Making Better Business Decisions with Flow Metrics

Dominica DeGrandis, Director Digital Transformation
Author of Making Work Visible: Exposing Time Theft
WHAT’s THE POINT?

- Few compelling sets of data to visualize at biz level
- Delivering value to customers quickly requires fast, smooth flow of work
- Flow metrics help you improve business decisions
Barclays’ Value Stream

we are so freaking AGILE, yay!

Idea Triage | Outline biz case | Waiting 4 Steering | Detail biz case | Waiting 4 Approval | Product Backlog | Analysis | Dev Backlog | Next | Waiting 4 Integration | Waiting 4 Acceptance | Waiting 4 Release | Done

monthly | quarterly | annual

monthly | quarterly

Image taken with permission from Jon Smart presentation at DOES London 2018 – credit Klaus Leopold
5 FLOW METRICS:

Why, How, + considerations

- Flow Time: A measure of speed
- Flow Velocity: A measure of throughput
- Flow Distribution: A measure to see tradeoffs
- Flow Load: Amount of Work-in-Progress (WIP)
- Flow Efficiency: Work vs. wait time ratio
Flow Distribution: A measure to see tradeoffs

Make tradeoffs clear – help set strategic direction
Neglected work is partially completed work that gets postponed. It's work that sits idle on the bench waiting for attention. Neglected work is a time thief because it either gets in the way of higher value work or it delays the delivery of important work.
Flow Metrics Exercise

Time: 5 min

Materials:
1. Flow Metrics Data sheet
2. Flow Distribution Chart

Flow Metrics Exercise Data

<table>
<thead>
<tr>
<th>Work Item Types</th>
<th>Day Done</th>
<th>Day Approved</th>
<th>Flow time (#days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>feature</td>
<td>9-Sep-18</td>
<td>3-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>tech debt</td>
<td>9-Sep-18</td>
<td>29-Aug-18</td>
<td>11</td>
</tr>
<tr>
<td>feature</td>
<td>9-Sep-18</td>
<td>27-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>defect</td>
<td>10-Sep-18</td>
<td>1-Sep-18</td>
<td>9</td>
</tr>
<tr>
<td>feature</td>
<td>10-Sep-18</td>
<td>4-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>feature</td>
<td>11-Sep-18</td>
<td>6-Sep-18</td>
<td>5</td>
</tr>
<tr>
<td>defect</td>
<td>11-Sep-18</td>
<td>5-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>defect</td>
<td>11-Sep-18</td>
<td>3-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>tech debt</td>
<td>12-Sep-18</td>
<td>30-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>risk</td>
<td>12-Sep-18</td>
<td>10-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>feature</td>
<td>12-Sep-18</td>
<td>6-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>feature</td>
<td>13-Sep-18</td>
<td>5-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>defect</td>
<td>15-Sep-18</td>
<td>5-Sep-18</td>
<td>10</td>
</tr>
<tr>
<td>risk</td>
<td>15-Sep-18</td>
<td>13-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>feature</td>
<td>16-Sep-18</td>
<td>15-Sep-18</td>
<td>1</td>
</tr>
<tr>
<td>feature</td>
<td>18-Sep-18</td>
<td>18-Sep-18</td>
<td>0</td>
</tr>
<tr>
<td>tech debt</td>
<td>20-Sep-18</td>
<td>8-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>feature</td>
<td>19-Sep-18</td>
<td>6-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>risk</td>
<td>20-Sep-18</td>
<td>18-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>feature</td>
<td>22-Sep-18</td>
<td>11-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>feature</td>
<td>21-Sep-18</td>
<td>9-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>feature</td>
<td>21-Sep-18</td>
<td>10-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>feature</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>tech debt</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
</tbody>
</table>

This work is licensed under the Creative Commons Attribution-ShareAlike 4.0
To view a copy of this license, visit http://creativecommons.org/licenses/by-sa/4.0/

Dominica DeGrandis
www.ddegrandis.com
Flow Metrics Exercise

Time: 5 min

Split into groups of 3:

If no colored markers, then be creative with shading: stripes, dots, diagonal lines, etc…

For each day, calculate and draw one vertical bar showing the distribution of work item types. Use the same color marker as the color of the work items.

Ex: If one Feature work item and one Defect work item were delivered on Day 9, then 50% of the vertical bar for Day 9 would be blue (feature) and 50% would be orange (defect).
What story is told based on the outcomes shown in this chart?

Flow Distribution Chart Instructions: For each day, calculate and draw one vertical bar showing the distribution of work item types. Use the same color marker as the color of the work items.

Ex: If one Feature work item and one Defect work item were delivered on Day 9, then 50% of the vertical bar for Day 9 would be blue (feature) and 50% would be orange (defect).
## Flow Distribution allocation

<table>
<thead>
<tr>
<th>Features</th>
<th>Next</th>
<th>Design</th>
<th>Build</th>
<th>Feedback</th>
<th>Deliver</th>
<th>Verify</th>
<th>Value</th>
<th>Delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**WIP limit**

- Features: 5
- Defects: 5
- Risks: 1
- Debts: 3
Flow Time – a measure of speed

Flow Time: The duration from when work enters the value stream to its completion.

Yes, let’s do this!
Unplanned Work:
- Delays planned work
- Steals your predictability

The enemy of getting work done is not you're lack of talent - it's being interrupted.
Measuring Flow Time

Unplanned work delays
Planned work
Flow Metrics Exercise

Time: 5 min

Materials:
1. Flow Metrics Data sheet
2. Flow Time Chart

<table>
<thead>
<tr>
<th>Work Item Types</th>
<th>Day Done</th>
<th>Day Approved</th>
<th>Flow time (#days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 feature</td>
<td>9-Sep-18</td>
<td>3-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>2 tech debt</td>
<td>9-Sep-18</td>
<td>29-Aug-18</td>
<td>11</td>
</tr>
<tr>
<td>3 feature</td>
<td>9-Sep-18</td>
<td>27-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>4 defect</td>
<td>10-Sep-18</td>
<td>1-Sep-18</td>
<td>9</td>
</tr>
<tr>
<td>5 feature</td>
<td>10-Sep-18</td>
<td>4-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>6 feature</td>
<td>11-Sep-18</td>
<td>6-Sep-18</td>
<td>5</td>
</tr>
<tr>
<td>7 defect</td>
<td>11-Sep-18</td>
<td>5-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>8 defect</td>
<td>11-Sep-18</td>
<td>3-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>9 tech debt</td>
<td>12-Sep-18</td>
<td>30-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>10 risk</td>
<td>12-Sep-18</td>
<td>10-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>11 feature</td>
<td>12-Sep-18</td>
<td>8-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>12 feature</td>
<td>13-Sep-18</td>
<td>5-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>13 defect</td>
<td>15-Sep-18</td>
<td>5-Sep-18</td>
<td>10</td>
</tr>
<tr>
<td>14 risk</td>
<td>15-Sep-18</td>
<td>13-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>15 risk</td>
<td>16-Sep-18</td>
<td>15-Sep-18</td>
<td>1</td>
</tr>
<tr>
<td>16 risk</td>
<td>18-Sep-18</td>
<td>18-Sep-18</td>
<td>0</td>
</tr>
<tr>
<td>17 tech debt</td>
<td>20-Sep-18</td>
<td>8-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>18 feature</td>
<td>19-Sep-18</td>
<td>6-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>19 risk</td>
<td>20-Sep-18</td>
<td>18-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>20 feature</td>
<td>22-Sep-18</td>
<td>11-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>21 feature</td>
<td>21-Sep-18</td>
<td>9-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>22 feature</td>
<td>21-Sep-18</td>
<td>10-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>23 feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>24 feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>25 feature</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>26 tech debt</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
</tbody>
</table>
Flow Time and Flow Velocity (Throughput) Chart

**Flow Time Chart Instructions:** Plot 1 dot per completed work item, using the same color marker as the color of the work item. Do not connect the dots.

**Flow Velocity Chart Instructions:** Draw one vertical bar per day (above the Flow Time chart) to create a histogram that shows the number of work items completed for each day.

Complete just the “Flow Time Chart” Instructions.

Save the “Flow Velocity Chart” portion for later.

Time: 5 min
What story is told based on the outcomes shown in this Flow time chart?
“Be approximately right instead of exactly wrong”.  ~ John Tukey
Flow Velocity: A measure of throughput

A decision to do one thing is a decision to delay something else.
People have a finite amount of capacity
Measuring Flow Velocity
Flow Metrics Exercise

Time: 3 min

Materials:
1. Flow Metrics Data sheet
2. Flow Velocity Chart

Flow Metrics Exercise Data

<table>
<thead>
<tr>
<th>Work Item Types</th>
<th>Day Done</th>
<th>Day Approved</th>
<th>Flow time (#days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 feature</td>
<td>9-Sep-18</td>
<td>3-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>2 tech debt</td>
<td>9-Sep-18</td>
<td>29-Aug-18</td>
<td>11</td>
</tr>
<tr>
<td>3 feature</td>
<td>9-Sep-18</td>
<td>27-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>4 defect</td>
<td>10-Sep-18</td>
<td>1-Sep-18</td>
<td>9</td>
</tr>
<tr>
<td>5 feature</td>
<td>10-Sep-18</td>
<td>4-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>6 feature</td>
<td>11-Sep-18</td>
<td>6-Sep-18</td>
<td>5</td>
</tr>
<tr>
<td>7 defect</td>
<td>11-Sep-18</td>
<td>5-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>8 defect</td>
<td>11-Sep-18</td>
<td>3-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>9 tech debt</td>
<td>12-Sep-18</td>
<td>30-Aug-18</td>
<td>13</td>
</tr>
<tr>
<td>10 risk</td>
<td>12-Sep-18</td>
<td>10-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>11 feature</td>
<td>12-Sep-18</td>
<td>6-Sep-18</td>
<td>6</td>
</tr>
<tr>
<td>12 feature</td>
<td>13-Sep-18</td>
<td>5-Sep-18</td>
<td>8</td>
</tr>
<tr>
<td>13 defect</td>
<td>15-Sep-18</td>
<td>5-Sep-18</td>
<td>10</td>
</tr>
<tr>
<td>14 risk</td>
<td>15-Sep-18</td>
<td>13-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>15 risk</td>
<td>16-Sep-18</td>
<td>15-Sep-18</td>
<td>1</td>
</tr>
<tr>
<td>16 risk</td>
<td>18-Sep-18</td>
<td>18-Sep-18</td>
<td>0</td>
</tr>
<tr>
<td>17 tech debt</td>
<td>20-Sep-18</td>
<td>8-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>18 feature</td>
<td>19-Sep-18</td>
<td>6-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>19 risk</td>
<td>20-Sep-18</td>
<td>18-Sep-18</td>
<td>2</td>
</tr>
<tr>
<td>20 feature</td>
<td>22-Sep-18</td>
<td>11-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>21 feature</td>
<td>21-Sep-18</td>
<td>9-Sep-18</td>
<td>12</td>
</tr>
<tr>
<td>22 feature</td>
<td>21-Sep-18</td>
<td>10-Sep-18</td>
<td>11</td>
</tr>
<tr>
<td>23 feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>24 feature</td>
<td>22-Sep-18</td>
<td>8-Sep-18</td>
<td>14</td>
</tr>
<tr>
<td>25 feature</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
<tr>
<td>26 tech debt</td>
<td>23-Sep-18</td>
<td>10-Sep-18</td>
<td>13</td>
</tr>
</tbody>
</table>

This work is licensed under the Creative Commons Attribution-ShareAlike 4.0
To view a copy of this license, visit http://creativecommons.org/licenses/by-sa/4.0/

Dominica DeGrandis
www.ddegrandis.com
Flow Time Chart Instructions: Plot 1 dot per completed work item, using the same color marker as the color of the work item. Do not connect the dots.

Flow Velocity Chart Instructions: Draw one vertical bar per day (above the Flow Time chart) to create a histogram that shows the number of work items completed for each day.
What story is told based on the outcomes shown in this Flow time chart?
Flow Load: Amount of Work-in-Progress (WIP)

Flow Load:
All the partially completed work.
All the work-in-progress (WIP) in the value stream
Too much WIP comes from too much Yes
Teams within and across teams

Problem:
All the thieves across all these teams.
It's hard to see the big picture impact.
The Rise of the Full Stack Engineer

DevOps - you build it you run it - that means you need full stack engineers, right?

- Web Browser Performance
- Network Access
- Security and Authentication
- Web Load Balancer
- CSS
- HTML/JavaScript
- Application language
- Web Front end
- Back end server
- Data layer
- Hardware selection
- Rack layout
- Datacenter cooling
- Physical security

StackOverflow survey showing Devs who considered themselves FSE grew from 29% in 2013 to 52% in 2019
The Fallacy of the Full Stack Engineer

- Design overall architecture of the web application.
- Maintain quality and ensure responsiveness of applications.
- Collaborate with the rest of the engineering team to design and launch new features.
- Maintain code integrity and organization.
- Experience working with graphic designers and converting designs to visual elements.
- Understanding/implementation of security and data protection.
- High experience with back-end programming languages: PHP, Python, Ruby, Java, .NET, JavaScript.
- Proficient experience using advanced JavaScript libraries and frameworks such as AngularJS, KnockoutJS, BackboneJS, ReactJS, DurandalJS etc.
- Development experience for both mobile and desktop.
- Understanding of server-side languages including such as Jade, EJS, Jinja, etc.
- Experience with cloud message APIs and usage of push notifications.
- Knowledge of code versioning tools such as Git, Mercurial or SVN.

https://www.skillgigs.com/full-stack-developer
Costs from Cognitive Overload

- exhaustion
- cynicism
- burnout: lost energy, enthusiasm, & confidence
- lower quality
- depression
- health problems

Maslach Burnout Inventory (MBI)

https://www.youtube.com/watch?v=gRPBkCW0R5E&feature=youtu.be
https://www.mindgarden.com/117-maslach-burnout-inventory
WIP is a leading indicator

Why Work-in-Progress Matters

- WIP is a leading indicator
- The single most important factor that affects wait time is capacity utilization
Flow Load: The WIP report
If we have data, let’s look at data. If all we have are opinions, let’s go with mine.”

- Jim Barksdale
Flow Efficiency:  
The percentage of time where work is in an active state vs. a wait state.

\[
\text{Flow Efficiency} = \frac{\text{Work}}{\text{Work} + \text{Wait}}\times 100\%
\]

Benefit: Learn how much wait time exists in Value Stream to drive discussion to improve decisions on prioritization, capacity & utilization.
UNKNOWN DEPENDENCIES

Software Delivery Roadmap
“Things take too long” is a universal problem

Disconnects in communication interferes with collaboration & delays delivery

work request
Technology Disruption
The reality of the situation
Tool fights break out due to inability to share knowledge, understand work capacity and improve workflow.
“If you measure anything, measure wait time.”
Exercise: Flow Metrics Discussion

Time: 3 min

Scenario:
Engagement level of your team is low
High utilization
Key people are leaving

Question for the table:
What changes and trends in which flow metrics would you expect to see given the above scenario?
Flow Metrics for Scenario

Things to consider:
• Things take too long – Flow time
• People drowning in work - Flow Load
• No investment in fixing Debt - Flow Distribution

• What about trust? Consider Flow Safety
Considerations
Flow Safety: A measure of trust

Examples:
• On my team, failure causes inquiry and not blame.
• Our leadership is open to hearing bad news.
• In my org, failures are learning opportunities and messengers are not punished.
• People on our team trust one another

@nicolefv  https://www.youtube.com/watch?v=avauW5FAWCw
Considerations:

1. If we improve one metric, what is the impact to other metrics?

2. What signals will you look for to recognize when one metric is optimized good enough and it’s time to prioritize other metrics?

3. Improvement takes time – how to know when it starts?
The 5 Thieves of Time

Unplanned work
Conflicting Priorities
Unknown Dependencies
Neglected work
Too Much WIP

@dominicad
What we measure impacts people because people value what is measured.
TAKEAWAYS & BENEFITS

- Flow metrics are tied to business value
- Flow metrics are based on outcomes
- Flow metrics provide a feedback loop to improve decisions
IT can't be successful without business support and business people can’t support IT if ideas aren't framed in terms they understand.

Involve your business people
5 Flow Metrics - focused on business outcomes

- **Flow Time** – speed
- **Flow Distribution** – work item types
- **Flow Velocity** – throughput
- **Flow Efficiency** – wait time ratio
- **Flow Load** – WIP
How to Get started with Flow Metrics

Start capturing 1 work item type in 1 VS and 1 flow metric

Homework:
“Find 1 business leader & 1 IT leader and take steps toward alignment. It's up to you.”

Ross Clanton
Email: dominica@SendYourSlides.com
Subject: flow
To receive:

• copy of presentation deck
• Flow 101 workshop info
• Value Stream Canvas exercise
• Tasktop tool integration video showing integrations between ServiceNow & Jira
• excerpts of Making Work Visible
• Forrester report on Value Stream Mgmt