Measuring Flow: Metrics that Matter

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Agenda

• Why is flow so important?

• How do we measure flow?

• Practice!
Utilization vs. Flow

What’s the difference?
Prioritizing Utilization

Fully utilized, but spend most of the time waiting

Slow flow through the system

Slow to respond to change
Prioritizing Flow

Work almost always moving

Rapid flow through the system

Short response time reduces effect of impediments
Measuring Flow
First, a couple questions...

Who uses?

• Scrum?
• Kanban?
• Other?

What metrics do you use?
Lead and Cycle Time

How long from start to finish?
What it measures

- Backlog
- Ready
  - Doing
  - Done
- Develop
- Validate
  - Doing
  - Done
- Done

Lead Time
Cycle Time
### How to collect

<table>
<thead>
<tr>
<th>Backlog</th>
<th>Ready</th>
<th>Develop</th>
<th>Validate</th>
<th>Done</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Doing</td>
<td>Doing</td>
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<tr>
<td></td>
<td></td>
<td>Done</td>
<td>Done</td>
<td></td>
</tr>
</tbody>
</table>

**Cycle Time**

- **US1: Customer Dashboard**
  - **Start:** 5/14
  - **Finish:** 5/17
  - **HT**
Average and Median Cycle Time

**What:**
- **Average**: The arithmetic mean (adding a group of numbers and dividing by the count of those numbers)
- **Median**: The middle number of a group of numbers

**Why:**
Helps visualize trends and provide data for predicting delivery
 Cycle Time Distribution

**What:**
Shows how many occurrences there have been of each cycle time

**Why:**
Differentiate between trends and outliers. May help explain differences between average and median cycle time
Cycle Time Scatter Plot

**What:**
Shows cycle time of individual work items in the order completed

**Why:**
Reflects cycle times within iterations and when outliers occurred
Use in Scrum & Kanban

Central to Kanban to show progress in lieu of sprints

Useful in Scrum to promote flow within a sprint to avoid “hockey stick” shaped burndown
Throughput

How many items in a given period of time?
What it measures & how to collect

**What:**
Number of work items completed in a given length of time

**Why:**
Predict how long to complete a given set of work
Get a sense of team stability
Comparison to Velocity

**Similarities**

- Team delivery over time
- Provides predictability

**Differences**

- Independent of work item size
- Not tied to a sprint
- Simplicity of collection
Cumulative Flow Diagram

How is work moving along?
What it measures

**What:**
Number of work items in a given status over time

**Why:**
Highlights bottlenecks, visualizes amount of work in progress and cycle time, shows end-to-end flow through system
How to collect

Day | Analysis | Ready | Develop | Accept | Done |
--- | --- | --- | --- | --- | --- |
1 | 4 | 5 | 2 | 0 | 0 |
2 | 4 | 4 | 3 | 0 | 0 |
3 | 4 | 4 | 3 | 0 | 0 |
4 | 8 | 4 | 3 | 0 | 0 |
5 | 7 | 5 | 2 | 2 | 0 |
6 | 7 | 5 | 2 | 2 | 0 |
7 | 6 | 6 | 1 | 1 | 2 |
8 | 4 | 8 | 0 | 1 | 3 |
9 | 5 | 8 | 0 | 1 | 3 |
10 | 5 | 4 | 3 | 2 | 4 |
Comparison to Burndown Chart

Independent of work item size and iteration

Gives insight into bottlenecks on intermediate steps

Accounts for changes in scope

Shows WIP and cycle time in context
Time to practice!

In small groups
Review sample charts in small groups and discuss:

- What does this chart tell you about the team’s flow? What trends do you see?
- What questions would you want to ask this team to learn more?
- What are some possible explanations?
- What are some ideas for improvement?
Throughput

<table>
<thead>
<tr>
<th>Work Items Completed</th>
<th>Week</th>
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<tr>
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<td>15</td>
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Cycle Time Distribution
Cycle Time Scatter Plot

-轴：用户故事号
-轴：周期时间

蓝点：用户故事
黄点：缺陷
红点：加急
Wrapping it up

And some additional resources
• Visualizing and understanding flow is essential, regardless of Agile approach used

• Lead and cycle time, throughput and CFDs are relatively simple to collect

• Flow-based metrics provide deeper insight without sacrificing usefulness for predictability and planning

• Can be applied to end-to-end processes beyond the team
Additional Resources

- Burndown Charts vs Cumulative Flow Diagrams
- 7 Lean Metrics to Improve Flow
- Lean Metrics: Measure Predictability with Facts over Estimates
- Using Flow Metrics to Deliver Faster
- More Cumulative Flow Diagrams
Questions?