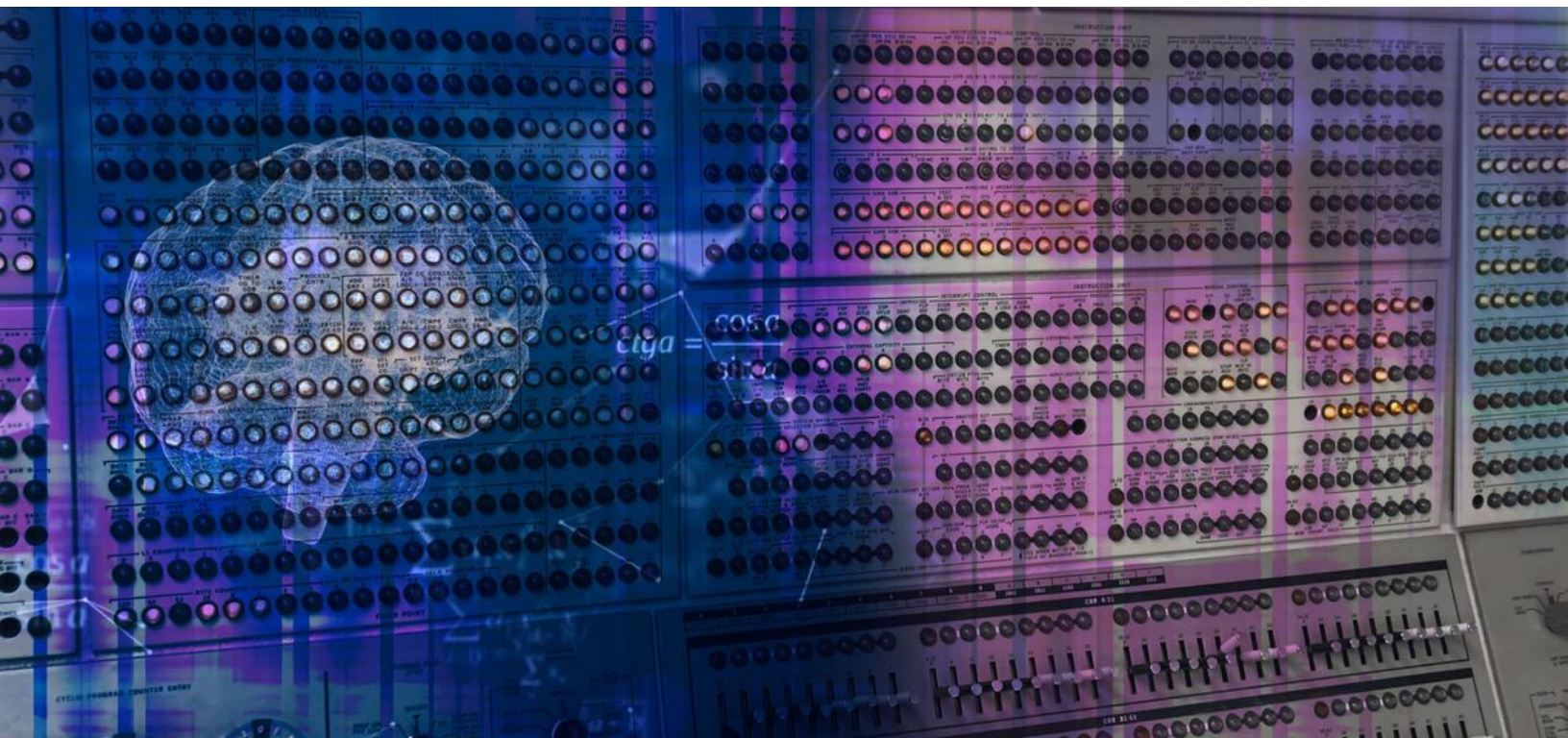# Mature Your Software Development Process with Value Stream Management

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Just as with factory production lines, software development processes can suffer from bottlenecks, inefficiencies, poor quality, and wasted time and effort.

To address these concerns, Value Stream Management (VSM) provides visibility into critical indicators of speed and quality for any software development pipeline, empowering the software team to remove waste and overhead by automating the flow of information across the software value stream.

VSM is especially important for organizations that are looking to mature their software development practices. As they move from waterfall to Agile to DevOps and CI/CD, VSM provides the visibility and control necessary to maintain a focus on business value even as the business and software environments become increasingly dynamic.

What is Value Stream Management?

Think of a factory as a gigantic black box.

Raw materials and parts go in one end, and finished widgets come out the other. Inside, people are busily working on turning the former into the latter.

For the factory to be profitable, the cost of the inputs plus the labor must be less than the selling price of the widgets.

However, look more closely, and this equation becomes a bit more complicated. The widgets must have sufficient quality, or customers will get angry and return them. The amount of time it takes to manufacture the widgets must be comparable with the competition, and in any case, fast enough to respond to changes in customer demand.

Crack open the box, and you'll see the materials go from one station to the next, where at each station people undertake a task that adds value to the product in progress. In fact, the notion of a value stream arises from this notion that manufacturing a finished good consists of a sequence of steps, each of which adds value.

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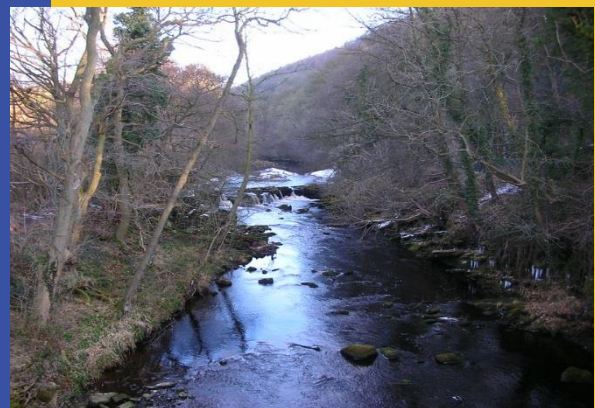
The philosophy of Lean manufacturing centers on managing such value streams by managing the value at each step. Streamline the manufacturing process to remove wasted time and wasted materials while maintaining quality throughout.

Now, instead of manufacturing widgets, what if you were manufacturing *software*?

In many ways, the value stream of software resembles that of the widgets: we want to manage the value at each step, removing waste by eliminating bottlenecks while maintaining the quality of the finished product.

In other ways, manufacturing software is quite different than manufacturing widgets, as the ingredients, as well as the finished product, are entirely human-generated. Software is nothing but a particular arrangement of zeroes and ones – and humans must do the arranging.

In fact, the components of any software product are simply other bits and pieces of software. Zeroes and ones all the way down.

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In fact, one of the most important goals of VSM is to improve the flow of value as the development team progresses through its tasks.

Measurement of such improvements is also an important characteristic of VSM. By measuring the flow of value streams instead of software features and functions, teams are better able to focus on activities that increase value to the organization and most importantly, to its customers.

Such measurement enables organizations to align their software development efforts – and ideally, the entire IT organization – to business outcomes. The focus of such measurement should be on critical indicators of speed and quality in the software delivery value stream, much as speed and quality are essential to the profitability of a factory.

Perhaps the most familiar characteristic of the Lean philosophy is the reduction of waste. In a factory such waste refers to wasted time and wasted materials, while in the production of software, the focus is entirely on time.

There are many causes of such waste in software value streams, from approval steps that stop development to multiple teams competing for resources to rework that results from poor quality. VSM targets all such areas of waste with the goal of improving the rapid flow of high-quality software.

Today, every enterprise depends upon software, and excelling at VSM becomes an important differentiator that leads to greater competitiveness, profitability, and growth. In addition, VSM provides greater visibility into the software development process, improving traceability and the overall governance across the software value stream.

Understanding Where You Are

One of the primary reasons the factory metaphor for VSM is particularly useful is because the Lean movement that gave birth to VSM actually came out of Toyota as far back as the 1930s. In many ways, however, using a factory manufacturing process is actually a dreadful way to think about software development.

Ironically, the waterfall methodology for software development from the twentieth century resembles a factory assembly line far better than modern approaches. In waterfall, development assumes that the team fully understands the requirements before writing a line of code. And then each step in the process is discrete, with clear transitions from one step to the next.

Henry Ford would feel quite at home with the waterfall methodology. After all, his innovation of the assembly line began with a clear design for the Model T, and every step on the line was discrete and clearly followed the one before. At the end, finished automobiles rolled out of the factory, ready for eager consumers.

Perhaps your organization still follows waterfall explicitly – a surprising number of enterprises still do – but even if it doesn't, there's still a good chance that a waterfall mentality still permeates the software team's approach.

After all, how can you start one activity until the previous one completes? How can you build software without a clear understanding of its requirements? How can you test software before you've written it? The fact that these questions still indicate ongoing confusion suggests that waterfall thinking still predominates.

Decades of blood, sweat, and tears have proven, however, that waterfall rarely delivers a good result. For many organizations, one of the most important benefits of VSM is actually breaking free of this unhelpful waterfall mentality. The first step: visibility into your current value streams.

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A VSM solution like ConnectALL's can capture indicators of speed and quality across your current software development pipeline, enabling you to visualize and analyze your current value streams. As a result, you're able to quickly identify bottlenecks and other issues while evaluating the constraints that lead to such bottlenecks.

Most importantly, VSM can help you identify the current flow of work through your software organization. Without such visibility, there's no way to know if people are wasting time or working on the wrong tasks.

In other words, allowing VSM to shine the light on existing software development processes can identify the myths that are misleading your team – in particular, the myths of waterfall. Only by shedding such myths and working from the true situation – backed by real data – can you begin to make improvements.

The first improvement to make: removing bottlenecks in the flow of work. Such bottlenecks can take many forms.

Perhaps one person or team is waiting for another person or team to complete an activity before the fist team can start (or finish) theirs. In other situations, two or more teams both require the same resource (which could be a person, a tool, or anything else), and thus they end up fighting for resources.

A third, common cause of bottlenecks: a constraint that stops the flow of work. Constraints can be policies or rules (either official or unofficial) that require a cessation of activities.

For example, many organizations require that a change board meet and approve any changes to requirements. In other situations, a compliance offer or security manager must check and sign off on work before it moves to production.

While it's possible to resolve many bottlenecks by reallocating resources, constraints like these are often nonnegotiable, and thus require more sophisticated approaches for mitigating the slowdowns they cause. VSM can be an essential enabler of this mitigation.

Once your VSM solution has shined its light on all the dark corners of your existing software pipeline, you have the information you need to create a plan of attack. Typically, resolving issues with your value streams requires that people change the way they work, which can be difficult. The best approach, therefore, is to break up the challenge into smaller, manageable steps. VSM can be essential for this task as well.

Using VSM to Plot Your Course

We have known about the shortcomings of the waterfall methodology for decades now. After all, we invented shift-left testing and iterative approaches like Scrum and other Agile methodologies in order to address such shortcomings. In other words, waterfall is old news.

Agile, however, is no panacea. The Agile Manifesto that gave impetus to the Agile movement is nearly two decades old now, and in the context of modern software best practice has its own issues.

Nevertheless, for many enterprises and government agencies, Agile has become dogma. Massive inertia prevents any iconoclasts from throwing well-deserved stones at the glass house that is Agile – for better or worse.

One of the reasons Agile has failed to deliver on its promise: too many organizations approach Agile with a waterfall mentality. In fact, the combination of Agile and waterfall even has a name: *Scrumfall*, an unholy combination of iterative development and testing with waterfall requirements gathering and deployment into production.

If your organization is stuck with one of the various flavors of Agile (including Scrumfall), take heart. VSM is the ideal tool for both identifying the current issues with your software value streams and recommending how to improve them.

And if you're in the camp that believes that Agile is still the best approach for your organization? VSM can give you the rude awakening your organization so desperately requires.

DevOps is not a methodology. It is more a cultural and organizational transformation that recognizes that a collaborative approach to software development that leverages automation will deliver better results in a shorter amount of time than either waterfall or Agile.

If not Agile, then what? The long arm of software best practice has been swinging inexorably toward DevOps. However, DevOps is not a methodology. It is more a cultural and organizational transformation that recognizes that a collaborative approach to

software development that leverages automation will deliver better results in a shorter amount of time than either waterfall or Agile.

Where DevOps centers on the people, continuous integration and continuous deployment (CI/CD) focus more on the process. In many ways, CI/CD inherits the mantle of software development best practice from Agile, which received it in turn from waterfall two decades ago.

DevOps and CI/CD recognize that in the intertwined modern business and software landscapes, change is constant, expected, and in many ways desirable. In fact, we can think of the trend from waterfall to Agile to DevOps and CI/CD as being one of dealing increasingly well with dynamic business and technology environments.

Not only does a VSM solution like ConnectALL's provide visibility into current value streams and helps you identify their bottlenecks, it also gives you the insight you need to make changes to all aspects of your software development approach, including people (DevOps), process (CI/CD), and technology (modern DevOps tooling as well as cloud-native technologies like Kubernetes).

This dynamic nature even applies to DevOps and CI/CD, as current software best practice is itself dynamic. New technology paradigms like cloud-native computing are once again upending traditional thinking about how best to build and release software for people to use.

How, then, should you navigate the turbulent waters of DevOps and CI/CD, especially if you're a waterfall or Agile shop struggling to overcome the inertia of obsolete software development processes?

VSM, of course. Not only does a VSM solution like ConnectALL's provide visibility into current value streams and helps you identify their bottlenecks, it also gives you the insight you need to make changes to all aspects of your software development approach, including people (DevOps), process (CI/CD), and technology (modern DevOps tooling as well as cloud-native technologies like Kubernetes).

Best of all, VSM connects all this complexity to the value you are providing to your customers – even as everything changes.

It is no longer possible to manually adjust how you build software in hopes that such changes will lead to improvements. You need factual information in real-time that connects all the activities on the software development lifecycle to the business value you are delivering to your customers right now. VSM is the answer.

The Intellyx take

Optimizing the value you provide to customers in order to maximize profitability, increase market share, and trounce your competition is clearly a top priority for any for-profit organization. Public sector organizations have the equivalent: optimizing the value to their constituencies in order to achieve their mission priority.

Given the inherently dynamic nature of the business and technology worlds, however, optimization will always be a moving target. True, VSM connects the dots between day-to-day activities and such optimized value, but remember: the journey is as important as the destination.

Finally, be sure to remember that among people, process, and technology, people are the most important. We can argue all we like about software methodologies (process) or tools (technology), but in the end, business value is a human metric. Process and technology will always be a means to this end.

About the Author: Jason Bloomberg

Jason Bloomberg is a leading IT industry analyst, author, keynote speaker, and globally recognized expert on multiple disruptive trends in enterprise technology and digital transformation.

He is founder and president of Digital Transformation analyst firm Intellyx. He is ranked #5 on Thinkers360's Top 50 Global Thought Leaders and Influencers on Cloud Computing for 2020, among the top low-code analysts on the Influencer50 Low-Code50 Study for 2019, #5 on Onalytica's list of top Digital Transformation influencers for 2018, and #15 on Jax's list of top DevOps influencers for 2017.

 Mr. Bloomberg is the author or coauthor of five books, including *Low-Code for Dummies*, published in October 2019.

About ConnectALL

ConnectALL helps companies achieve value stream management and create business value by bringing software innovation to market faster. The company's integration platform, which was awarded Best in Show in the Value Stream Management category of the 2019 SD Times 100 and ranked a "High Performer" in the G2 Spring and Summer 2020 Reports. ConnectALL unifies applications, tools, people and processes, connecting dozens of software delivery tools and facilitating powerful cross-team collaboration. In short, it empowers the true value drivers of software development — humans — to achieve project goals. Paired with its Universal Adapter, ConnectALL can unite an unlimited number of tools for seamless collaboration, bi-directional information capture and exchange, automated event triggering, and much more. For more information, visit https://www.connectall.com.