How Software Engineering Leaders Can Use Value Stream Metrics to Improve Agile Effectiveness

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By Analysts Bill Swanton

Initiatives: Software Engineering Strategies

As software engineering leaders scale agile development to more teams, they often struggle to help teams optimize their processes. The emerging field of flow analytics provides visibility to continuously improve processes for business leaders, product managers and the teams themselves.

Overview

Key Findings

- Suboptimal processes and performance across teams undermine the software engineering leader’s agile transformation efforts.

- Without consistent metrics on detailed operations, software engineering leaders have no way to guide teams and coaches on best practices. They also have no way to pinpoint the specific areas that each team needs to focus on.

- The same lack of visibility can cause business leaders to question progress reporting from software engineering leaders, undermining trust.

Recommendations

Applications and software engineering leaders trying to improve software development processes should:

- Create a culture of continuous improvement by setting the expectation that everyone must examine their processes and metrics to identify areas for improvement. Keep this exercise disconnected from reward and punishment, so that teams participate without fearing reprisals.

- Provide process visibility and highlight areas that need coaching by implementing common metrics dashboards. The dashboards should feature business analytics based on data from software development and product management tooling.

- Increase trust between business leaders and software engineering by building transparency into the product development process and making high-level progress on delivery more visible.
Analysis

This research has been adapted from “Analyze Value Stream Metrics to Optimize DevOps Delivery.”

Software engineering leaders rolling out agile product delivery at scale need to implement highly automated software development processes across many teams. These development value streams are powered by a variety of DevOps tools and individual team practices, resulting in a lack of process visibility to leaders and the teams themselves. How can everyone gain the visibility to harmonize and improve these processes? The emerging domain of flow analytics collates activity and pipeline data, visualizes development value streams, and provides actionable insights for process improvement.

The benefits of flow analytics accrue at many levels of the organization (see Figure 1). Flow analytics gives:

- Technical teams visibility of the end-to-end processes to identify areas for improvement
- Product managers visibility on progress implementing the product roadmap
- Business stakeholders visibility of overall product/service delivery status

Figure 1: Provide Process Visibility and Highlight Areas That Need Coaching by Implementing Common Metrics Dashboards With Business Analytics

Role-Based Benefits of Flow Analytics

| Business Stakeholders | • Monitor software delivery status against product roadmaps  
|                       | • Track performance and minimize the total cost of ownership  
|                       | • Enable business intelligence with data-driven decision making |
| Product Management    | • Manage product development and support activities  
|                       | • View the progress of each feature and user story in a release  
|                       | • Support informed decision making to maximize product outcomes |
| Technical Professionals| • Simplify process flow using transparency and a single source of truth  
|                     | • Visualize impediments to drive effective improvement activities  
|                     | • Enhance engineering intelligence with accurate analytics |

Source: Gartner 721857_C

Like any metrics, these metrics can be abused. They should be used only to:
Use flow metrics to identify opportunities to improve delivery performance — never to compare performance for the purpose of rewarding or punishing individual teams.

Create a Culture of Continuous Improvement

The key responsibility of the software engineering leaders in this area is to create a culture of continuous improvement. Set the expectation that everyone should be using metrics on their team, product or process to see where they can improve:

- Scrum masters and agile coaches should be using them to identify areas where coaching is required.
- Development teams should examine them during the retrospective to decide what improvements they should target during the next sprint.
- DevOps teams should use them to find and alleviate any constraints in the delivery process that the tool chain automates.
- Software engineering leaders and communities of practice should use them to identify proven practices and processes that can be spread to other teams.

For this culture to be created, leaders need to be very careful that teams don't fear punishment for lower-than-average metrics. The leader's response should always be, "What can we do to help you improve?"

Implement Flow Analytics Systems to Provide Visibility

Table 1 shows some examples of the flow metrics to consider. Much like the metrics in a lean manufacturing process, they measure how smoothly work is flowing through the system and how responsive teams are to changing demand.
Table 1: Example Flow Metrics

<table>
<thead>
<tr>
<th>Technical</th>
<th>Product</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code change size</td>
<td>Lead time</td>
<td>Product cost</td>
</tr>
<tr>
<td>Code delivery speed</td>
<td>Cycle time</td>
<td>Product value</td>
</tr>
<tr>
<td>Code refactoring rate</td>
<td>Throughput</td>
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<td>Code review churn</td>
<td>Work in progress</td>
<td>Product quality</td>
</tr>
<tr>
<td>Code quality</td>
<td>Flow efficiency</td>
<td>Net Promoter Score</td>
</tr>
<tr>
<td>Technical debt</td>
<td>Work profile</td>
<td>Customer satisfaction</td>
</tr>
</tbody>
</table>

Source: Gartner

Manual collection and calculation of the metrics would be costly, inaccurate and slow-moving to the point of uselessness. Vendors are starting to offer systems that integrate with your software development, infrastructure and monitoring tools (version control, work management, test management, etc.) to collect, calculate and present the metrics continuously.

Representative vendors and products are described in Analyze Value Stream Metrics to Optimize DevOps Delivery. They include:

- CloudBees Value Stream Management
- Code Climate Velocity
- ConnectALL Value Stream Insights
- GitLab
- LinearB
- Pluralsight Flow
- Plutora
- Tasktop Viz
Make High-Level Progress on Delivery More Visible to Increase Trust

A common issue in agile transformation is the need to increase trust between the engineering teams and the business leaders. Business leaders need to trust that teams are delivering timely value. Achieve this trust by showing leaders the progress made against the product roadmaps and the value of what teams have delivered (see How to Use Product Roadmaps for Funding and Governance of Agile Product Delivery Teams).

Flow analytics can automate this type of reporting, creating a dashboard for business stakeholders to see the flow of delivery of the products. This transparency helps build the levels of trust required between the business, product management and software engineering for the agile transformation to be successful. Automating this reporting helps leaders and teams move away from presentation-based periodic review meetings (which can devolve into agile success theater) to real-time visibility of the process, as described in Evolve From the Quarterly Business Review to Continuous Agile Governance.

Recommended by the Authors

- Analyze Value Stream Metrics to Optimize DevOps Delivery
- Evolve From the Quarterly Business Review to Continuous Agile Governance
- How to Use Product Roadmaps for Funding and Governance of Agile Product Delivery Teams
- Use the Right Metrics in the Right Way for Enterprise Agile Delivery
- Market Guide for DevOps Value Stream Delivery Platforms
- Case Study: Accelerated Product Team Delivery Through Strategic Dependency Management (Ford)
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