



CS 428
WEBSTER #3

Winter 2022

Bruce F. Webster

LIES, DAMNED LIES, AND PROJECT METRICS [PART I, PART II, PART III] (BASELINE, 2008)

- Same problem as project estimation, but for a project already underway
 - Most organizations are very bad at predicting when a given project will ship
 - Usually rely on 'metrics' that aren't at all useful
- A meaningful, useful project metric has three key qualities:
 - Informative/predictive: tells you something important and/or when you will deliver
 - Objective: should yield the same value regardless of who is doing the measuring
 - Automated: can be done quickly and without direct human intervention
- Almost all major metrics used in IT projects lack one, two, or all three qualities

METRICS: METRIC “LAWS”

- **Weinberg’s Law of Metrics:** “That which gets measured, gets fudged.”
 - We will distort work and reporting to achieve required or valued metrics
- **The Metric Law of 90s:** “The first 90 percent of a development project takes 90 percent of the schedule. The remaining 10 percent of the project takes the other 90 percent of the schedule.”
 - We tend to focus on low-hanging fruit in order to make metrics look good
- **The Metric Law of Least Resistance:** “The more human effort required to calculate a metric, the less often (and less accurately) it will be calculated, until it is abandoned or ignored altogether.”
 - Hence the need for automation (cf. classic joke about drunk looking for keys)
- **Must-read book:** *Measuring and Managing Performance in Organizations* by Robert D. Austin (Dorset House, 1996)



METRICS: VISUAL ASSESSMENT IN REAL LIFE



- Why is project completion so hard to predict?
 - The amount of analysis (gathering relevant subject-matter information) that still has to occur
 - The amount of invention (novel problem solving) that still has to occur (cf Armour, as usual)
 - The amount of discovery (e.g., running into roadblocks and dead ends) that still has to occur (again, Armour)
 - The adequacy of the current architecture, design and implementation
 - The amount of actual coding that still has to occur
 - The amount of quality engineering (testing, reviews, etc.) that still has to occur
 - Unexpected turnover among engineering personnel
 - Changes in market requirements and/or opportunities
 - Changes in external systems upon which you depend

METRICS: THE CHALLENGE

METRICS: POTENTIAL APPROACH TO USEFUL METRICS

- First, instrumentation: automated collection of wide range of metrics/characteristics over time
 - Result: time-stamped history for each metric/characteristic
 - These should be automated and objective
 - Can be tied to configuration management system and run on a regular basis
- Second, heuristics: use data collected
 - After project is done and with known timeline, use Bayesian analysis to see which combination of metrics best anticipate milestone completion
 - Use human analysis as well to look for correlations between metrics and actual progress (or lack thereof)
 - Refine set of metrics/characteristics for next project and see how well they predict progress