Chapter 13
Beyond Scope, Schedule, and Cost
Measuring Agile Performance
Moving to Agile… requires work

Six areas:

1. Delivering value over meeting constraints
2. Leading the team over managing tasks
3. Adapting to change over conforming to plans

“An agile leader focuses on adapting successfully to inevitable changes rather than following the plan” … with minimal change expected and/or accepted.

Measuring success by the extent to which the development work adhering to the “scope, schedule, cost” plan will be *dysfunctional*.  

Highsmith

“Our problem is not that we aim too high and miss, but that we aim too low and hit.”

Aristotle
Measuring Agile success …

Value… build a releasable product
Quality… build a reliable, adaptable product
Constraints… Achieve value and quality within acceptable constraints
What is Quality?

Intrinsic quality

... concern about reliability.

Does “it” work the way we, the user, expected (and probably hoped for)?

For those that are to “nurture” the software through its “life”, is it adaptable?

“Organizations think they are okay cutting quality corners because it doesn’t catch up with them immediately, but when it does, the problem is often severe and expansive to fix.

A crucial problem with software is that we often let intrinsic quality slide to meet schedule or scope or cost demands.

The customer may be satisfied – today, but over time customer satisfaction decreases as drastically as technical debt increased.

The ability to deliver value over time can be directly linked to intrinsic quality.
“High-defect density code can easily take 10-15 times longer to test. Because few project plans allow that much time, buggy software is the result.”
“error location dynamics”

“How much money can you spend looking for unfound defects?”

Computer game versus space shuttle’s avionics

Final testing factor:

   Explore the “error-feedback ratio… the number of defects injected when fixing existing defects.

Testing that can never result in high-quality code…

Why?

   High defect density
   Lengthy error location curves
   High error-feedback ratios (errors introduced when fixing existing errors)
Planning and Measuring

Highsmith questions the Standish Group’s assessment of project success – measured by “scope, schedule and cost… implying that actual success rates are not as bad as they report.

… due to their reliance of “scope, schedule, cost” as the true measures of success.

However… the quantity of reports of “software development disasters” supports the “state of the state of the art” of software development.
Adaptive Performance – Outcomes and Outputs

Measurements (assessments) focused on outcomes.

Two key objectives:

1. Focus any enterprise group (team, project team, department division, or company) on a set of desired strategic outcomes.
2. Encourage those groups (project teams) to perform at high levels of output

Three measurement ideas critical to creating an adaptive organization:

- Acknowledge that performance measurement systems impacts agility
- Move from obsessing over time to obsessing to outcomes … and customer value
- Separate outcome performance from output performance

How performance is measured impacts “agility”
Management concern…

… that adaptability will become an excuse for any deviation from plans and all accountability will be lost.

How this can be prevented:

Focus on value delivered through creating a releasable, high quality product ensures performance from the customer/product management (outcome) perspective. Teams should measure success against benchmarks to allow management to monitor output performance.

“The key is focusing on the desired outcomes, not a restrictive plan.”
Measurement Concepts

Concepts that provide the basis for adaptive management systems.

Budgets should not be treated as “fixed performance contracts.”… forcing managers at all levels to commit to delivering specified financial outcomes… even though many of the variables underpinning those outcomes are beyond their control.

The problems with measurement systems:

• Cumbersome and expensive
• Out of kilter with the competitive environment
• “Gaming the numbers” is rampant
Project plans…

“… excruciatingly detailed, based on fuzzy understanding of the project and significant uncertainty.”

“Some project leaders figure they have saved 95% of the time that used to be spend on budgeting and forecasting.”

Fixed budgets or plans are out of kilter … because things change and assumptions are invalidated.

“Fixed targets and an agreed-upon plan may work for low-uncertainty projects and businesses, but for most, “fixed” plans act like a huge anchor on progress – they tie people to the past rather than the future.”
Project plans…

With fixed performance contracts… “gaming the numbers” is rampant.

One company reported in IT literature that it was on time, under budget and met specification 95% of the time. … indicates that the company is not taking on enough risk or they are sandbagging on projects.

“Budgeting and estimating are often hog-tied by politics, and their relationship to real performance remain tenuous at best.”
How Measurement Systems Become Dysfunctional

- Step 1: Measurement system installed.
- Step 2: Performance tends to improve while people figure out the system.
- Step 3: People, under pressure, focus on measurement goals rather than outcomes. (A disconnect between the desired outcome and the measurement. Example: productivity; lines of code.)
- Step 4:
Key Performance Indicators (KPIs)

Used to establish strategic and tactical outcomes desired by companies… and relative performance indicators that measure performance against internal and external benchmarks… rather than fixed budgets and plans. Targets are set and KPIs (ROI, cash flow, customer satisfaction) provide the assessments.

You want to know:

1. Are the strategic and tactical goals of the organization being achieved?
2. Are people performing at the highest levels possible.
Beyond Budgeting Principles

- Provide a governance framework based on clear principles and boundaries.
- Create a high-performance climate based on relative success.
- Give people freedom to make local decisions that are consistent with governance principles and the organization's goals. “Our cases have shown that although teams at every level need strategic direction, they don’t need detailed plans (except those derived by the team to set their own course.”
- Place the responsibility for value creating decisions on front-line teams
- Make people accountable for customer outcomes.
- Support open and ethical information systems.

Jeremy Hope & Robin Fraser (2003)
“One of the primary benefits of managing without a plan or budget is that managers are able to focus all their attention on responding to changing events and providing value to customers and shareholders.”

Companies “need to abandon fixed performance contracts, command-and-control management, the dependency culture, central resource allocation, the multilayered functional hierarchy, and the closed information systems.”
Measuring Performance in Organizations

Rob Austin’s *Measuring and Managing Performance in Organizations*… reference.

“… if there is a single message that comes from this book, it is that trust, honesty, and good intentions are more efficient in many social contexts than verification, guile, and self-interest.”

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**Dysfunctional Measurement Systems**

Step 1: Measurement system installed.
Step 2: Performance tends to improve while people figure out the system.
Step 3: People, under pressure, focus on measurement goals rather than outcomes. (Always a disconnect between the desired outcome and the measurement. Example: (1) productivity; lines of code. (2) productivity; velocity)
Step 4:
Two Management Styles

1. **Motivational measurement** attempts to alter behavior and provoke greater effort from employees.

2. **Informational measurement** provides insights into development and management processes over time.

Austin… “the ideal to which organizations should aspire is one in which workers are internally motivated and measurement provides them with self-assessment information. The challenge for managers is to become more trusting, able to inspire and communicate, and willing to help rather than be helped”
APMS Design Guidelines

• Build the measurement system on a foundation of trust, honesty, and an intent to increase organizational value.
• Place the most emphasis on measuring outcomes, not inputs, even if the metrics are not as easy to obtain, nor as precise.
• Implement constraint metrics with broad tolerance for variations to encourage adaptation.
• Create outcome informational metrics that support people’s innate internal motivational needs and provide them aggregate measures of overall progress.

“The key to a successful transition to an agile organization, project, or enterprise is a focus on customer value rather than schedule, building collaborative project communities based on trust and respect… learning from good feedback systems.”
Outcome Performance Metrics

… providing assurances back to customers that they are obtaining value for their investment by measuring outcomes *first* and *then* performance against constraints.

Is the project community delivering a continuous stream of value to the customer?

Is the project community delivering a high-quality product that can continue to deliver customer value in the future?

Did the project community deliver within acceptable scope, schedule, and cost constraints.
Constraints

Outcomes are a measure of business value…
But businesses require more than outcomes… they require that outcomes be generated with certain constraints to make them financially viable.

“scope, schedule, cost”

Adaptive measurement design requires as few narrow constraints as possible.

One of the three should be “fixed” and the others “flexible or accept” constraints.

Constraints should have broad tolerances to encourage flexibility and experimental design… and thereby innovation.

“The tighter the constraints, the less flexibility the team has, and the less likely it is to deliver on the highest-priority outcomes.”
Community Responsibility

… not just the development team.
The product team and the sponsor make critical priority and resource decisions during the project.
When the sponsor, or other managers, shuffle people from project to project, they are making cross-project resource allocation decisions…

Why should a development team be judged for a resource loss over which they have no control?

“… in traditional projects the product team provides requirements and constraints to the development team, but they don’t have direct accountability for outcomes.

For Agile projects… the entire project community is (should be) an integrated, all committed to the results.
Planning as a Guide

“Plans are used to guide the team, but not to encase them in straightjackets.”

Alternate performance goals…

“You must absolutely deliver this project within the estimate of $100,000 or heads will roll.”

or

“The estimated target cost for this project that we will strive to achieve is $100,000, however the most critical constraint on this project is to deliver the set of capabilities defined by our June delivery schedule, so we are willing to spend up to $125,000 on this project if need be to achieve our desired outcome.

Which statement would motivate you?
Which is more realistic?
Which is liable to get better results?
Output Performance Metrics

• Teams should increase their productivity
• Teams should deliver faster
• Teams should deliver low defect products

Measure these characteristics directly and compare progress against external *and* internal benchmarks.

Management’s job is to provide “informational” metrics so that teams can measure their own performance and work on improvement.

**Formative Assessment**

*not* Summative Assessment
Five Core Metrics

1. **Quality of function** — that is, scope, measured in terms of user stories, use cases, requirements, or features

2. **Productivity** — Expressed as functionality produced for the time and effort

3. **Time** — The duration of the project in calendar months

4. **Effort** — The amount of effort expended in person months

5. **Reliability** — Expressed in terms of defect rate

Scope, schedule and cost used to measure outcomes and outputs… compared to other projects.

The SLIM model: tool
Data collection… allows teams to:

- Compare its progress over time against itself
  Are we getting better?
- Compare performance against other internal teams
  How do we compare with others in our organization?
- Compare performance against an external measure of like industries.
  How do we compare with other companies?

Self-organizing teams need these assessments, otherwise self-organizing is treated unrealistically…like an on/off switch.
Outcomes and Outputs

Should not be viewed independently.

“when people feel they are responsible only for outputs, outcomes will inevitably suffer.

… when people feel they have some influence of outcomes… that outcomes are important and accountability for those outcomes is shared by the entire project community, they will act accordingly.

… if outcomes are not viewed as crucial and measurable, output measures dominate… the result is that desired performance and measured performance move in opposite and dysfunctional directions.”
Shortening the *Tail*

The tail is the time period from “code slush” (true code freezes are rare) or “feature freeze” to Release to Manufacturing (RTM).

The time for beta testing, regression testing, product integration, integration testing, documentation, defect fixing…

Agile teams promise shippable software every iteration… however, extra work is usually needed.
What to do to reduce the Tail?

• Learn how to do continuous integration across the entire product
• Improve the level of automated testing to drive regression and integration testing back into every iteration
• Bring customers into the development process much earlier, not waiting until the end for beta testing.
• Integrate documentation specialists into the team and produce documentation contiguously during iterations.
• Invest in systematic refactoring to reduce the technical debt and hence reduce testing and defect time.
The Shortening the **Tail** metric

A metric that embodies the quality values of agile development.
Final Note

“We have to be as innovative with our measurement systems as we are with our development methodology.”

“Build the measurement system on a foundation of trust, honesty, and an intent to increase organizational value.”