RAPID
Optimizing Release Cadence: Metrics and Research

Engineering Excellence
Development Discipline

2011-Nov

Message Summary

- There is no magic pill for metrics
- Good use of metrics demands discipline for a “full diet”

Investigation Process

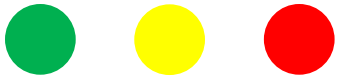
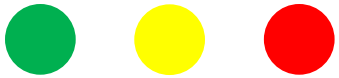
- Investigation of books, papers, online
- Meetings with SMEs (Subject Matter Experts)

What Is a Metric?

- Measurement: the temperature is 37 °F

A metric is a variable for which we can estimate a range of expected measurements, given a context.

Metrics, KPIs and BI

Variable ("performance indicator")	Code Churn	EPS (Earnings Per Share)
Metric	25% 	$: 0.65 
Analytics	Up from 15% (bad)	Up from 0.5 in Q2
Intelligence	20% in a week	#: 0.5 next quarter

Why Do We Care About Metrics?

No Metrics Magic Pill

Next Slides

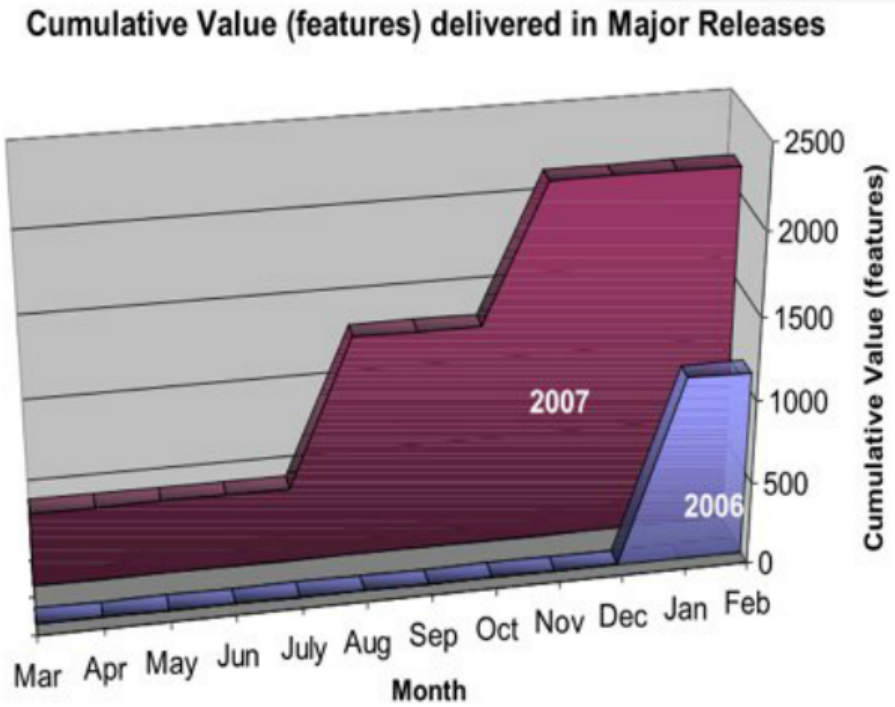
- Examples of
  - ~~Metrics within Microsoft~~
    - (Redacted in public version)
    - But we can talk about some obvious ones…
  - Metrics in the software industry

Metrics Within Industry (1/3)

Value Metric - Feature Delivery

salesforce.com
Success On Demand.™

- 94% feature request increase from 2006 - 2007
- 38% increase in feature request delivered **per developer**



Source: Scrum Gathering 2008 - Salesforce.com Keynote Address

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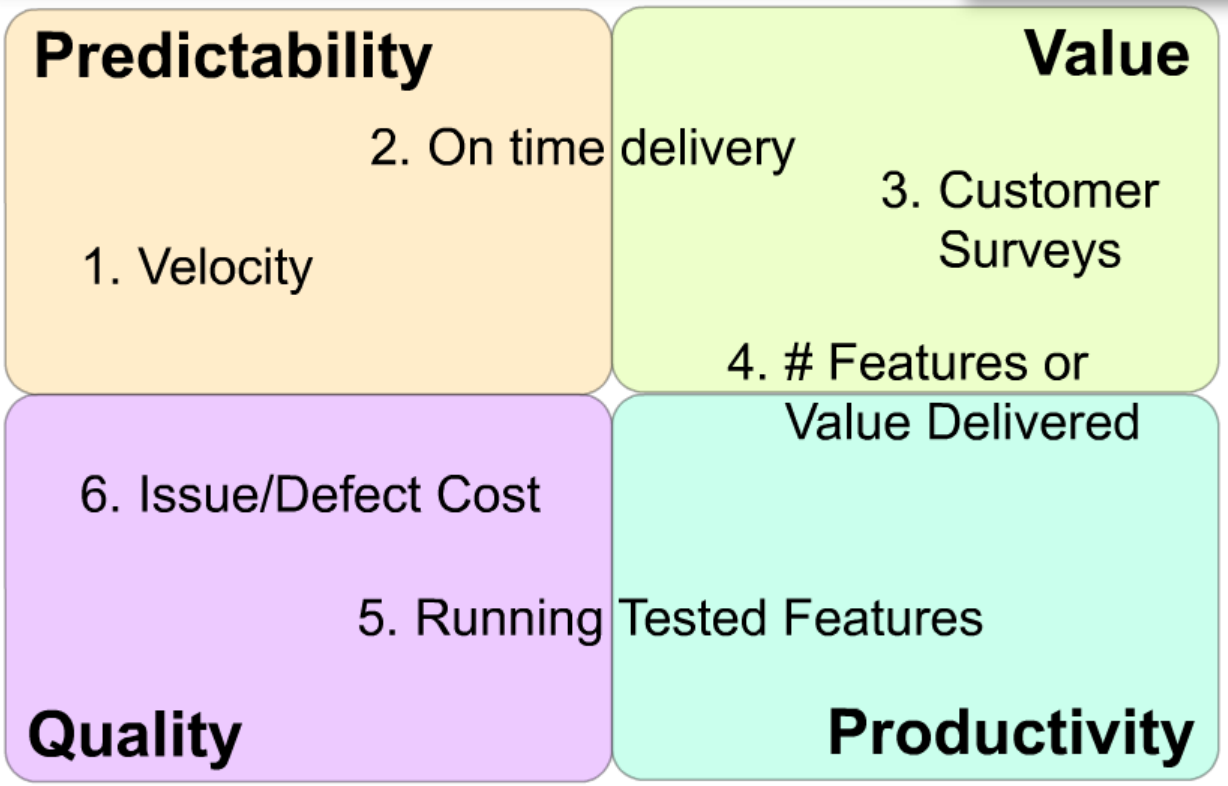
Metrics Within Industry (2/3)

Top 5 (or 6) Agile Metrics



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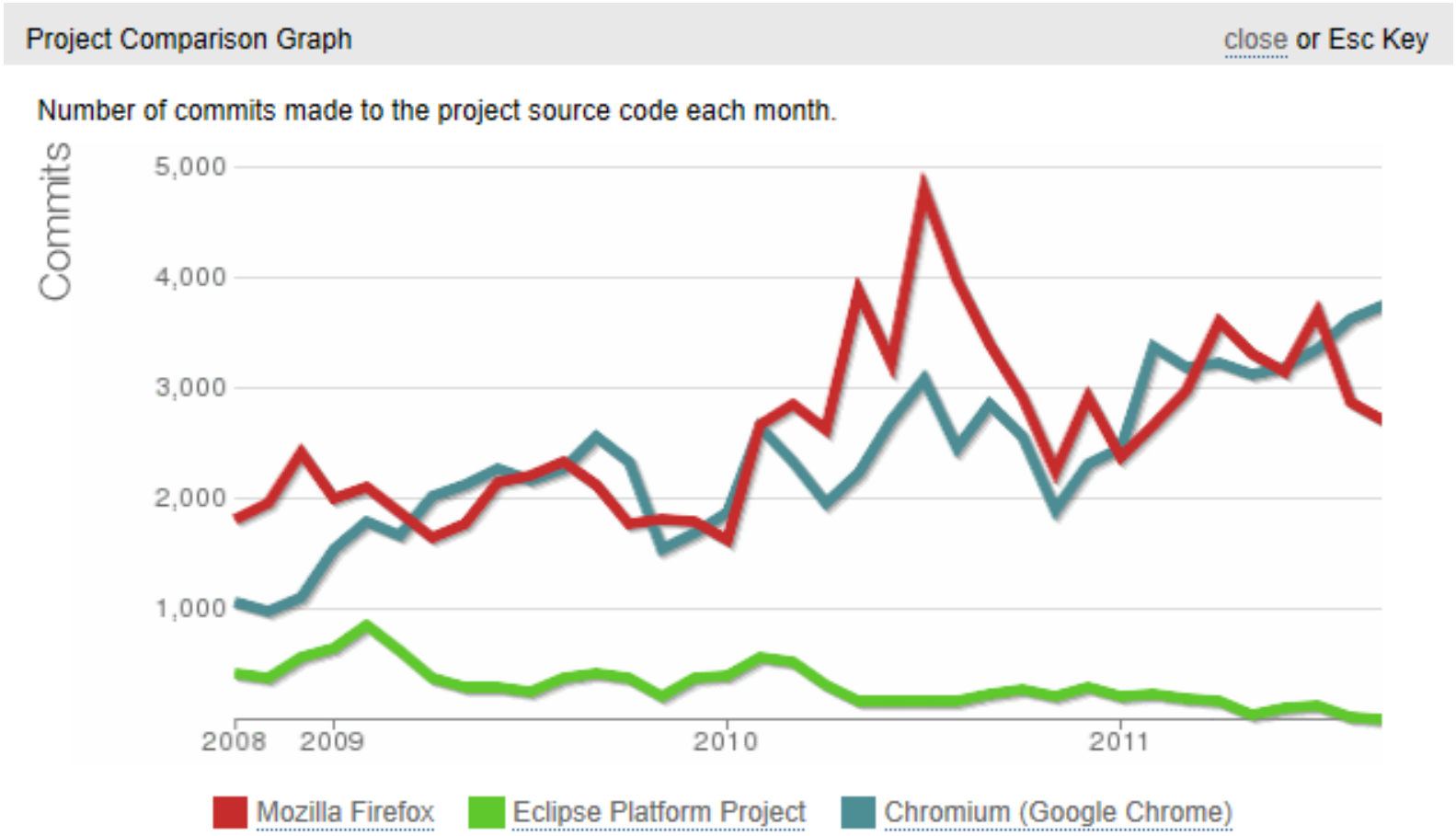
Metrics Within Industry (3/3)



Back to Modeling Metrics

- Multiple Models
  - Functional, size, process, project management, quality, etc.
- Different Goals
  - Past performance evaluation, estimation for the future, comparison across projects
- Focused Research
  - Data available is irrelevant, anecdotal, filtered, etc.
  - Little or no correlation between data and conclusions

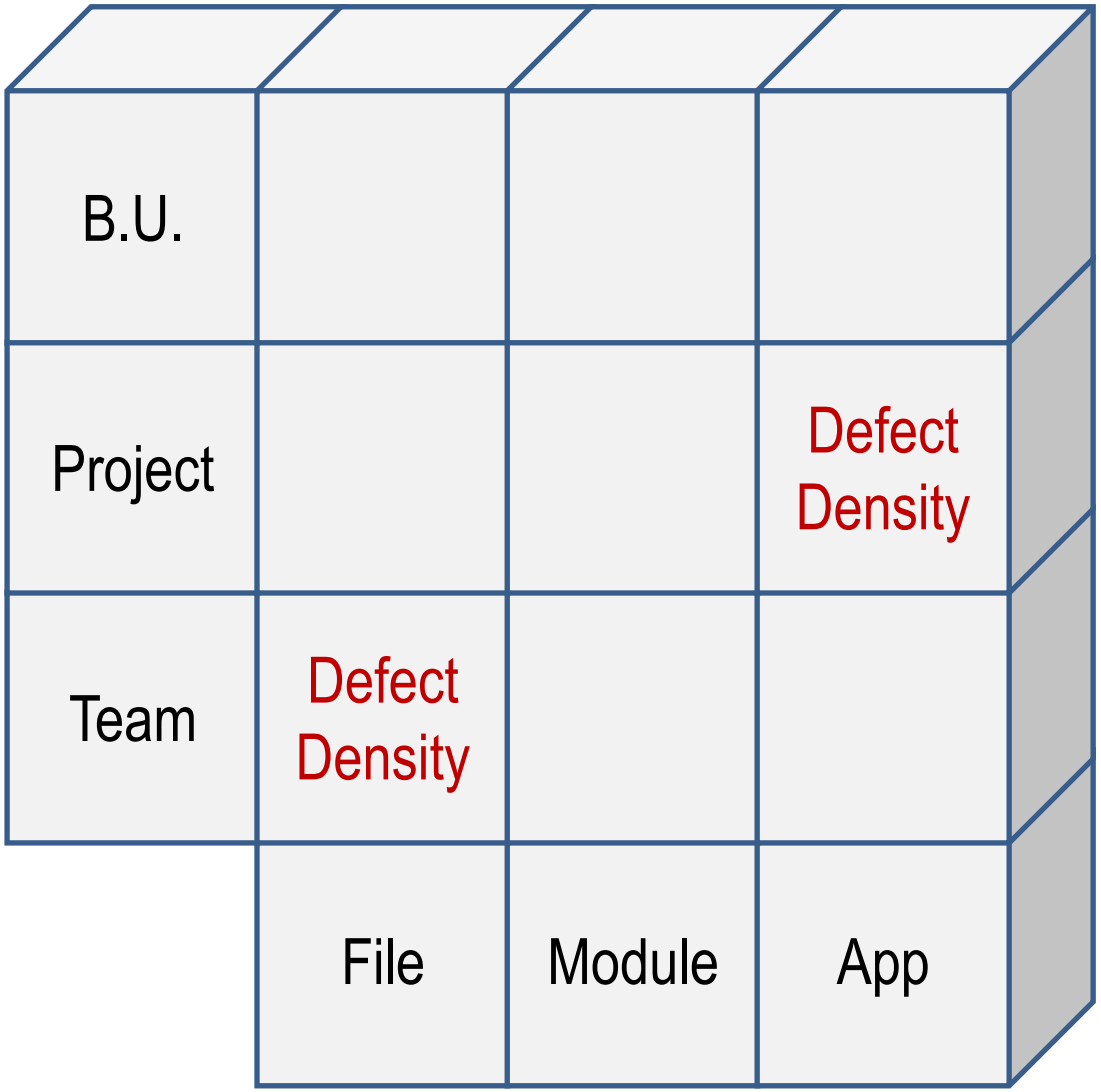
Example of Model for Metrics

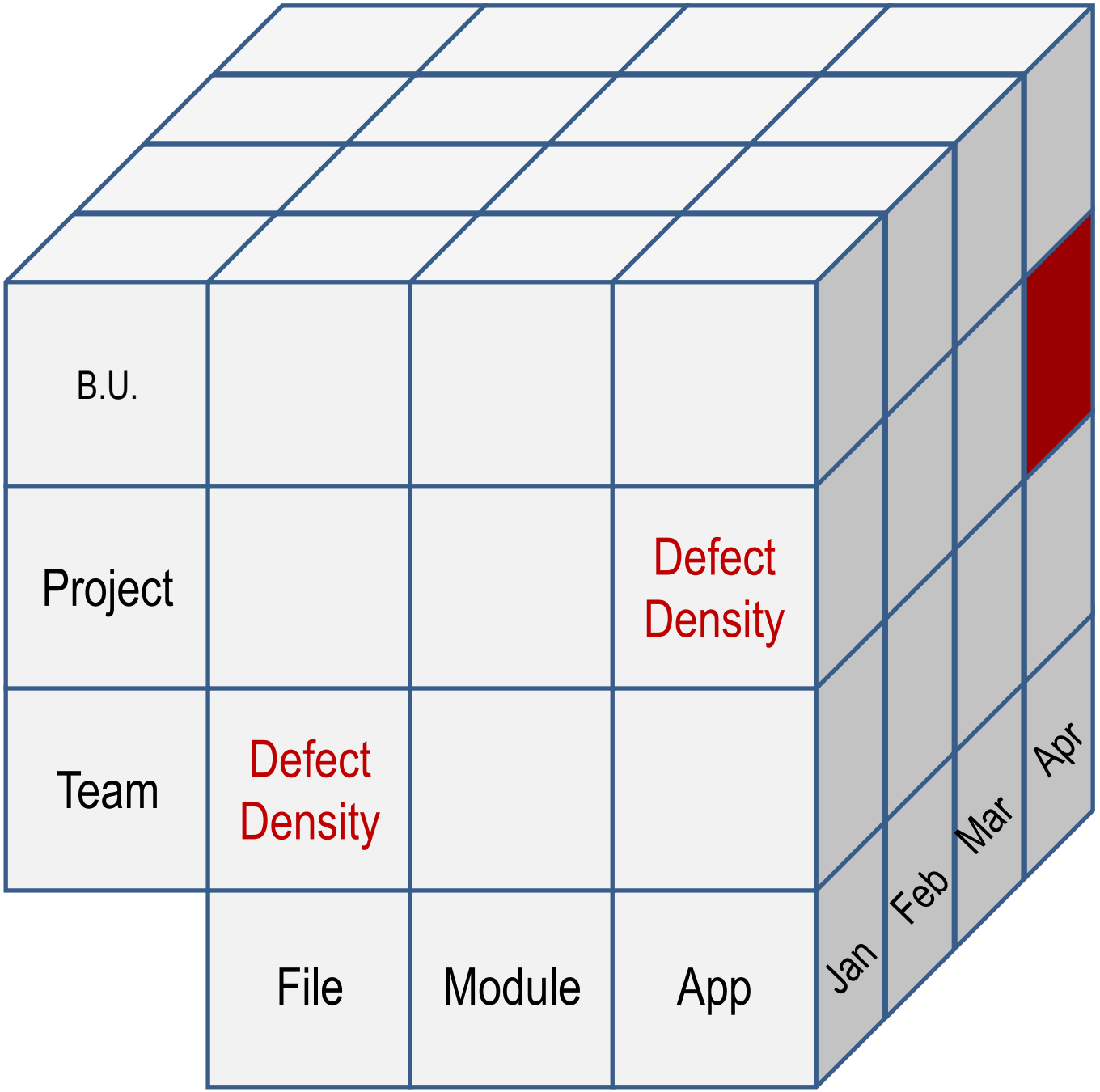
- Size
  - Lines of code, story points, function points, ...
- Quality
  - Defect density, rate of discovery/removal, ...
- Schedule
  - Completion percentage, velocity, ...
- Effort
  - Number of man*months, cost, ...

Variables and Dimensions

Business Unit	Earnings, Yield, Customer Satisfaction, Customer Acquistion, ...		
Project	Cost, Completion Rate, Lines of Code, Defect Density, ...		
Team or Individual	Implementation Velocity, Code Churn, Defect Density, ...		
	File	Module	Application

Context: Variables and Dimensions




B.U.
Project
Team
Defect Density
Defect Density
File
Module
App
Jan
Feb
Mar
Apr

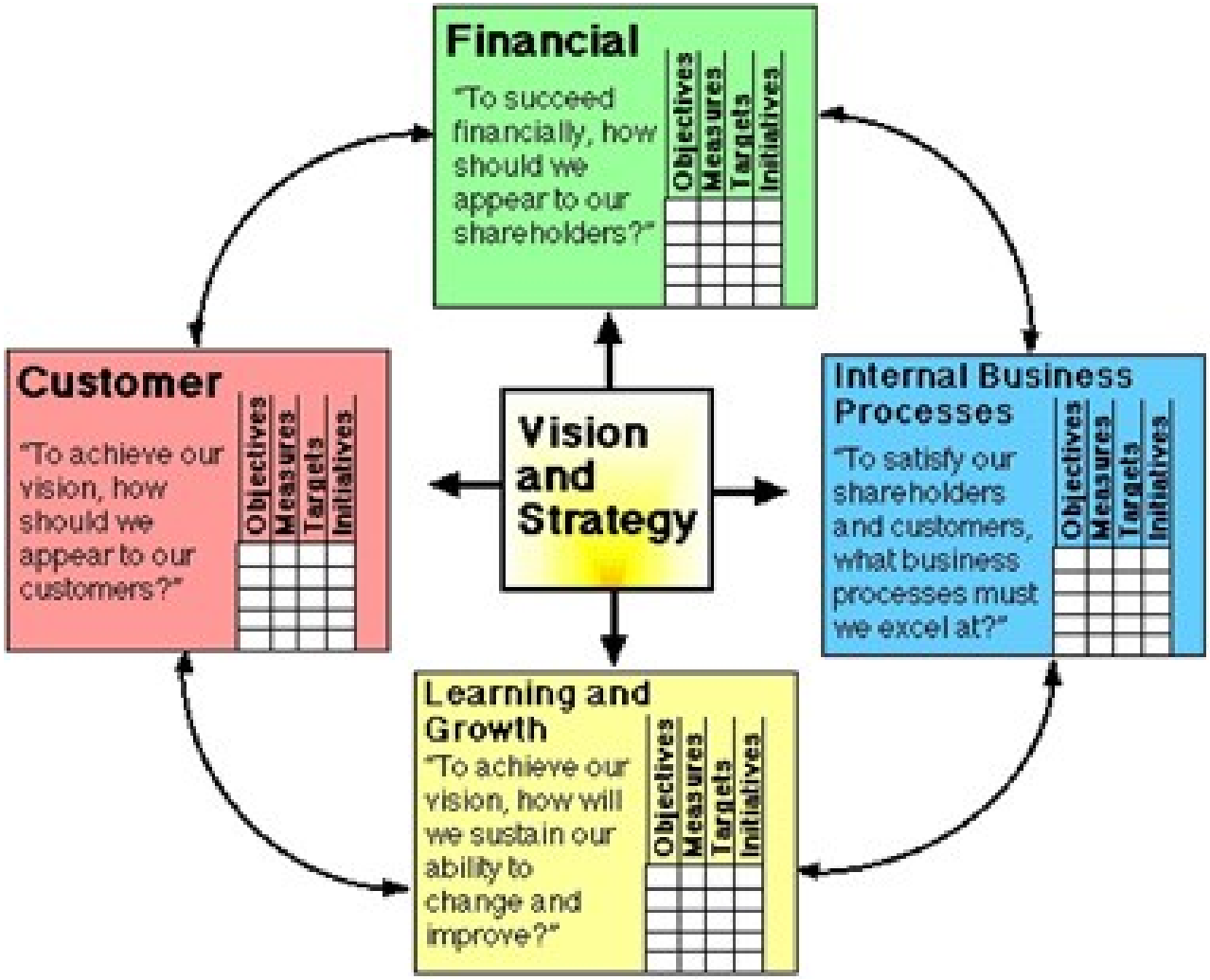
Characteristics of Good Metrics

- Easy to measure
- Clear lever(s) to affect
- Easy to influence, with few side-effects
- Has expected range
- Predictable evolution over time
- Visible alignment with goals (ROI)

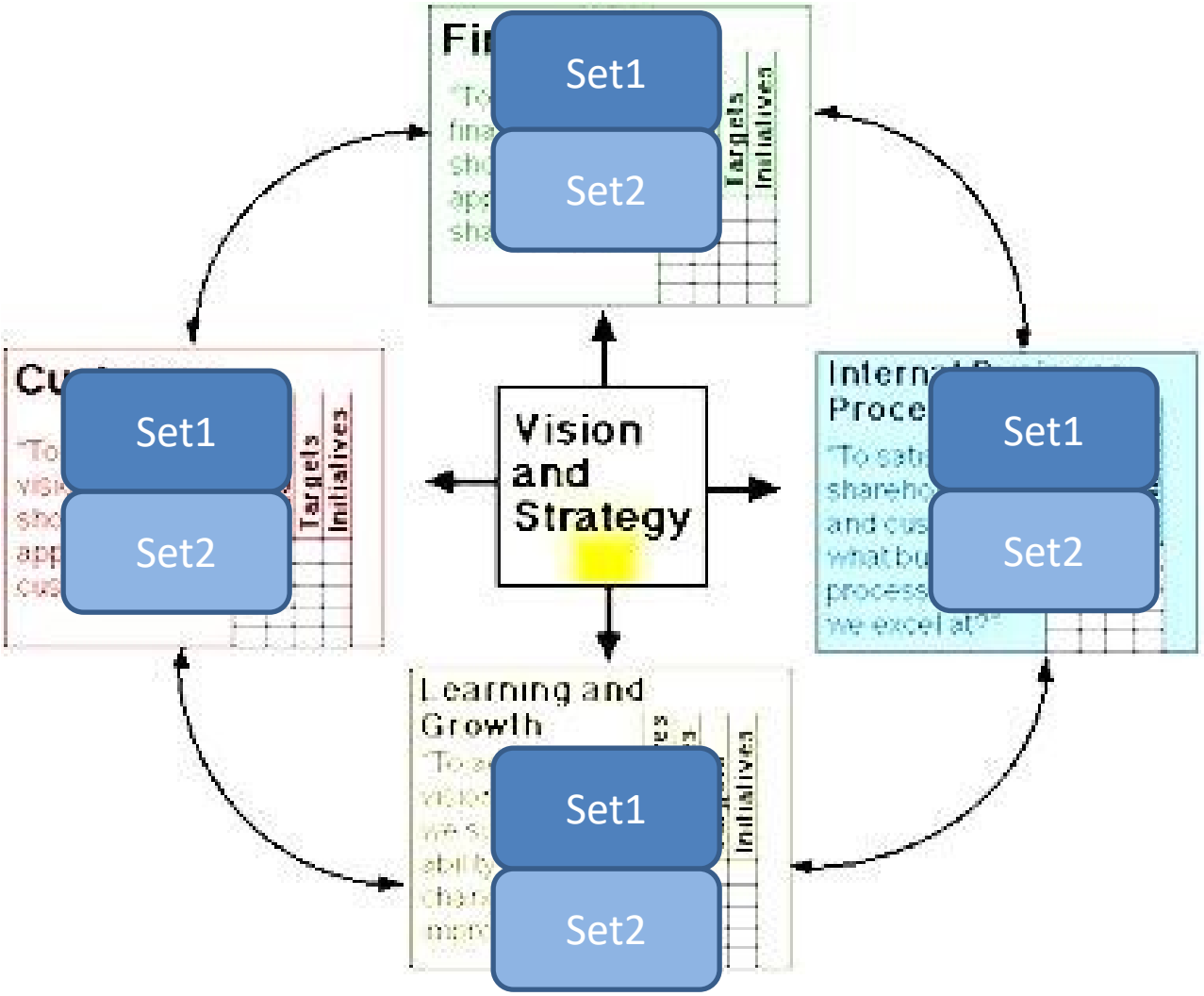
“Source Code Churn”

- Measurement: lines changed/lines code (in %)
- Clearly affected by check-ins
- Easy to influence the right behavior
  - Innovation and technical debt paid early
  - Implementation gets completed near end of cycle
- Expected range predictable
  - M0-M(N-1): >100%
  - MN (Release): Decrease per week down to 0%
- ROI
  - Investment: little or no cost
  - Return: visibility of how much source code is changing

Traditional Balanced Scorecard



Creating the Balanced Scorecard



Example of Set of Balanced Metrics

- Internal Business Process
  - Source code churn (for the project, per period)
- Financial
  - Implementation effort (related to cost)
- Customer
  - Value of features delivered in the period
- Learning and Growth
  - Complexity growth %

Repeating the Message

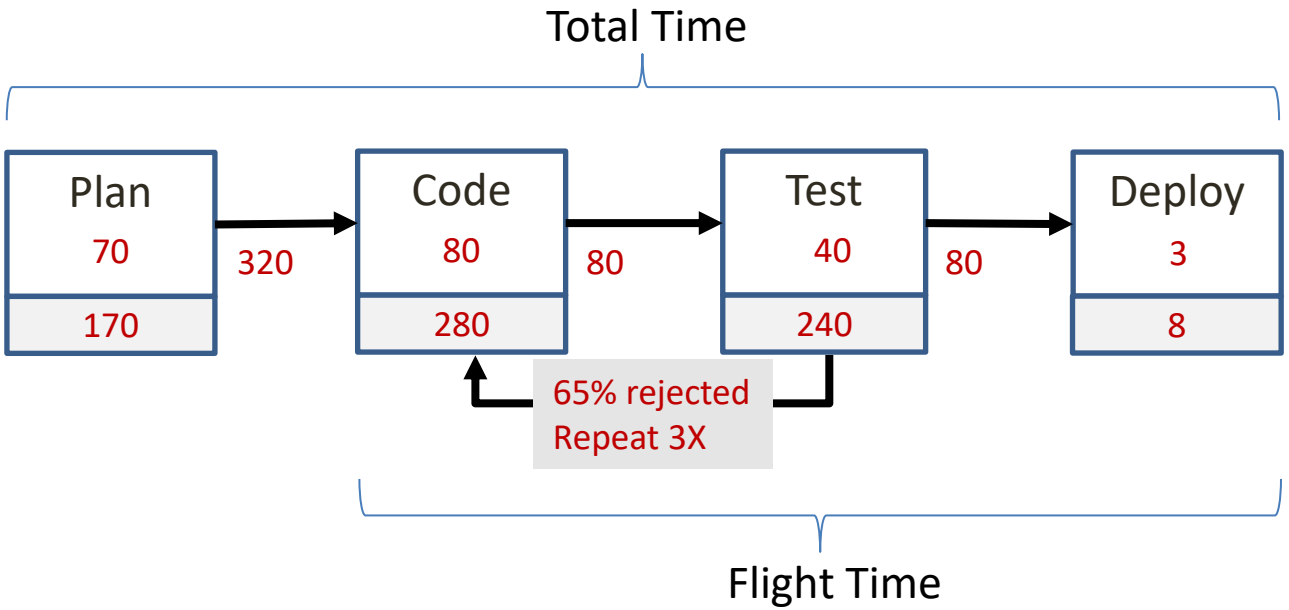
- There is no magic pill for metrics
- Good use of metrics demands discipline for a "full diet"
  - Goals and uncertainties are made visible
  - A framework for selecting metrics is used
  - Measurements made as "practices" are adopted
  - Decision process incorporates metrics
    - Metrics are not "grades"

Appendix

Example: Context

- Online service with content
  - Revenue: ads, subscriptions
- Goal: increase release cadency
- Assumptions
  - Stable, performing team
  - No technology changes
  - No methodology change
  - Will build “flow” diagram
    - Minimize activities that aren’t essential

Value-Stream Mapping Example

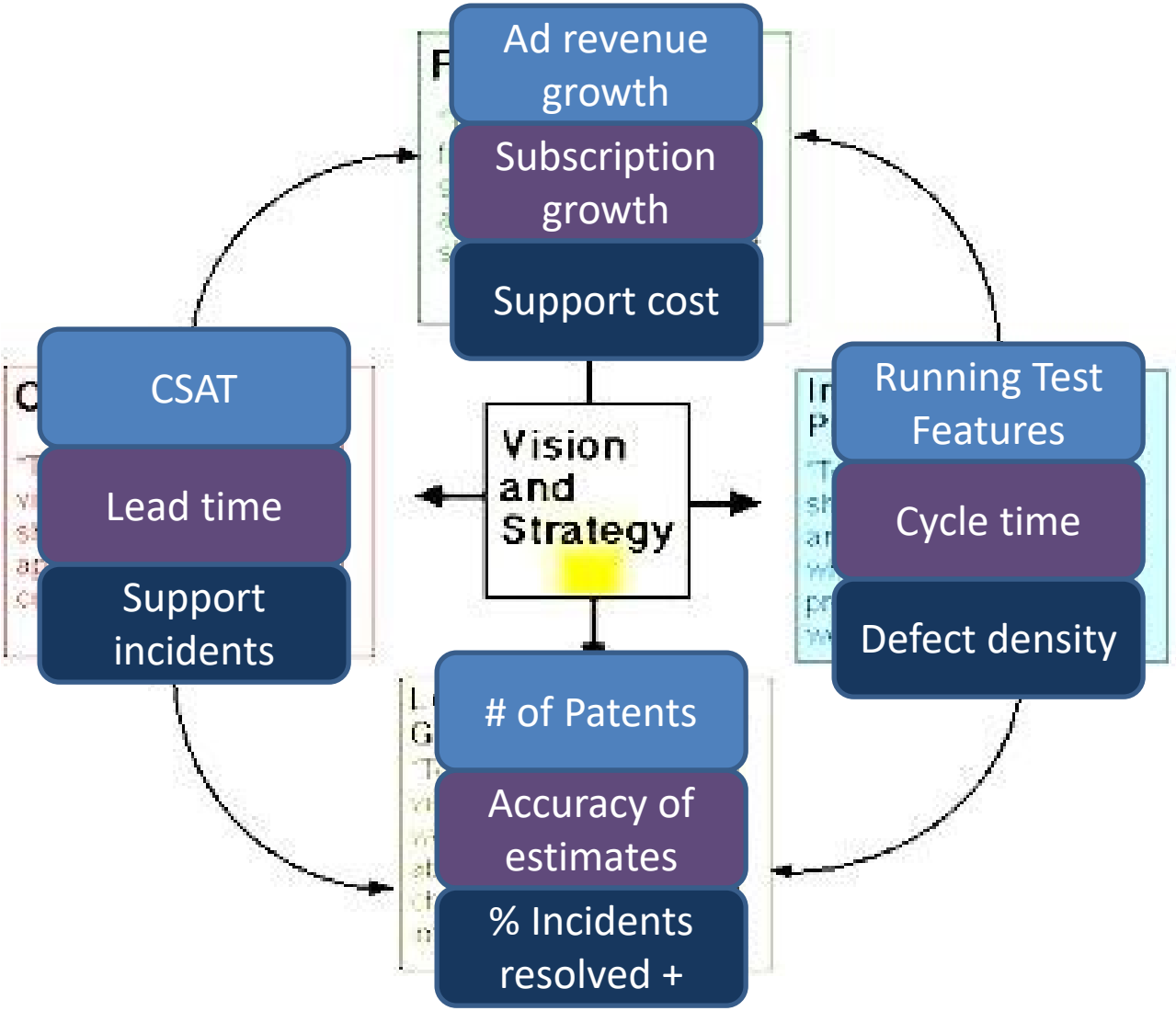


$$\text{PCE} = \frac{427}{2348} = 18.2\%$$

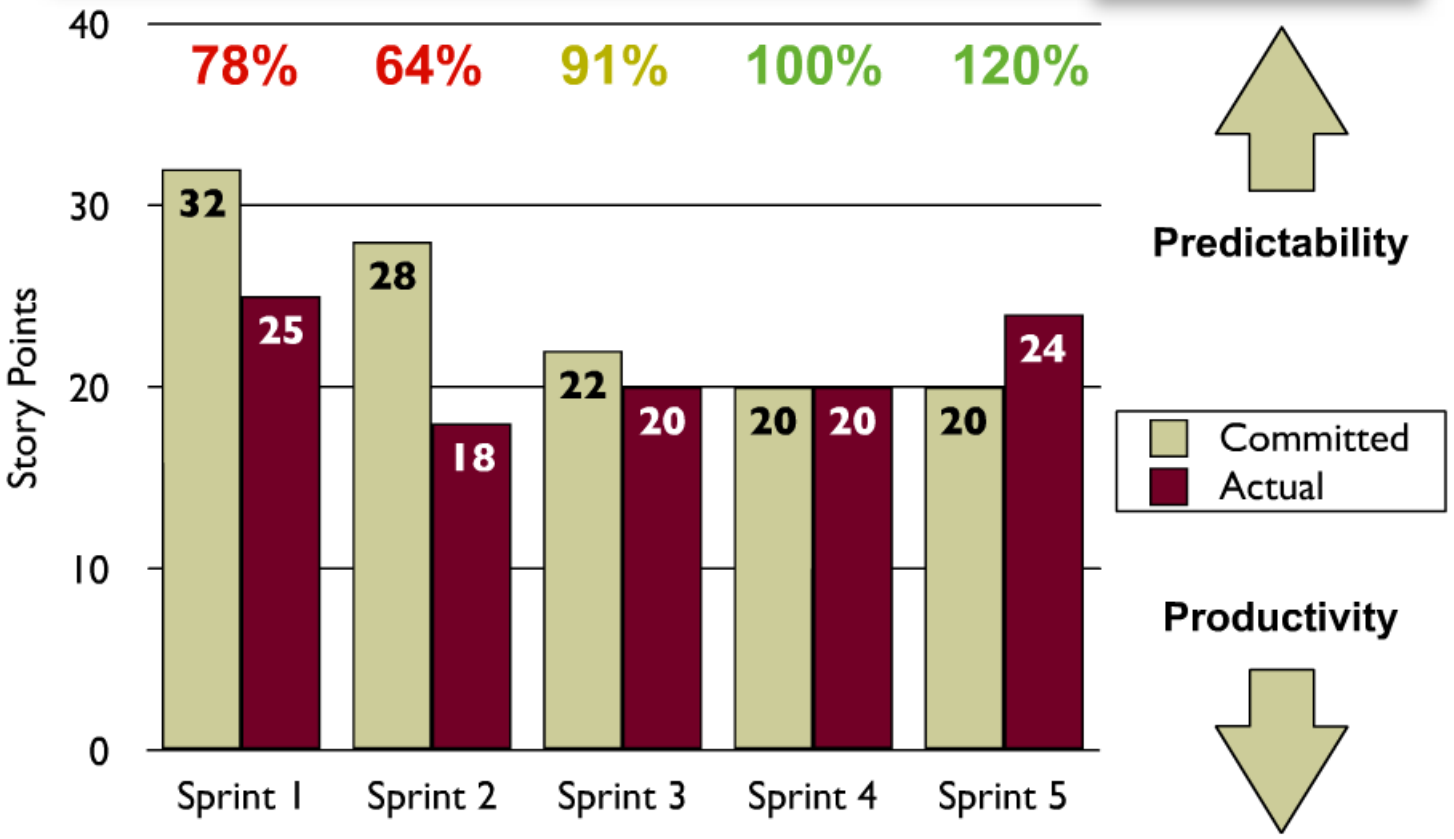
Building the Balanced Scorecard

- Review
  - Customer: How customers perceive us?
  - Financial: How shareholders see us?
  - Internal Business Processes: At what to excel?
  - Learning and Growth: What to learn/invent?
- Choosing metrics
  - When possible, prefer relative values

Example: Scorecard at "Higher Level"



Myth - 100% Committed vs. Actual drives estimation accuracy



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Throughput

Utilization