



DR-Tools

A tool quality suite to help the
developers to maintain health and code evolution

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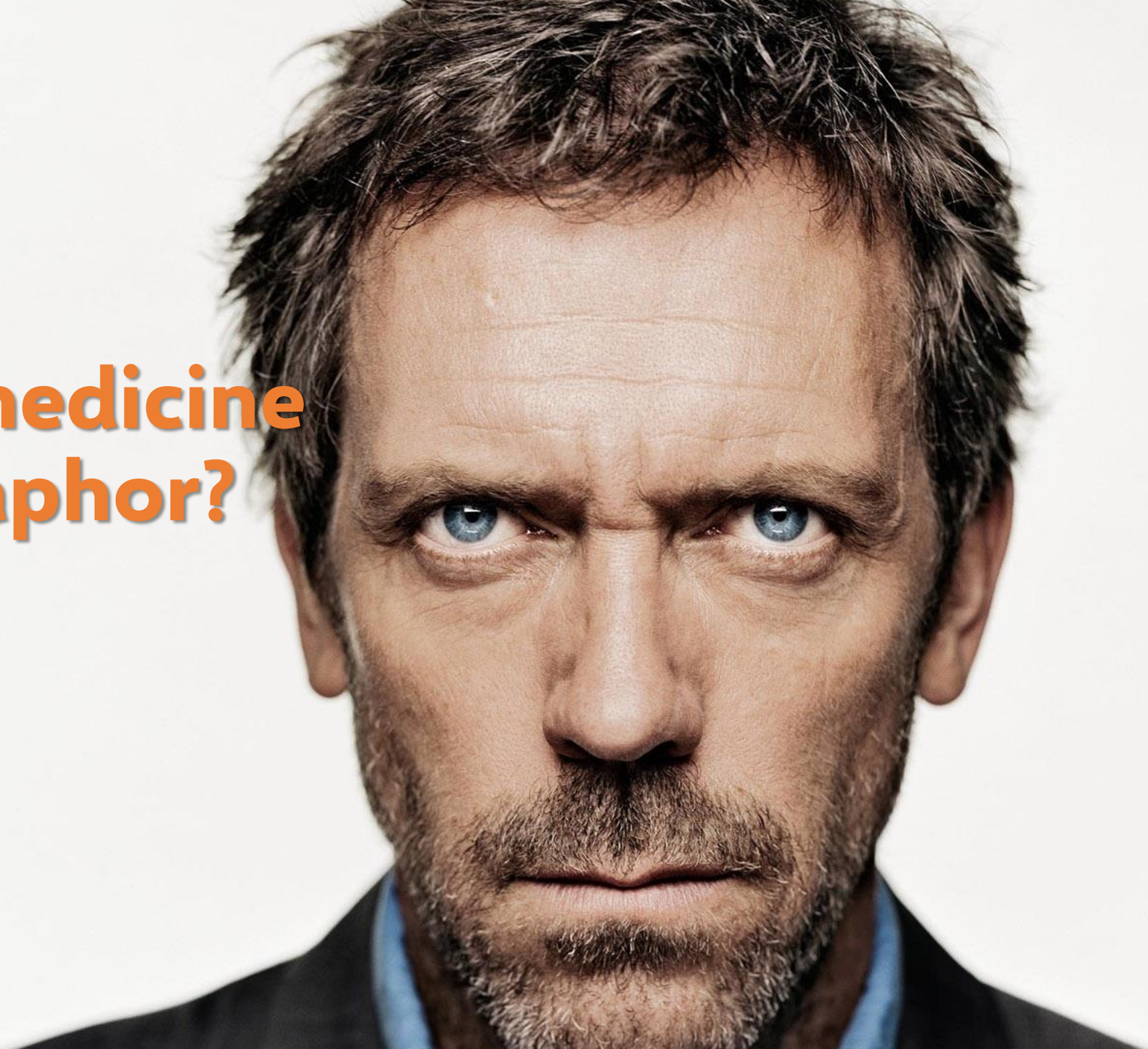
Who am I?

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- ✓ Computer Science MSc and PhD Student (UFRGS)
- ✓ Graduate and Undergraduate Lecturer (UniRitter, Unisinos, and UFRGS)
- ✓ Associate Consultant (Wildtech)
- ✓ Agile Methods Pioneer in Brazil
- ✓ XP-RS/GUMA Community Co-founder
- ✓ ScrumAlliance , IASA, SBC, and ACM Member



**Why medicine
metaphor?**





Metric Definition and Thresholds

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Summary



Small Project (SMALL)

small project with < 50 KLOC or $200 < \text{classes}$



Medium Project (MEDIUM)

medium project with $(50 \text{ KLOC} \leq \text{project} \leq 250 \text{ KLOC})$ or $(200 \leq \text{classes} \leq 1000)$



Large Project (LARGE)

large project with > 250 KLOC or > 1000 classes



Namespaces



Number of Types/Classes (NOC)

Good: ≤ 11 ; Regular: between 11 and 28; Bad: > 28



Number of Abstract Types/Classes (NAC)

Without references



Types (1)

✓ **Type/Class Line of Code (SLOC)**

Bad: > 500

✓ **Number of Functions/Methods (NOM)**

Good: ≤ 6 ; Regular: between 6 and 14; Bad: > 14

✓ **Number of Public Methods (NPM)**

Good: ≤ 10 ; Regular: between 11 and 40; Bad: > 40

✓ **Weighted Methods per Class (WMC)**

Good: ≤ 20 ; Regular: between 20 and 100; Bad: > 100

✓ **Number of external (external APIs, frameworks, libs) types/classes dependencies (DEP)**

Bad: > 20



Types (2)

- ✓ **Number of other internal types/classes dependencies (I-DEP)**
Bad: > 15
- ✓ **Number of other types that depend on a given type (FAN-IN)**
Bad: > 10
- ✓ **Number of other types referenced by a type (FAN-OUT)**
Bad: > 15
- ✓ **Number of Attributes/Fields (NOA)**
Good: ≤ 3 ; Regular: between 3 and 8; Bad: > 8



Methods

✓ **Method Lines of Code (MLOC)**

Good: ≤ 10 ; Regular: between 10 and 30; Bad: > 30

✓ **Cyclomatic Complexity (CYCLO)**

Good: ≤ 2 ; Regular: between 2 and 4; Bad: > 4

✓ **Number of Invocations (CALLS)**

Bad: > 5

✓ **Nested Block Depth (NBD)**

Good: ≤ 1 ; Regular: between 1 and 3; Bad: > 3

✓ **Number of Parameters (PARAM)**

Good: ≤ 2 ; Regular: between 2 and 4; Bad: > 4



Namespace Coupling



Afferent Coupling (CA)

Good: ≤ 7 ; Regular: between 7 and 39; Bad: > 39



Efferent Coupling (CE)

Good: ≤ 6 ; Regular: between 6 and 16; Bad: > 16



Package Instability (I)

range between 0=Maximally stability and 1=Maximally instability



Abstractness Degree (A)

range between 0=Minimally abstractness and 1=Maximally abstractness



Normalized Distance (D)

range between 0=exactly located in the main sequence and 1=far from the main sequence



Type Coupling

- ✓ **Number of external (external APIs, frameworks, libs) types/classes dependencies (DEP)**
Bad: > 20
- ✓ **Number of other internal types/classes dependencies (I-DEP)**
Bad: > 15
- ✓ **Number of other types that depend on a given type (FAN-IN)**
Bad: > 10
- ✓ **Number of other types referenced by a type (FAN-OUT)**
Bad: > 15

References

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