Practical Reporting Metrics for Scrum Projects

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What will we achieve today ...

**Presentation Goal 1:**
As a Scrum Master, I want to learn about 10 practical and reliable key performance indicators that will enable me to demonstrate progress and project delivery performance of my agile project.

**Presentation Goal 2:**
As a Scrum Alliance Conference Attendee, I want to gain a high practical knowledge impact by attending a session that elaborates on the theory of scrum metrics which is supported by real life examples and could involve me in practical exercises that will challenge and support me in my workplace.
Learning Objectives

• Understand the value of effective metrics

• Identify some useful and efficient measures for Agile project management.

• Know the difference between raw data and rate of change

• How to apply simple EVM in an agile project

• Measuring progress, quality and culture performance

• As a Scrum Master why do I need to measure?

• What are the most basic metrics that I need?

• What do I need to forecast performance trends of my Agile project?

• Can I apply Earned Value Management in Agile.

• What about quality and culture metrics?
Some rationale for using Agile methods

1. Reduce errors being delivered to User Acceptance Testing by 50%
   - Focus on Continuous Integration (CI) / Continuous Deployment (CD) with automated testing

2. Reduce Cycle Time (Concept to Cash, Time to Market) from 24 months to 26 weeks
   - Focus on requirements and project initiation

3. Improve ability to deliver business value to plan
   - Focus on product ownership, scrum and measurement of progress
Why measure at all?

If a measurement happens at all, it is because it must have some conceivable effect on decision and behavior.

If we can't identify what decision and behaviour could be affected by a proposed measurement and how that measurement could change them, then the measurement simply has no value.

“How to Measure Anything” By Douglas W. Hubbard
Agile project reporting

- Project reporting employ three categories of key performance indicators:
  - **Lagging Indicators** inform the project manager of where the project has been or how the project was doing in the past.
  - **Current Indicators** show how the project is performing today.
  - **Leading Indicators** enable the project manager to know what areas are likely to become troublesome or when a project will be complete. These attempt to act as predictors of future behaviour.

- Lagging Indicators include Defect Status (Open, Close, Deferred), Defect Aging, Sprint Burn-down (Velocity) charts, etc.
- Current Indicators include Budget reports showing costs YTD, User story delivered to MVP (Min Value Proposition)
- Leading Indicators include Defect closure rate, Project progress (burnup).
Desired Agile project reporting details

An understanding of the mid term roadmap and a view of where a feature sits in terms of readiness to execute

What for: To understand which features are ready to play or ready to deploy.
Why: Comfort that there is sufficient work in the mid range plan ready for the teams to pull into their backlogs

Number and scale of blocked features

What for: To identify constraints in the delivery system
Why: To understand the cycle priorities and impacts

Defects created per iteration as % Total Defects

What for: To establish quality standards and severity
Why: As an opportunity to remediate issues early

Defect “KILL” or resolution rate

What for: Ratio of defects created versus fixed.
Why: Focus on remediating errors and issues early

Feature view of MVP colour coded to show progress

What for: To demonstrate progress to MVP
Why: To show Value Focused delivery by prioritising the critical features & stories to deliver the value.

Unit test coverage

What for: To promote higher quality of coding standard
Why: To identify points of failure for bad code
10 useful metrics for Agile Projects

1. **Sprint goal success.**
   Did we deliver to the goals?

2. **UAT Defect.**
   Is the UAT defect rate / 100 story point increasing? If so, What is the rate of increase?

3. **Time-to-Market**
   What is the progress towards MMP? Story Pts / sprint or % Business Value / sprint

4. **Return on Investment.**
   RoI for each release

5. **Agile Readiness Culture**
   Team culture performance

6. **Resource Burn Rate**
   Story points delivered per FTE resource

7. **Release Burn Rate**
   Cumulative Story points delivered as % of backlog baseline

8. **Product Innovation**
   Number of new product features in story points that are delivering business revenue.

9. **Product Satisfaction**
   Survey to gauge acceptance or product owner satisfaction for completed stories.

10. **Estimation**
    Development effort per story point measured in hours categorised by complexity.
10 useful metrics for Agile Projects

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9. **Team member turnover**
   Duration of tenure

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    Is the UAT defect rate / 100 story point increasing? If so, What is the rate of increase?
Rate of Change or Raw Data

The Average Rate of Change function describes the average rate at which one quantity is changing with respect to something else changing.

\[
\text{Rate of Change} = \frac{f(B) - f(A)}{x(B) - x(A)}
\]

**Raw Data:**
- Number of kilometres travelled
- Number of litres of petrol consumed
- Time to travel from Shanghai to Beijing
- Kilowatts of electricity

**RoC Common examples:**
- **Km per litre** - calculated by dividing the number of km by the number of litres used
- **Cost per kilowatt** - calculated by dividing the cost of the electricity by the number of kilowatts used
- **Miles per hour** - calculated by dividing the number of miles travelled by the number of hours it takes to travel them.
Lagging Indicators

**Pros:**
- Data is a reflection of what has occurred
- Reliable actual picture of reality

**Cons:**
- Do not provide information of what is likely to happen
- Do not point to the causal effects

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### Current Indicators

**Pros:**
- Data is a reflection of what is occurring
- Highlight issues and areas of concerns
- Reliable actual picture of reality

**Cons:**
- Do not provide information of what is likely to happen
- Do not point to the causal effects
Cumulative Flow Diagram

Current Indicators

Pros:
• Data is a reflection of what is occurring
• Identify potential areas of concerns
• Reliable picture of reality

E.g. Cumulative Flow Diagram

Cons:
• Do not provide granular details of each causal effect.
Cumulative Flow Diagram

Commentary:
First thing to remember when looking at a CFD:
Check if the work in progress area grows or rather stays constant over time. If it is constant or decreasing, you are most likely doing good, and if it is growing then you need to dig deeper. If work conditions (team size, project type, company environment) have not changed, but work in progress is growing, you may have an issue to deal with.

Second thing to remember when looking at a CFD:
Check how your average Lead/Cycle times are changing over time. Just draw a horizontal line between the To Do / Done or In progress / Done and take the delta in time. If they is growing, you are in trouble. If they go down, your customers are probably the happiest people on earth.
Release Burn Chart

Leading Indicators:
- Data is a reflection of what is occurring
- Highlight issues and areas of concerns
- Reliable picture of reality
- Identifies future trends and important breaks in project development

E.g. Moving Average & Linear Trend lines

Cons:
- Do not provide granular details of each causal effect.

Release Burnup Chart with % Cumulative delivery Trend

Pros:
- Simple and accessible visual representation of project progress
- Easy to understand and interpret for stakeholders
- Provides a clear framework for tracking project milestones

Leading Indicators:
- Proactive monitoring of project progress
- Enables early detection of potential issues
- Facilitates informed decision-making

Cons:
- Lacks detailed insight into individual project components
- May not capture all nuances of project performance

Release Burn Chart

Estimate provide 26/03/2015
Baseline 1160 Pts

Credit Cards Complete

% Cumulative Delivery Linear Trend

% Cumulative Delivery 2-period Moving Average

Planned Value

Percentage of Product Backlog as of 26 March 2015

ANZ.com Redesign (Content Capability) Release Burn Chart

Planned Story Pts
- Delivered Story Pts
- Remaining Story Points
- 2 per. Mov. Avg. (% Cumulative Delivery)

Credit Cards Complete

% Cumulative Delivery Linear Trend

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Business Value Metric

- **Goal to** Create an Authorable AEM Page represents 30% of a business case.
- **Feature** Create Page Template represents 10% of Goal value.
- **User Story** Create a Product Basic Page template realizes 10% of Feature value.
- **% Value Realised** = \(0.3 \times 0.1 \times 0.1 = 3\%\) when the basic page template is done.

**GOAL**

Create an authorable AEM page

**FEATURE**

- Create Page Template 0.1
- Create AEM Components 0.2

**USER STORY**

- Create a Product Basic Page Template 0.1
- Create Global Footer 0.05
- Create a Product Premium Page Template 0.1

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Leading vs lagging Indicators

**Leading Indicators**
- Forward looking
- Used as a predictive mechanism
- Useful in identifying potential break points when a project may be in jeopardy or delays to completion
- Can provide a forward looking assessment of quality, cost and schedule prediction
- May indicate points at which adjustments need to be made to funding, resources and scope

**Lagging Indicators**
- Backward looking
- Provide a current view of progress
- Provide historical trends that may indicate potential problems
- Not useful in themselves but can be abstracted to provide predictive indicator trend lines
- Used most often to provide current project status reports.
Challenges with Leading Metrics

- Must be specifically designed to be relevant, consistent and reliable.
- Should be captured as part of normal work.
- Beware that what is measured does not effect the results in a way that encourages gaming of the measure.
- Leading indicators should be designed to identify the issues and areas of risks in a consistent and reliable manner.
- Comparative analysis and reporting of cost and schedule metrics can be more effective by using % ratios:
  - % Cumulative Delivery
  - % Budgeted Cost
Does Earned Value Management have a place in Agile projects

• What is Earned Value Management?

• Is EVM a lagging or leading indicator?

• How can EVM be adapted for Agile?

• Can EVM be incorporated into a Release Burn charts?

• Rusk, J., DoD Software Tech News, Vol. 12, No. 1

• http://www.agilekiwi.com/EarnedValueForAgileProjects.pdf
What is EVM?

“Agile and earned value management (EVM) are a natural fit for each other. EVM implementations can be radically simplified for agile projects”
John Rusk, 2009

Earned value management (EVM) is a project management technique for measuring project performance and progress in an objective manner.

- Focuses on 3 elements: Scope, Cost and Schedule
- Agile scope is represented by your Product Backlog
- Cost for software development is measured by Time (Labour Hours)
- Schedule is represented by the Iteration or Sprint Interval (2 – 4 weeks)
- Planned Value is your forecast or planned delivery of story points
- Earned Value is represented by actual delivery achieved in story points
- Actual Cost is the effort measured in hours expended.
Release Burn Chart

Story Points to achieve MMP 800 Points

% Cumulative Delivery

2-period Moving Average

Planned Value

Credit Cards Complete

% Cumulative Delivery Linear Trend

Estimate provide 26/03/2015
Baseline 1160 Pts

Component Loan Complete

% Cumulative Delivery

Planned Story Pts

Delivered Story Pts

Remaining Story Points

% Planned Delivery

% Cumulative Delivery

2 per. Mov. Avg. (% Cumulative Delivery)

Baseline

0

200

400

600

800

1000

1200

Percentage of Product Backlogs as of 26 March 2015

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

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Testing Release Chart
Interpreting the Feature Epics vs. MVP

MMP mapped over Feature Story

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Future Dated Payments: Total Scope vs MVP Progress
Epic Report from Atlassian JIRA

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Cumulative Flow Diagram

Cycle time

Work in Process
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Agile Readiness Assessment