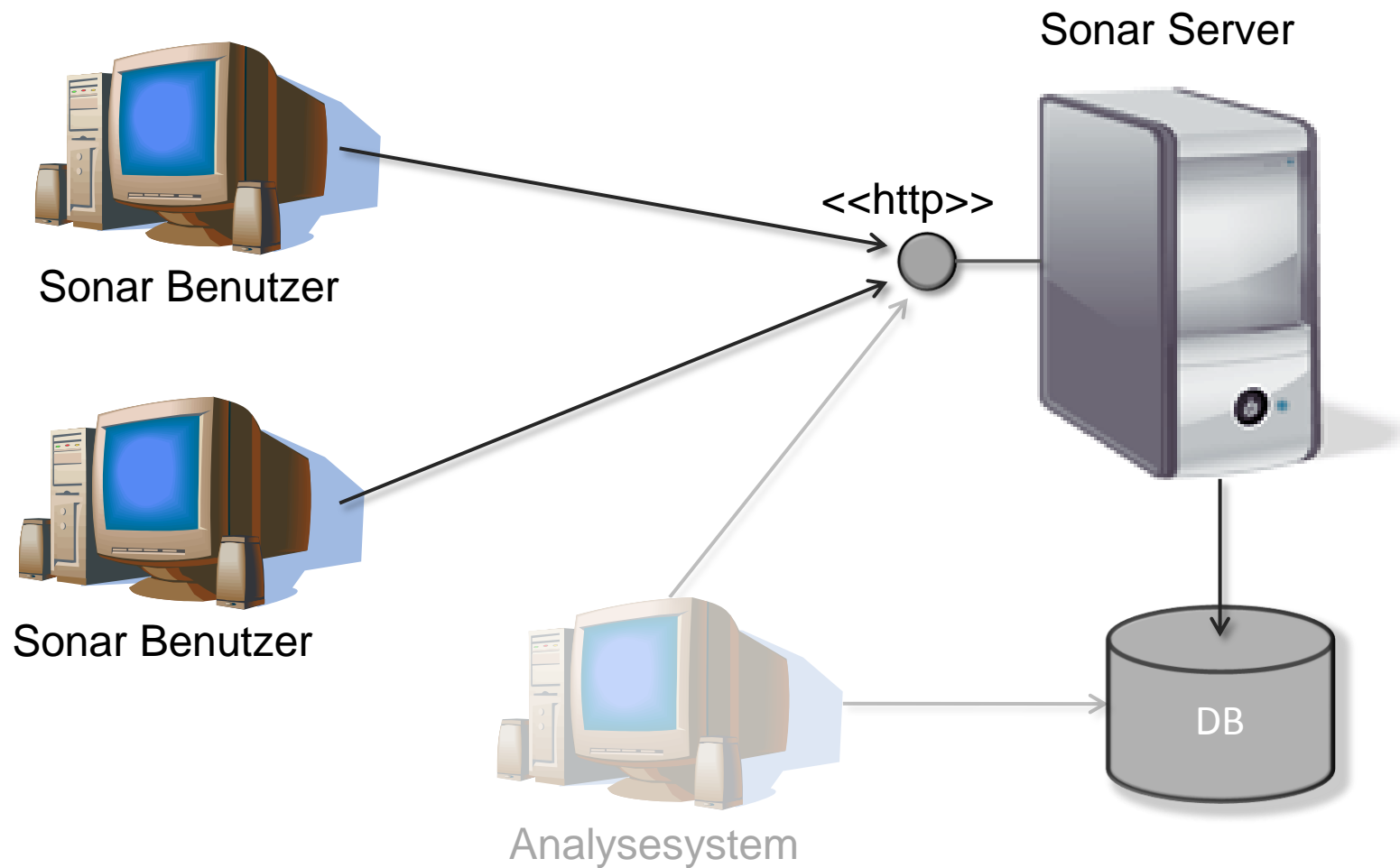
- Sonar Setup



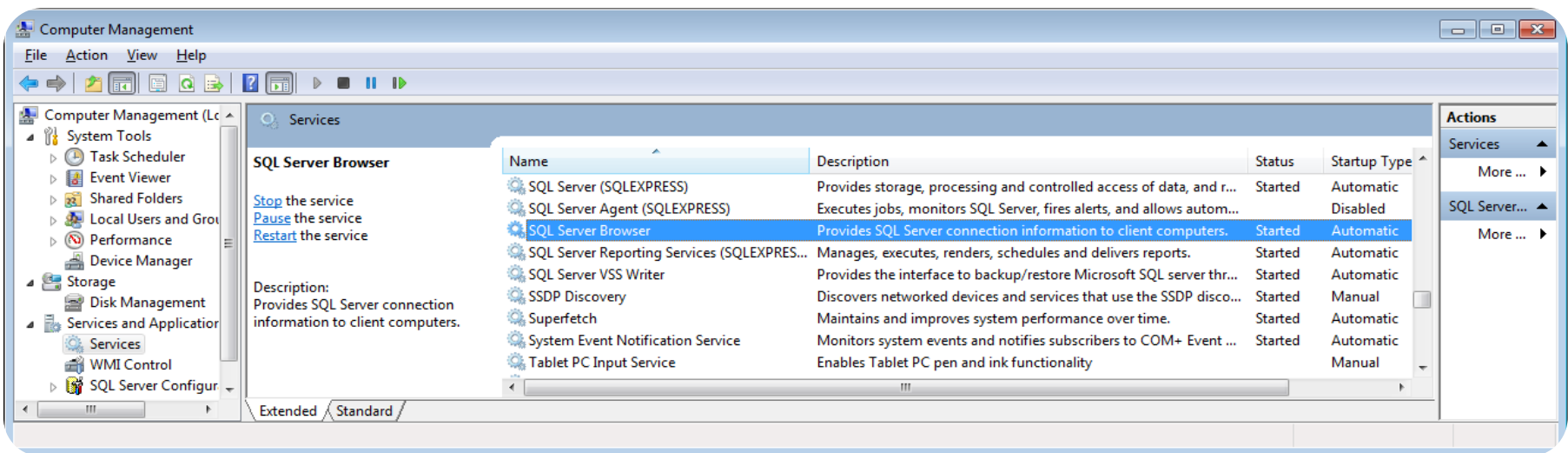
- Sonar Setup



■ Sonar Setup



- Vorbereitung SQL Server (Express)
 - Benutzer anlegen (z.B sonar/sonar mit SQL Server Authentifizierung)
 - Datenbank in SQL Server anlegen
 - SQL Server Browser aktivieren
 - Wird für jDTS JDBC Treiber benötigt



- Vorbereitung Sonar Konfigurieren
 - JAVA_HOME
 - Sonar.config anpassen (Datenbank Konfiguration)

- ... starten



Los geht's

- Motivation
- Sonar Überblick
- Demo
- Fazit

- Fazit
 - Sonar lässt sich sehr schnell aufsetzen
 - Konfiguration der „Violation rules“ einfach
 - Definition der Sichten (Dashboards) erleichtert Adressaten gerechte Informationen
 - Sicherheitskonzept mit Benutzern und Gruppen
 - Sowohl Java als auch C#

Viel Spaß mit **sonar** 

thomas.haug@mathema.de

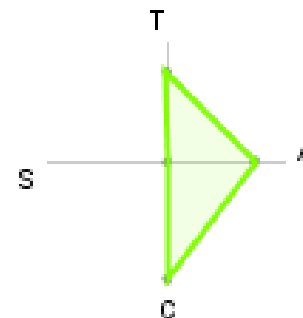
- Backup

Maintainability Model

- Definiert von Software Improvement Group (SIG)
- Einfaches Wartbarkeitsmodell
- basiert auf 4 Dimension
 - Analysierbarkeit
 - Änderbarkeit
 - Stabilität
 - Testbarkeit

SIG Maintain. Model ⓘ

(A)nalsability	+
(C)hangeability	++
(S)tability	--
(T)estability	+



- (Projekt/System) Volumen
 - Größe des gemessenen System

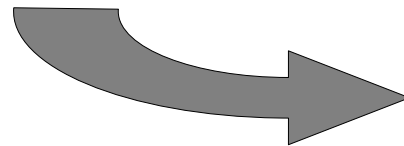
Rank	LOC
--	> 1310000
-	> 655000
0	> 246000
+	> 66000
++	> 0

- Duplikate
 - Anzahl duplizierte Zeilen im System

Rank	Duplication
--	> 20%
-	> 10%
0	> 5%
+	> 3%
++	> 0%

- (Projekt/System) Komplexität
 - Nutzt die McCabe zyklomatische Komplexität
 - Prozentualer Anteil der LOC, die zu Methoden gehören, die in einem Komplexitäts-Bereich liegen

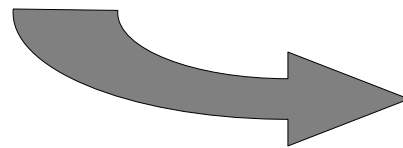
Eval	Complexity
Very high	> 50
High	> 20
Medium	> 10
Low	> 0



Rank	Medium	High	Very High
++	< 25%	< 0%	< 0%
+	< 30%	< 5%	< 0%
0	< 40%	< 10%	< 0%
-	< 50%	< 15%	< 5%

- Unit (= Methoden) Größe
 - Prozentualer Anteil von LOC, die zu Methoden eines gewissen Größenbereichs (LOCs) gehören

Eval	LOCs
Very high	> 100
High	> 50
Medium	> 10
Low	> 0



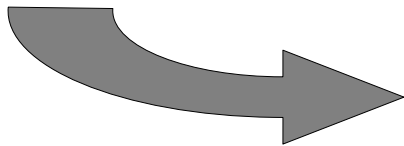
Rank	Medium	High	Very High
++	< 25%	< 0%	< 0%
+	< 30%	< 5%	< 0%
0	< 40%	< 10%	< 0%
-	< 50%	< 15%	< 5%

- Unit-Tests
 - Code Coverage (Zeilenabdeckung)

Rank	Coverage
++	> 95%
+	> 80%
0	> 60%
-	> 20%
--	> 0%

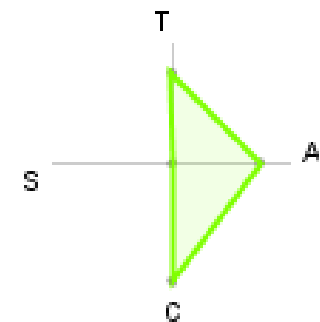
■ Sonar Erweitern

	Volume	Complexity	Duplications	Unit size	Unit tests
analysability	✓		✓	✓	✓
changeability		✓	✓		
stability					✓
testability		✓		✓	✓



SIG Maintain. Model ⓘ

(A)nalsability +
 (C)hangeability ++
 (S)tability --
 (T)estability +



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Vielen Dank!

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