The Darker Side of Metrics

PNSQC ´00

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Software Metrics

- Assignment of values according to rules
- Cem Kaner's ten factors
- Observation versus Control
- Examples on the darker side

Example: A Race[1]

- Sandy, Joe and Susan run in a race. Sandy comes in first, Joe second, and Susan third.
  - We assign Sandy the number 1 for first place and give her $10,000
  - We assign Joe the number 2 and give him $1,000
  - We assign Susan the number 3 and give her $100

We assigned the numbers according to a rule.

- Questions
  - Is Sandy twice as fast as Joe and three times as fast as Susan?
  - Is Sandy 10 times as fast as Joe and 100 times as fast as Susan?
  - Isn't the assignment of the numbers based on their speed?

Did we measure their speed or not?

[1]Kaner, C. "Yes, But What Are We Measuring?," 1999 PNSQC

Kaner's Measurement Factors

1) The ***purpose*** of the measure.

2) The ***scope*** *of the measurement*.

3) The ***attribute*** *to be measured*.

   4) The appropriate ***scale*** *for the attribute*.

   5) The *natural* ***variation*** *of the attribute*.

6) The ***instrument*** *that measures the attribute*.

   7) The ***scale*** *of the instrument.*

   8) The ***variation*** *of measurements* made with this instrument.

9) The ***relationship*** *between the attribute and the instrument*.

10) The *probable* ***side effects*** of using this instrument to measure this attribute.

Observation Versus Control

- Taking measures to learn about a product or process

or

- Taking measures so corrective action can be taken

Readiness for Release

- Defect find/fix rate
- Percent of tests running/passing
- Complex model based metrics

Defect find/fix rate

- Mechanism
  - Counts of defects
  - Plots to show convergence
- Potential problems
  - Relationship with release readiness
  - Natural variation
  - Difficulties with counting

Defect Rate Side effects

- “Consolidation”
- Unassigned
- Delays in reporting
- Shifting blame
- Reassignment

Percent of Tests

- Mechanism
  - Counts of tests planned/run
  - Ratios to show completion
- Potential problems
  - Relationship with release readiness
  - Natural variation
  - Difficulties with counting

Percent of Tests

- Redefining what a test is
- Not counting tests that can’t run
- Redefining “Pass”
- Updating expected results

Model Based Metrics

- Mechanism
  - Several measurements combined
  - Equation used to describe progress
- Potential problems
  - Relationship to project status
  - Natural variation
  - Difficulties with measures
  - “Believing is seeing it” effect

Model Based Metrics

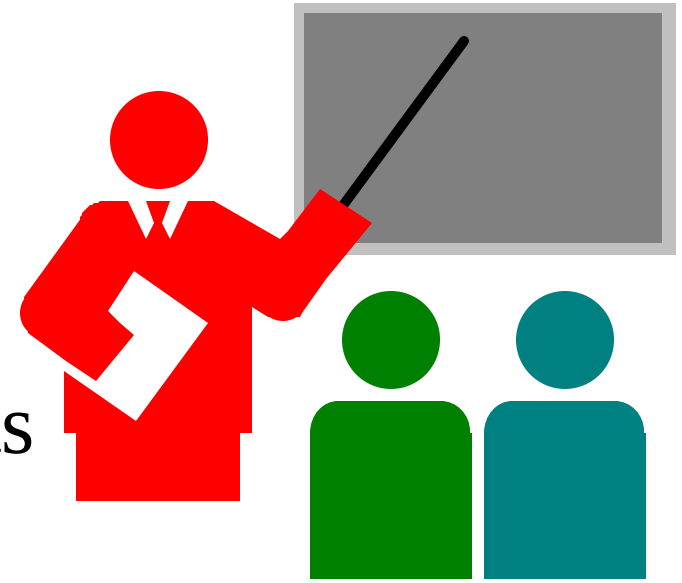
- Release on faith - the model says so
- Punishment of the innocent
- Proliferation of questionable reports
- “Dry labing”

Other Effects of Metrics

- Management changes the rules
  - No deferral
  - No assignment to other projects
  - No cloning of defects
- “Go to the movies” report reduction
- Questionable resolutions
- Un-assignment of defects

What Can We Do?

- Use metrics to observe
- Select metrics scientifically
- Understand the models
- Weigh the costs and benefits
- Watch out for side effects



Acknowledgments

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