Kanban University

KANBAN AT VANGUARD
An Experience Report

Contents

Vanguard Fast Facts

To be in the *vanguard* is to be in the forefront. Vanguard began operations in 1975. Today, it manages about 5.2 trillion dollars in global assets. Our core purpose was stated by our founder, John Bogle: "To take a stand for all investors, to treat them fairly, and to give them the best chance for investment success." To fulfill our core purpose, we believe that character counts.

- Integrity
- Focus
- Stewardship
- Our pledge to adapt, evolve, and continuously improve in pursuit of excellence

"To take a stand for all investors, to treat them fairly, and to give them the best chance for investment success."

—John Bogle, Vanguard founder

Vanguard remains alone in placing clients' interests in the driver's seat. Our corporate structure still is unique among mutual fund providers: shareholders are the ultimate owners, receiving net profits in the form of lower costs. Our average expense ratio is a mere one-tenth of one percent.

Vanguard's Lean Operating Model

To promote a Lean culture at Vanguard, and to enable the delivery of what we call "Business Value at Startup Speed," we developed a Lean Operating Model to illustrate our journey (Figure 1). One result has been behavioral change—from the project team level all the way up to the business management level—to align more closely with fast value delivery.

Another result is that the Scrum framework has been associated with Vanguard's Agile transformation by default. The silver lining to this cloud is that the Kanban Method is the disruptor playing to its strength as the alternative approach to agility.

From April 2018 through March 2019, maturity levels were studied to quantify the effects of twelve years of Agile "transformation" and five years of DevOps. A target population of approximately 240 Agile teams was sampled. The sample set grew to approximately 10 percent of the total population, with good distribution across the enterprise. In addition, an independent sampling dimension involved observing over 700 individual practitioners in training classes, coaching sessions, and on the job.

The key result was that, of the twenty-four teams in the sample set, all of which started with Scrum, 40 percent "voted with their feet" and switched or were planning to switch to Kanban. A related result was that the majority of the Kanban teams who recovered from "Scrum stall" exhibited flow metrics that outperformed all but one of the very best Scrum teams!

Vanguard is discovering that Kanban's alignment with the DevOps "Three Ways" is superior to Scrum's. One indicator is worth noting: in the past year, teams are asking for Kanban coaching in four out of five new requests. The reasons are obvious:

1. For "Fast Flow," Kanban has a richer, simpler, and more effective set of metrics and forecasting tools.
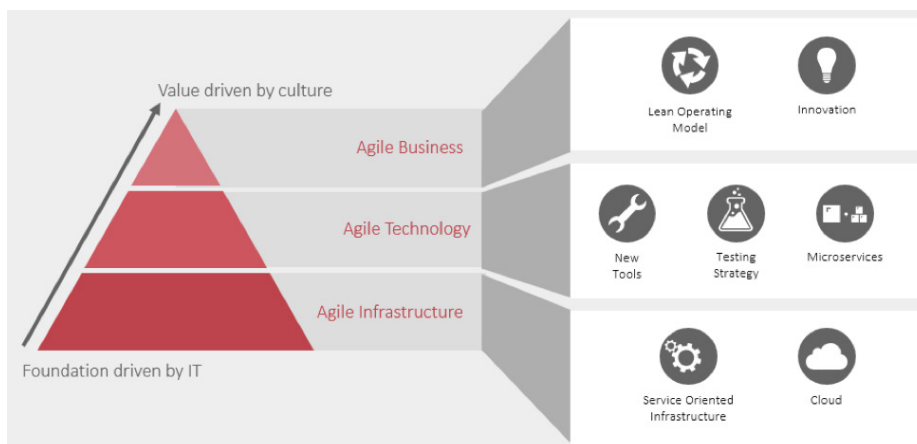2. For "Fast Feedback," Kanban's visual orientation encourages end-to-end systems thinking. So,

Figure 1 Vanguard's Lean Operating Model

the indispensable upstream flow receives a lot of attention.

3. For "Fast Learning," Vanguard knows it must continue to evolve its nimble digital infrastructure. Our CIO, John Marcante, puts it this way: "We continue to learn more each day. My advice to everyone is to make sure you don't get too far ahead of yourself. Start at the foundation—do you have nimble enough infrastructure and software development practices to enable an Agile business?"

Essentially, this is the evolutionary approach of the Kanban Method. Vanguard tested its Lean Operating Model for achieving business value at startup speed along four dimensions:

1. If self-organizing teams are essential to enterprise agility, then what Lean and Agile method selection trends are observed after twelve years of "transformation," including five recent years of focusing on Lean principles?

2. Assuming that empiricism is central to DevOps fast flow, fast feedback, and fast learning, how are empirical measures used to promote continuous improvement in delivering value at a reasonable cost?

3. If the scientific method is applied, are repeatable experiments confirming expected results?

4. What critical success factors appear to be common at Vanguard despite varying performance conditions?

Empirical Results

At Vanguard, we tested the effects of training, kanban board flight levels, time-boxed iterations, and new ways of thinking and working. Under controlled test conditions, we found:

- that training classes and workshops delivered to full teams for Kanban practices and principles were inconclusive when tested against subsequent empirical performance for lead time and average delivery rate of work items;

- that hierarchical workflow boards stacked in "flight levels" or managed through time-boxed iterations were less effective for driving favorable outcomes for decision making than classes of service on a single, larger board;

- and that the so-called new ways of thinking and working first pioneered by Microsoft Holland to foster radical decentralization were sterile without a Lean or Agile

method to actually deliver value early and often.

What really works at Vanguard are the following:

- Deep-immersion coaching over a firm ninety-day commitment window during which the teams and their management people can engage deeply using practical systems thinking techniques.

- Good, old-fashioned systems analysis with a hearty focus on system context diagramming and workflow as well as service class visualization.

- Enterprise Services Planning feedback opportunities, as shown in Figure 2,[1] with an immediate commitment to a monthly operations review.

- A robust commitment to upstream filtering to eliminate unevenness as close to the source as possible. This pays enormous dividends in the form of fast flow downstream under WiP limits. This is the "secret sauce" of success!
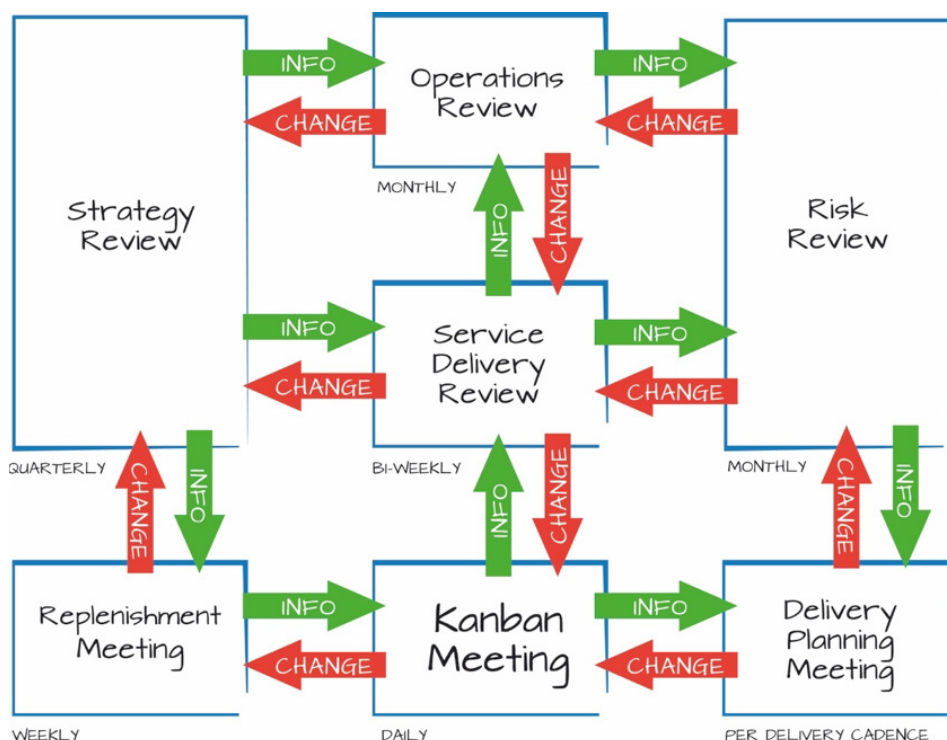

Figure 2 A set of cadences showing feedback loops

1. This figure was originally presented in *Essential Kanban Condensed* (David J Anderson and Andy Carmichael, Lean Kanban University Press, 2016; used by permission).

Recovering from Scrum Stall

In aeronautics, *stall* is defined as a sudden reduction in the lift generated by an aerofoil when the critical angle of attack is reached or exceeded (see Figure 3). The critical angle of attack usually is 15 degrees. At the stall, the airflow across the upper wing ceases to flow smoothly. When this happens, upper surface airflow becomes turbulent, thus greatly reducing lift and increasing drag. In short, the plane can't fly.

Stall is a metaphor for unevenness and over-burdening in the flow of knowledge work. The symptoms of reduced lift and increased drag are seen in scatter plot high population means and wide standard deviations among samples, as well as in cumulative flow diagrams depicting sluggish average delivery rates with or without evidence of bottlenecks. If I were to use one word to describe Agile teams with stall symptoms, it would be "mediocre" (Figures 4 and 5).

Scrum Stall Causes

Scrum stall has three causes:

1. Myopia. This is a team-only orientation characterized by wearing blinders and sprinting heads-down, with limited awareness of upstream or downstream factors affecting end-to-end flow.

2. Product Owner Bottleneck. Too much power is required of this Scrum role. Scrum's framework grew out of new product development practices, and the need for this kind of creative power can lead, in far too many cases, either to a single point of team failure or bottlenecked flow due to incompetence. Where is "encouraging acts of leadership at every level" in Scrum?

3. Hortator. This is the Latin name for a Roman galley cadence keeper using a drum beat. Hortator means *encourager* and *exhorter*. In Latin, it is a masculine noun. Scrum sprints can be like "ramming speed" in the movie *Ben Hur*. Instead of a WiP-limited cadence evolving naturally from the team, as in Kanban, the Scrum cadence often is imposed and, therefore, generates unevenness and over-burdening. Naturally, this leads to waste.

Scrum Stall Effects

The effects from the three Scrum stall causes are many, but three stand out at Vanguard.

1. Customers are trained toward low expectations. Delighting a customer with low expectations is an oxymoron.

2. Team mediocrity becomes ingrained. During the age of sail warships, "dumb show" was how penny-pinching captains trained their gun crews. They went through the motions of firing their cannons without actually firing them. Sadly,
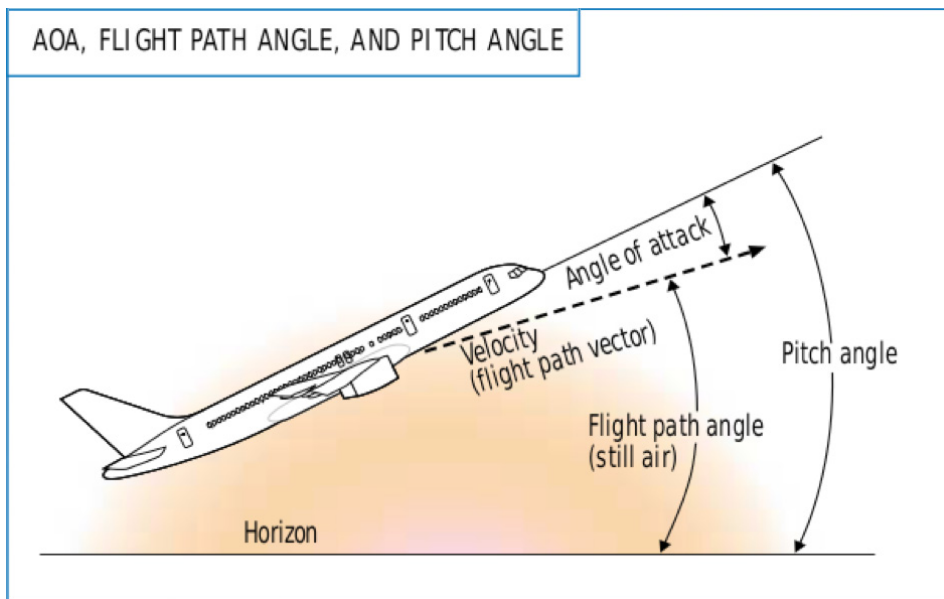

Figure 3 Stall (Reference: https://www.skybrary.aero/index.php/Stall)

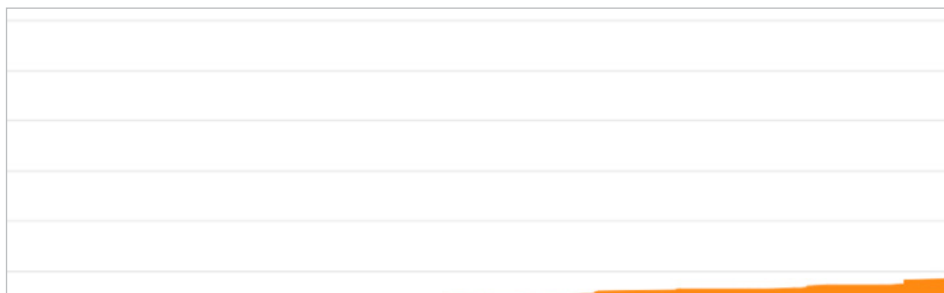**Figure 4** Mediocre lead time

Figure 5 Mediocre cumulative flow

merely practicing the gunnery process often proved fatally inadequate in combat. The metaphor carries over into knowledge work: if teams never "fire" they have no real focus on delivering early and often.

3. Mediocre system lead times and average rates of delivery play into the hands of traditional management, especially when risk is high. Perversely, mediocre Scrum teams experiencing stall justify the need for traditional project management tools, techniques, and processes.

Team P: Evolution through Systems Thinking

Team P was comprised of two teams of approximately twenty people working together, with two managers and two team leaders. They were responsible for a financial systems database platform. Their value stream was a common combination of project-based work, recurring maintenance, break-fix demand, platform enhancements, and ongoing service and support work.

In their pre-Kanban state, they struggled for a year to apply Scrum using the JIRA tool. Average delivery lead time ranged from thirty-eight to fifty-seven days, with a low work item volume "elevated" to production. The team had great difficulty identifying their real customers and, by extension, they were confused about the kinds of service for which they were responsible. As a result, they were dissatisfied with their quick-fix manual process flow. This team flew into a Scrum stall condition because of uneven flow (*mura*), which led to over-burdening (*muri*), which naturally generated waste (*muda*) in the form of technical debt, rework, and backward "flow."

Vanguard has had great success with good, old-fashioned systems analysis. The system context diagram is effective at casting upstream flow problems into sharp relief, while at the same time demanding clearer depictions of exactly who the customers are. Said another

way, the system context diagram helps eliminate variability as close to the source as possible. It also helps downstream flow by setting the stage for work item affinity analysis per customer and workflow visualization.

At Vanguard, we combine system context diagramming, system workflow visualizing, and class of service grouping *immediately* and *all together*. We emphasize simplicity and effectiveness all the time. For stalled Scrum teams switching to Kanban, the payoff has been spectacular.

For Team P, the following visualization took place through classical systems analysis, as shown in Figures 6 and 7:

- System context diagram
- System workflow
- Affinity grouping, leading to classes of service

The objective was to better identify customers and their services downstream from the team and to better control the inbound workflow upstream from the team, thus attacking variability as close to the source as possible.
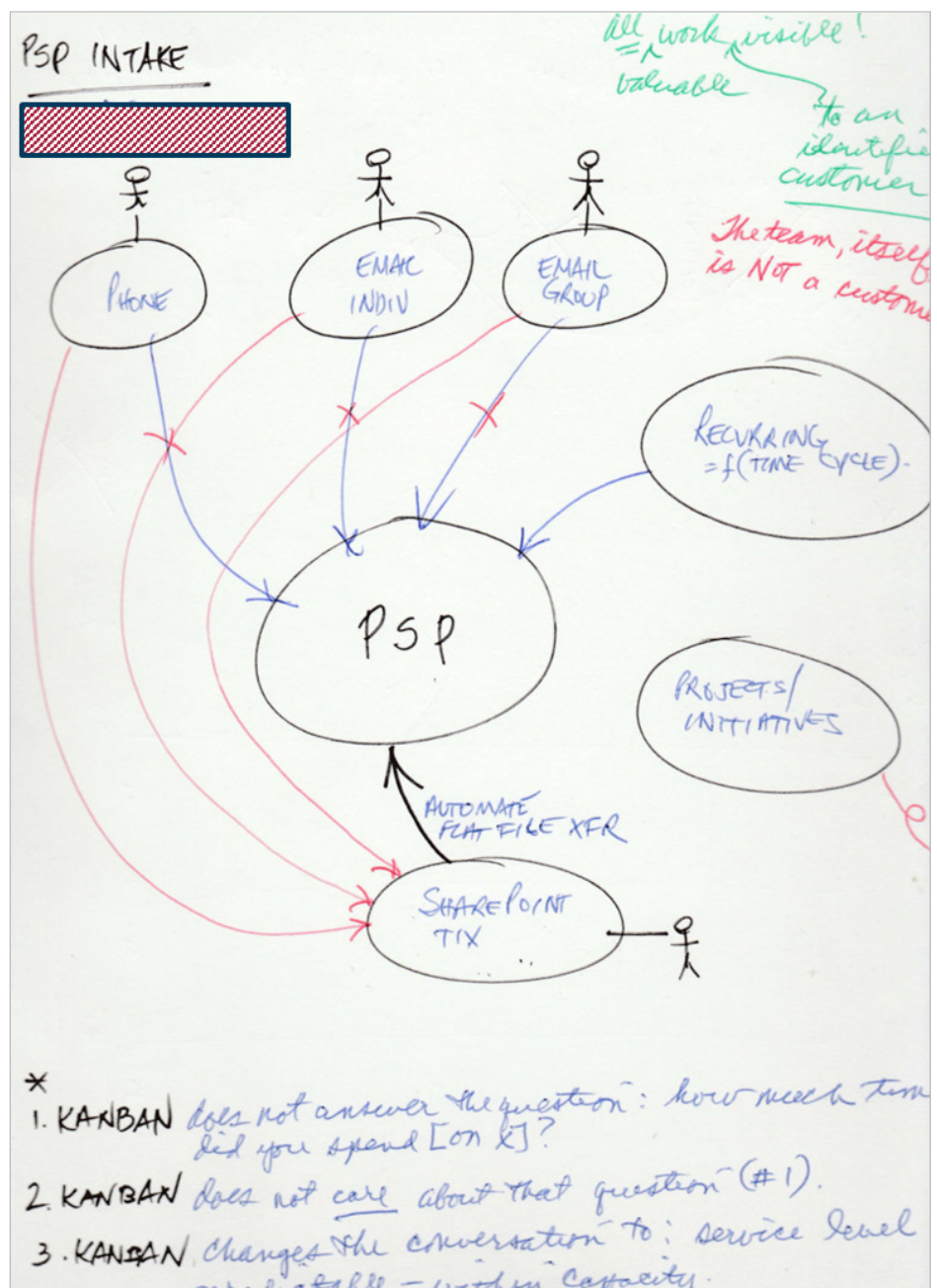

Figure 6   Facsimile of the system context diagram generated by team P

Figure 7 is what simplicity and effectiveness look like in practice for a system workflow visualization and classes of service modeling.

Figure 8 is what simplicity and effectiveness look like in practice for defining enterprise services planning cadences. This was done in one working session. Note how existing meetings are repurposed.

Team P had poor upstream flow control because of manual processes and work "push" that had evolved willy-nilly over years, as depicted in Figure 9.

After committing to evolutionary change using the Kanban Method, Team P improved upstream flow control, again using system context diagramming, as depicted in Figure 10. An increase in automation in support of capacity management was an additional benefit.

Scrum stall disappeared in the first ninety days after Team P switched to Kanban. They accelerated their evolution toward fast flow, fast feedback, and fast learning by committing to Kanban's Enterprise Services Planning (ESP) approach:

- Operations review with mid-level management and all teams (new monthly meeting)
- Replenishment meeting including mid-level management (repurposed existing meeting)
- Kanban standup meeting with the team itself, with enhanced collaboration among parallel teams (repurposed, refined existing meeting)
- Strategy review with the financial system governance board (repurposed existing meeting)
- Delivery planning with production release continuous integration/continuous delivery (CI/CD) pipeline technical management (repurposed existing meeting)
- Risk reviews with the project management office (PMO)

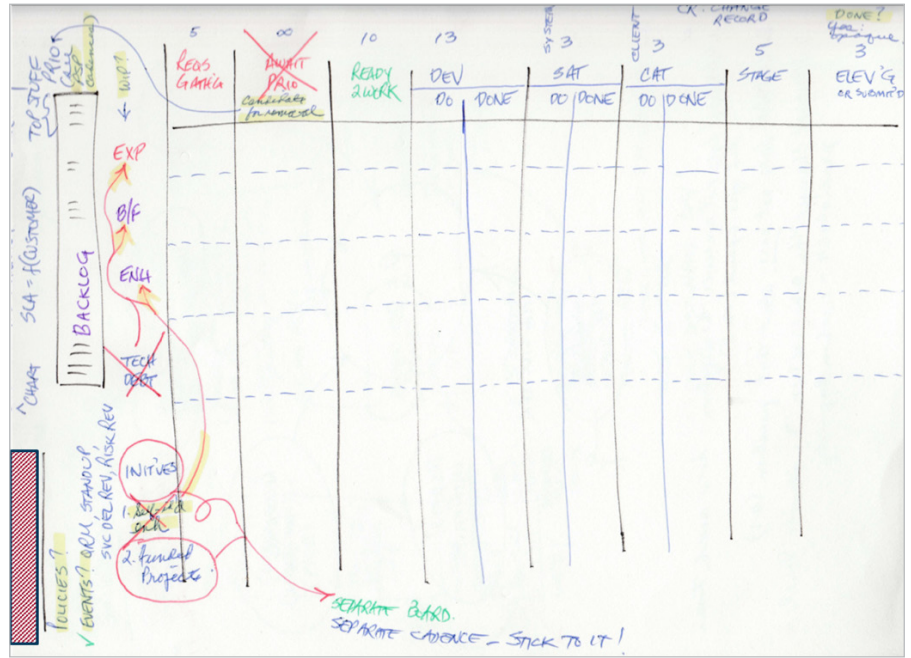The operations review and replenishment meetings were the most

Figure 7 Facsimile of affinity grouping leading to class of service modeling

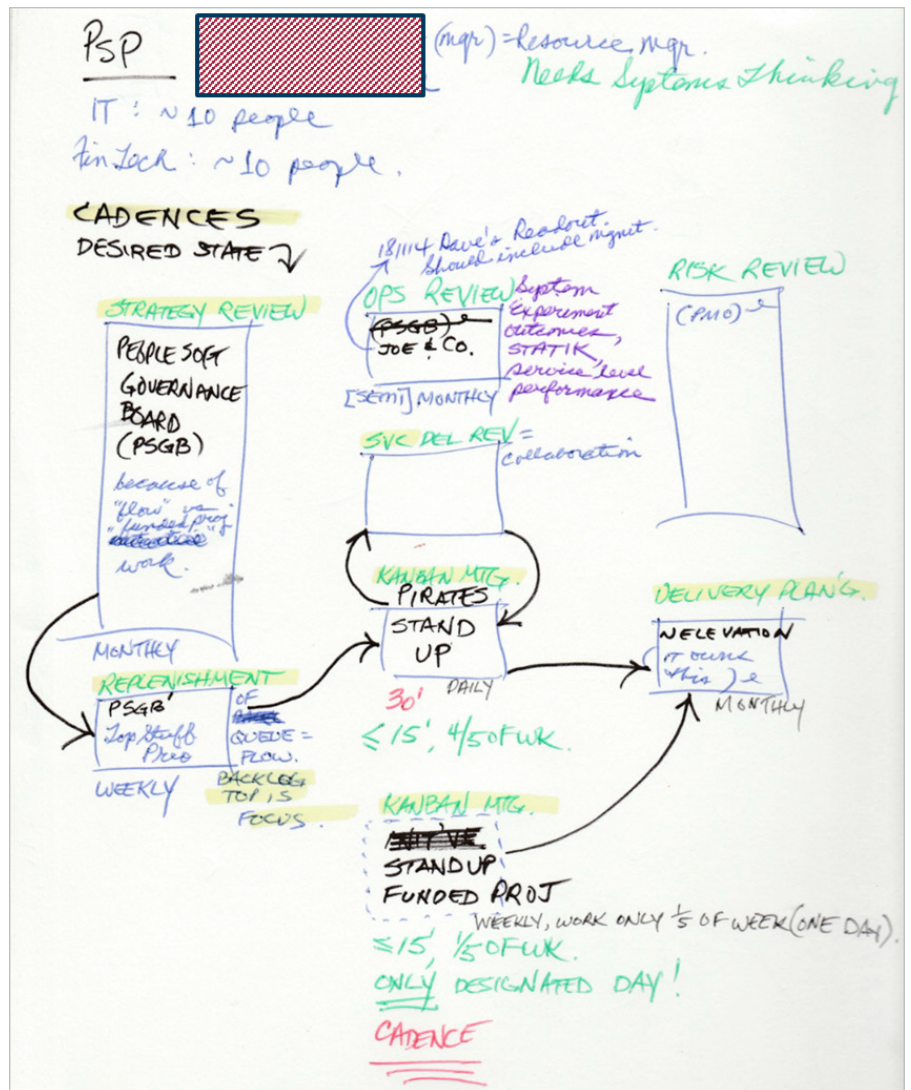significant contributors to improved speed and volume of work flow. The

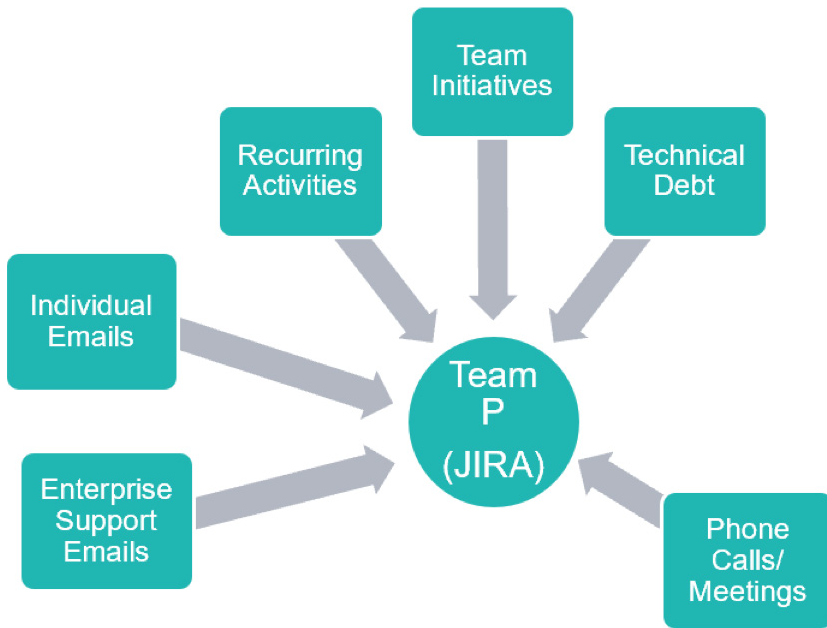**Figure 8** Facsimile of ESP cadences
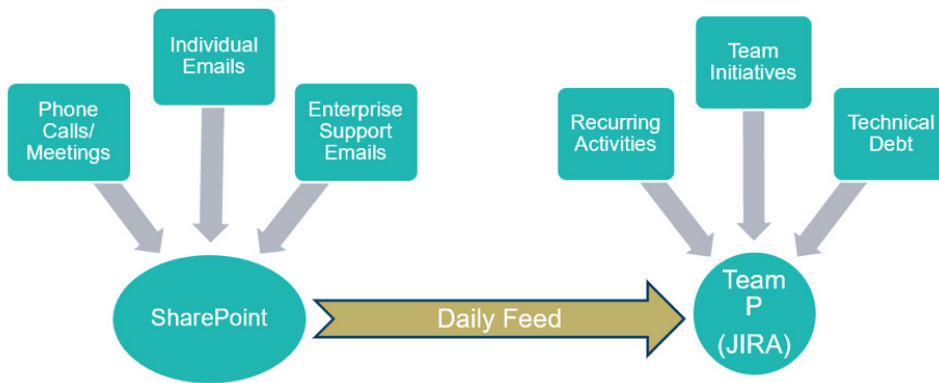
Figure 9   Upstream system for the Scrum stall state

Figure 11   Classes of service

Figure 10   Upstream system for the Kanban flow state

standup, strategy review, delivery planning, and risk meetings evolved from existing meetings.

The only ESP cadence not tried was the service delivery review. However, its lack has had no apparent adverse effect.

Systems thinking focused everyone's attention on workflow visualization and end-to-end optimization. Immediate work type affinity grouping led to strong classes of service which, in turn, led to stronger policies, reduced costs of delay, and a far deeper understanding of exactly who the customer is.

At Vanguard, we have evolved Kanban practices at the team level by doing these things simultaneously.

Team P's new classes of service (Figure 11) grew out of system context diagramming, upstream optimization, and a fresh look at exactly who their customers were. Using the JIRA platform, they automated their class of service metrics and simultaneously invested in evolving policies for managing value delivery this way. The cost of delay concept was new to them but, with practice, they improved their decision making for service class prioritization and WiP limits, resulting in better work item flow.

The team's emphasis on upstream filtering and classifying work items enabled them to better "right size" their

> *The operations review and replenishment meetings were the most significant contributors to improved speed and volume of work flow.*

work items and to define an effective commit point. Explicit policy definition

continued to improve, resulting in faster downstream flow (Figure 12).

System lead time improved by 78 percent in approximately ninety days! Note the eradication of upper control limit violations, as shown in Figure 13. Standard deviation still was too high a percentage of sample mean in relative terms. In absolute terms, however, Team P became much more predictable, with a bias toward "better than expected." Team P could now commit to service levels.

All system variables were kept constant except for improvements in workflow modeling—an end-to-end WiP limit and classes of service with new, explicit pull policies as well as upstream work filters—all driving better decision making.

Team P repeated their improved system lead time performance three months in a row, thus achieving statistical significance (Figure 14).

In this experiment, the dramatic improvement in system lead time was a function of upstream work item filtering and class of service definitions. In other words, Team P directly attacked variability as close to the source as possible, and then reinforced improved flow evenness starting upstream by implementing policies to reduce total WiP downstream. Vanguard has experienced over and over the beneficial effects of doing both workflow modeling and service class definition early and together.

Figure 15 shows the cumulative flow diagram (CFD) five months into the Kanban evolution. Bottlenecks are obvious, but the elevation rate has improved over the Scrum stall condition. Team P applied Eliyahu Goldratt's Theory of Constraints directly by doing bottleneck root cause analysis. Vanguard's Kanban teams have taken another page out of Goldratt's book: they construct simple, practical solutions.

The root cause of the bottlenecks was traced to poor labor capacity distribution.

Figure 12 Realistic work flow

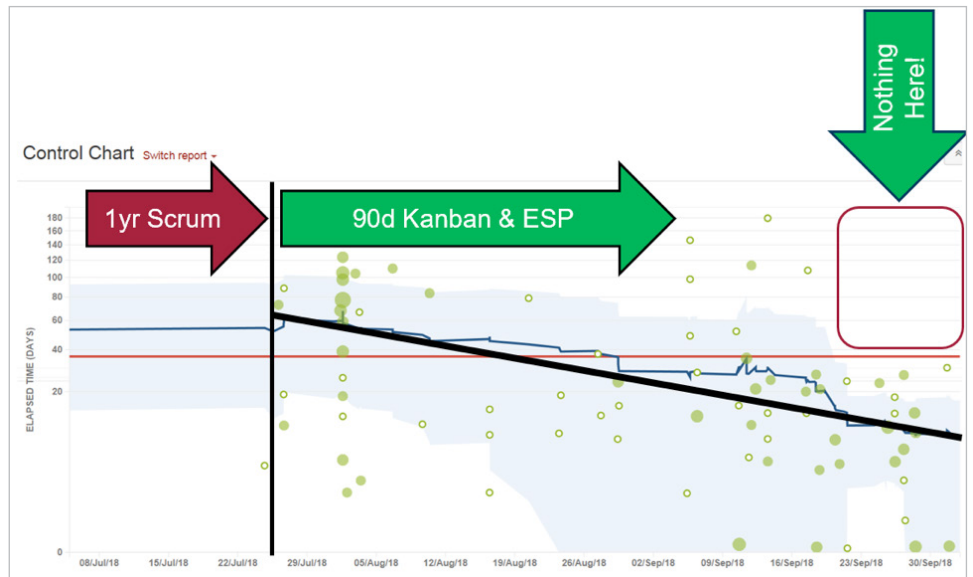The other good Kanban behaviors   only went so far when bottlenecks were
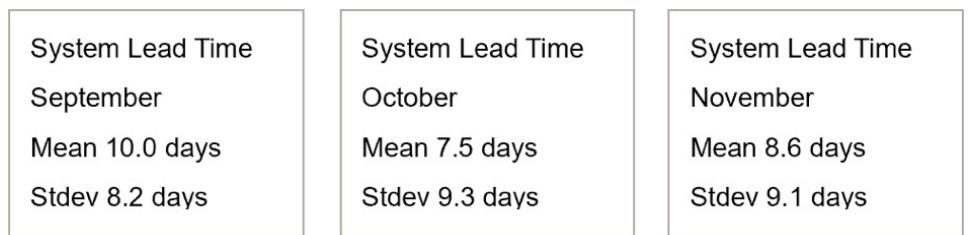

Figure 13 Flow metrics

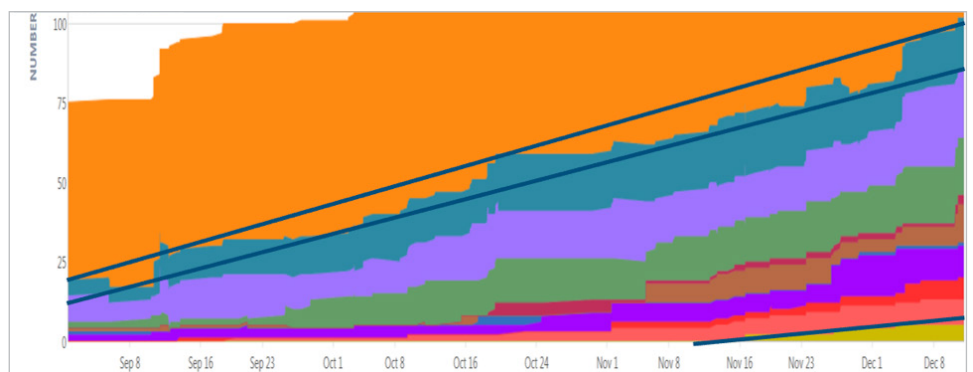**Figure 14** Flow metrics repeated month after month

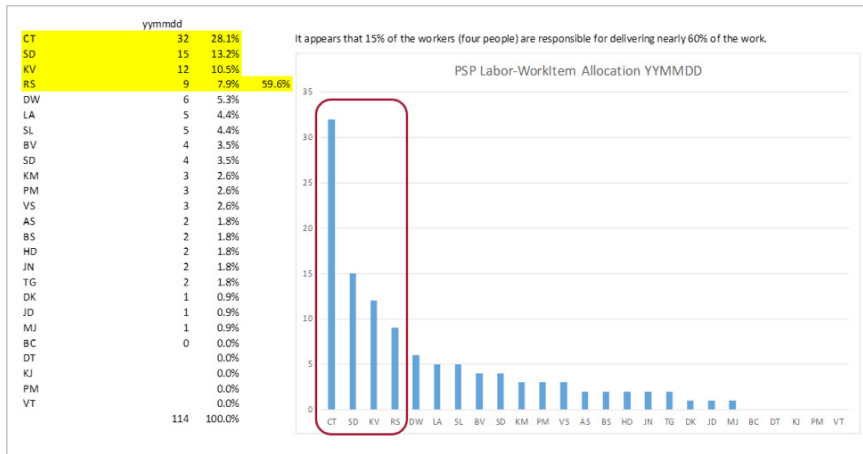**Figure 15** Flow metrics CFD at five months

Figure 16 Bottleneck root cause analysis

rooted in poor capacity distribution across the labor pool. In other words, the tension introduced by WiP limits failed to achieve creative slack for Team P. The lack of slack was traced to four critical resources handling 60 percent of the work, as depicted in Figure 16. The monthly operations review kept this important issue right out front for both the team and its managers.

Team P has remained a maturity level 2 team for managing flow and for making policies explicit (Figure 17).

Team Q, presented next, learned from Team P and jumped from maturity level 1 to maturity level 3 in just 90 days.

PRINCIPLES

🟢 Start with what you do now.

🟢 Agree to pursue evolutionary change.

🟢 Encourage acts of leadership at every level.

🟡 Focus on the customer.

🟡 Manage the work and let people self-organize.

🟢 Evolve policies to improve outcomes.

PRACTICES

🟢 Visualize.

🔴 Limit WiP.

🟡 Manage flow.

🟡 Make policies explicit.

🟢 Implement feedback loops.

🟢 Improve and evolve.

Figure 17 Team P Kanban Method feedback loop

Avoiding Scrum Stall

Team Q: Exploring the Critical Success Factors

Team Q has approximately twenty people working together, with two managers and two team leaders. They are responsible for revenue and rebate systems and services within Finance. Their value stream is a common combination of external vendors, project-based work, recurring maintenance, break-fix demand, platform enhancements, and ongoing service and support work.

This team switched to Kanban from three-week-sprint Scrum for two reasons:

1. Uneven flow of work due to the gravitational pull of a large project
2. Too many flow boards to enable management oversight

Team Q avoided Scrum stall because they sensed they were headed into it. They truly are a full-support product team. All product work plus production support flows through this team. Originally, they felt that Scrum was beneficial for the large project work, and the majority of the team was committed to it. However, once the large project was complete, the cost of uneven flow and multi-board overhead was pointless. Using sprints to limit WiP no longer had value. The team needed to reorganize the way

The power of an end-to-end physical board with policies for workflow states, classes of service, and upstream filtering has been enormous and positive.

they worked to avoid the stall their team leaders could feel was about to happen. The leading symptom of their impending stall was frustration with visualizing the end-to-end flow. A related symptom was hearing the refrain, "Sprints are pointless now."

The power of an end-to-end physical board with policies for workflow states, classes of service, and upstream filtering has been enormous and positive. Figure 18 shows the initial attempt at a physical board correlated to a JIRA virtual board.

Team Q integrates external vendors with internal teams. The emphasis on upstream filtering and flow control is clearly shown in Figure 19.

Classes of service (Figure 20) proved to be a major step forward. No expedites have occurred for months!

Stop starting, start finishing! The team walks the board from right to left; this was a new technique for them, focusing first on the items closest to done. The personal envelopes (Fig-

Figure 18 Visualizing the alternative path to Agility

Figure 19 The power of a physical board

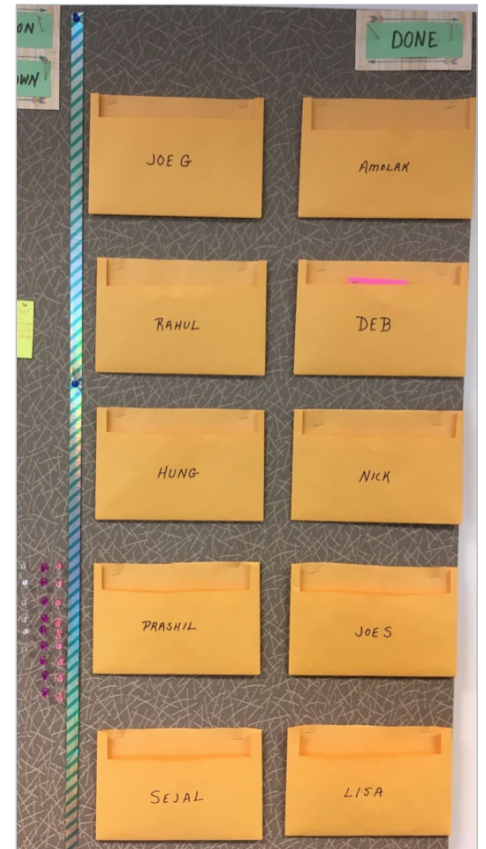**Figure 20** Classes of service

Figure 21 Stop starting, start finishing!

ure 21), into which go the cards for completed work, are the evidence of success; they provide a gratifying personal feedback loop fully transparent to the entire team as well as to anyone looking at the physical board. JIRA takes care of the automated metrics, production "elevation" processing, and workflow completion metrics by service class. It is the synchronized physical board that has contributed most to this team's higher Kanban maturity levels, though.

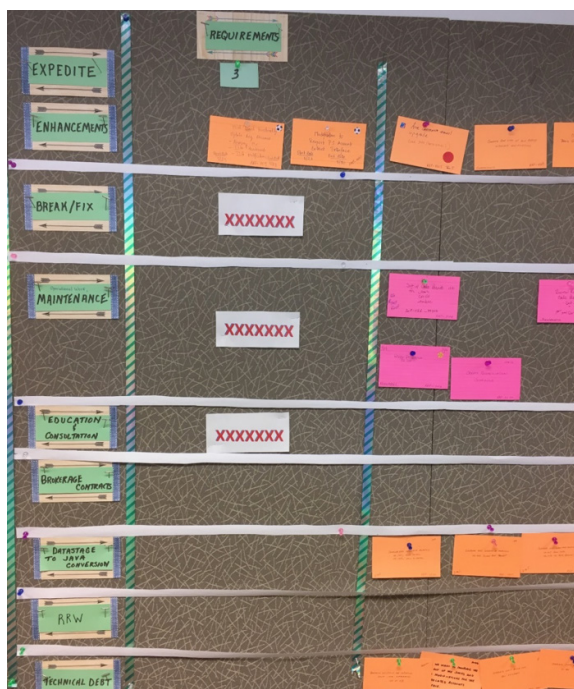The brilliant insight of Team Q, however, was the upstream filter board shown in Figure 22; its threshold is less than one hour of work effort. "X" signifies that the work actually was done in one hour or less. Circled items proved to exceed this threshold and were substantial enough to be promoted to the Kanban queue.

Upstream filtering is a critical success factor that has been proved consistently across different teams in
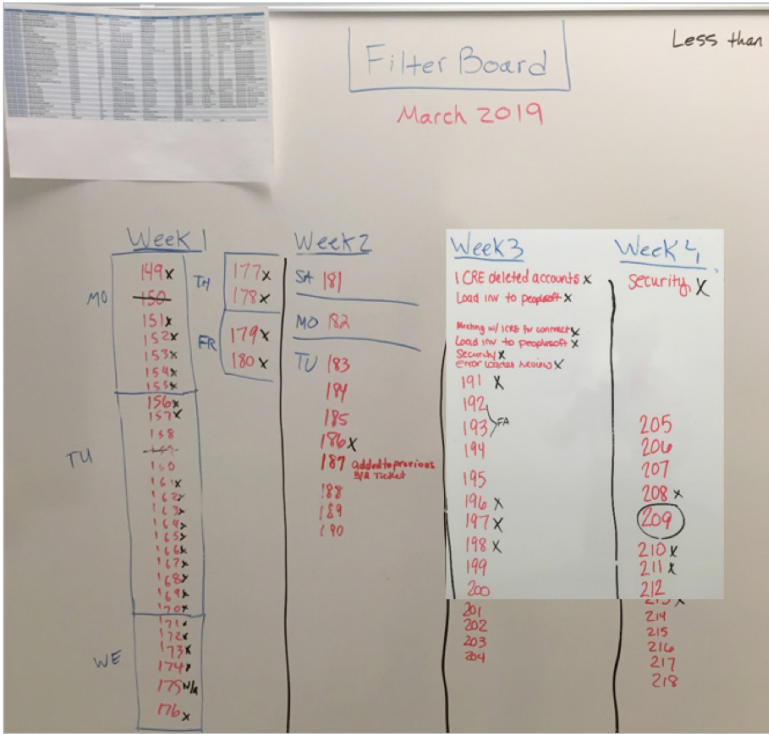
Figure 22 Upstream filter board

different areas and at different matu-   rity levels at Vanguard. The simplest
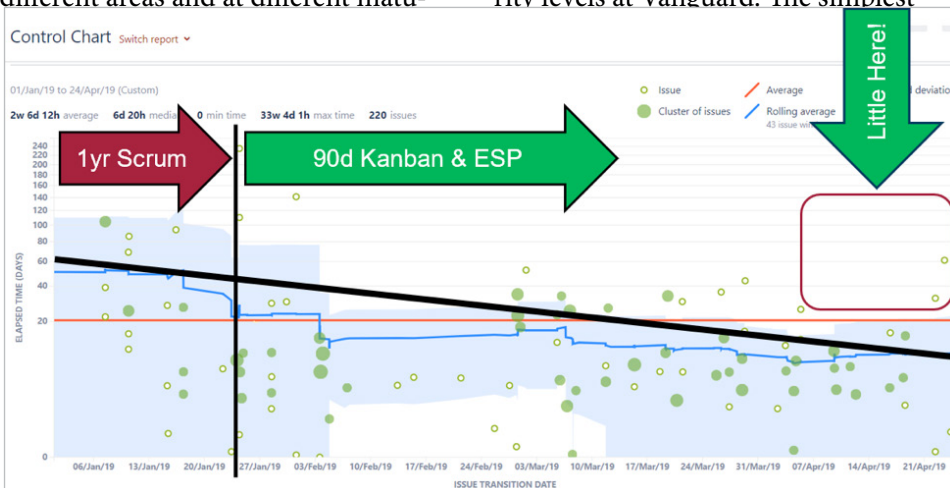

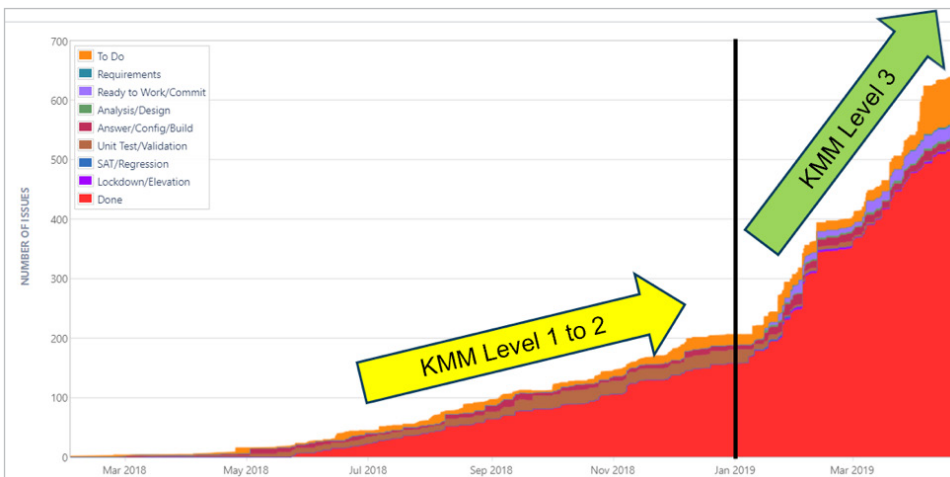**Figure 23** Flow metrics—success with STATIK

Figure 24 Team Q's flow metrics—spectacular acceleration!

filter boards are the best because they encourage adoption and use and, therefore, are more effective than more complicated "flight level" schemes.

Vanguard has proved that scatter plots do not always improve in lockstep with cumulative flow diagrams. In the case of Team Q, system lead time improvement lagged by about a month.

System lead time dropped from an average of sixty-five days to fifteen days, a 77 percent improvement. Note in Figure 23 that upper control limit violations have been reduced to nearly zero. Team Q repeated Team P's experimental results to within one percentage point for system lead time improvement and with nearly the same reduction of upper limit lead time violations to near zero.

Team Q's flow improvement was spectacular after they hit an inflection point in January 2019, as shown in Figure 24. We concluded that:

- merging multiple separate boards into one large board promoted simplicity and effectiveness and it enabled . . .
- a robust focus on upstream work classification and filtering, which . . .
- motivated the team to focus on WiP limits. Simultaneously, . . .
- a set of service classes renewed the focus on the customer, vendors, and production release frequency.

In retrospect, we discovered that team Q's inflection point occurred when they achieved maturity level 3. You really never know when this will happen, but if the right environment is nurtured and the right behaviors are cultivated, it happens. Vanguard's six critical success factors were used *all together* and it took about ninety days to observe the effects. Figure 24 illustrates an average delivery rate increase of 325 percent, and this really got management's attention. Indeed, this is being written up in a company newsletter as an example of success.

The following factors were focused on early and all together:

- Big, visible physical Kanban board
- Upstream filtering
- Focus on bottlenecks

- Kanban Maturity Model (KMM)

The Kanban Maturity Model was (and still is) used as a "map back to actual practice." The KMM is not used as a "map forward to next steps."

Never Experiencing Scrum Stall

Team C: Attacking Variability at Its Source

Team C is in the compliance operations area in Vanguard's Legal unit. It is comprised of a core of approximately five people but expands its team size on demand per each compliance project. This team never experienced Scrum stall. It has always used Kanban, but did not always use class of service "swim lanes." Team C forged a close working relationship with the business PMO, within which a dedicated team of upstream analysts focus diligently on work item affinity grouping, prioritization, and filtering. Team C, therefore, benefits tremendously from upstream filtering to eliminate unevenness as close to the source as possible.

Team C exhibits low maturity for managing classes of service, however. Despite this, their cumulative flow is "steady as she goes"; see Figure 25. Our Vanguard experiment's conclusion is that extraordinary attention to, and dedicated labor resources assigned to, upstream work filtering has successfully attacked variability at its source. This is another example of the secret success sauce.

Limited WiP is implemented implicitly through strong pull policies. Explicit WiP limits are not emphasized. Consequently, team C exhibits low maturity with respect to explicit WiP limits, as shown in Figure 26. However, the team has evolved its own unique yet implicit WiP limitation through strong pull policies. For system lead time, we would expect to see unevenness, and we do. "Pulsing" can be seen every four to six weeks, which corresponds roughly to this team's production "elevation" schedule.

A further contributing factor may be

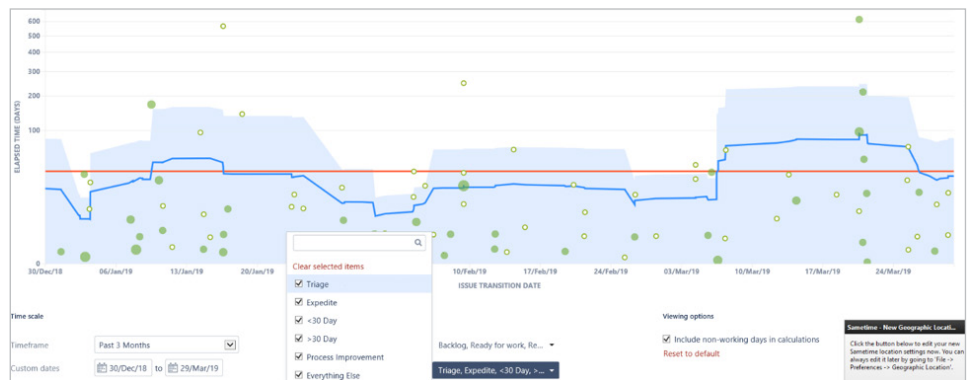**Figure 25**   Cumulative flow—steady as she goes

Figure 26   Flow metrics

that operations review meetings no longer are held, although they were at first.

Team V: How NOT to Shift from Scrum to Kanban

Team V has one product owner, one scrum master, and eleven development team members. For a Scrum team, this is quite large. Team V claims they did not experience Scrum stall but switched to Kanban because they spent too much time "checking the boxes" in the Scrum framework, which they viewed as overhead. Their Scrum velocity metrics revealed little to them. However, applying continuous flow metrics such as system lead

time and cumulative flow told a far different story in which stall was the antagonist.

From the Scrum master's point of view, the primary driver for switching from Scrum to Kanban was to raise the bar for sense-and-respond experiments directly with real customers. Cycle times needed to get much shorter. Without realizing it, this Scrum master had hit the nail on the head.

Team V works in a Scrum "lab" area within Vanguard. Their metrics (Figures 27 and 28) indicate that they are an example of how *not* to switch from Scrum to Kanban.

A mindset of a two-week sprint still can be observed in the system lead time metrics, with high unpredictability within the ten-working-day time frame. This team's low maturity workflow state definition still is rooted in Scrum and not in realistic workflow states.

Team V also carried over their old Scrum sprint states, but instead of using them as their workflow basis, they have rendered them as Kanban service class swim lanes:

- Design
- Analytics
- Test
- Development

Fortunately, the population mean of just under five days is good. Nevertheless, Team V is stuck in maturity level 1 practices with a low interest in evolving. Myopia and the product owner bottleneck are deeply ingrained in how they work.

Team V advertised to management a 20 to 30 percent improvement in cumulative flow. Yet, "flares," indicating a rate of new work arrival exceeding the team's rate of delivery, are evident, as are bottlenecks (Figure 28).

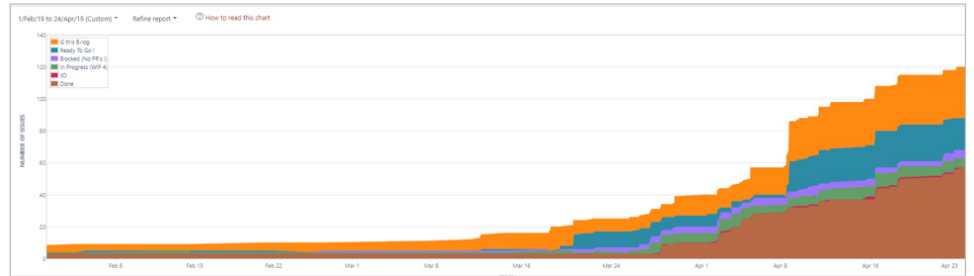**Figure 27** Lead time mediocrity

Figure 28 Cumulative flow mediocrity

Since work variability is *not* attacked as close to the source as possible, bottlenecks downstream are to be expected.

They have improved their flow over their Scrum performance, yes, but that flow has once again leveled off. Myopia and the product owner bottleneck are deeply ingrained in how they work.

There are two bright spots:

1. A new focus on backlog refinement started a few months ago. Now, they strive for doing it two to three times per week. Before, the team struggled to do any backlog refinement because they were spending too much time "checking the boxes" on the rest of the Scrum framework.
2. They have evolved a risk review with a ninety-day look-ahead window, which is very ESP-like.

STATIK through No-Stall Scrum

Team J: A Scrum Team with Kanban Practices

Team J was created from scratch ten weeks before the end of the year-long Lean Operating Model experiments. They are a new product development team of just six people, each of whom is cross-functional to a very high degree. Initially, they kept their options open as to which Lean-Agile method to adopt. This team pivoted at three weeks and delivered a new product with a ninety-million-dollar risk exposure mitigation rating in just four weeks. Talk about delivering value early and often! They went on to deliver Van-

guard's first cloud-based one-stop shop for direct operating expense analysis with a business value expressed as analyst work effort reduction in the tens of thousands of hours per year.

This is a Scrum team with a difference. They use an upstream "to do" board as a separate class of service for work items not related to the product vision. Team J invests heavily in upstream filtering to attack variability as close to the source as possible. They keep their Scrum board as simple as possible, without workflow, per se. Instead, the focus is on limiting work in progress (WiP) using a one-week

iteration. They do not use story points to estimate anything. Instead, they have a ferocious commitment to constant product backlog refinement. This is supported by explicit pull policies and work item quality criteria to "right size" each work item entering the sprint backlog. Team J is ruthless about not wasting time; they have said "No!" to management, to peers requesting just an hour of time, and to recurring demands for reports. Their justification for this Lean behavior is a massive commitment to customer engagement. Value-driven work is fully transparent, both on physical boards and in JIRA,

and non-value-adding work simply doesn't make the cut.

Using Kanban-style fast feedback metrics, Team J avoided Scrum story point sizing and velocity metrics altogether. Instead, they have pursued continuous-flow Scrum using one-week sprints. Figure 29 shows Team J's system lead time performance at just seven weeks of existence. Note that value is accepted, on average, every two days.

Team J has an aggressive focus on how work enters their system upstream. They have a superb product vision that drives a ruthless commitment to discarding low-value ideas very early. They implement a simple "To Do" board to filter out short-duration work not of direct, tangible value to their product vision. They engage in continuous backlog refinement, usually two to three times per week.

As you can see from the beautiful cumulative flow diagram in Figure 30, team J is approaching one-piece flow.

Team J stands out in Vanguard's experiments because they are fully committed to evolutionary change through the Three Ways of fast flow, fast feedback, and fast learning. They are egoless. They have a deeply embedded Lean-Ag-
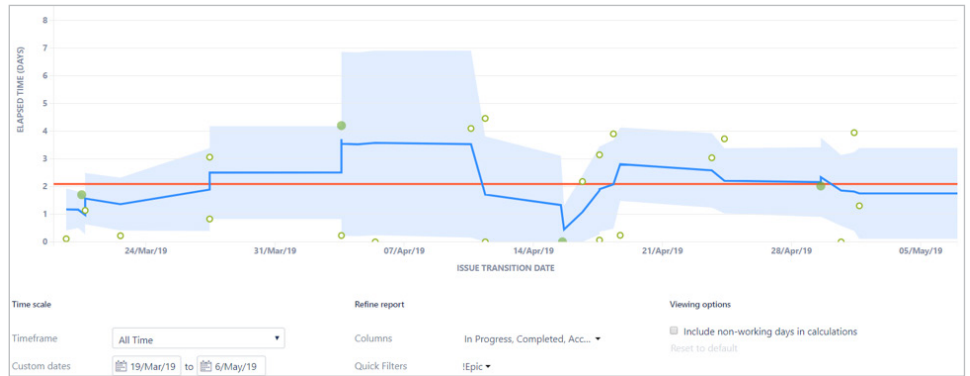

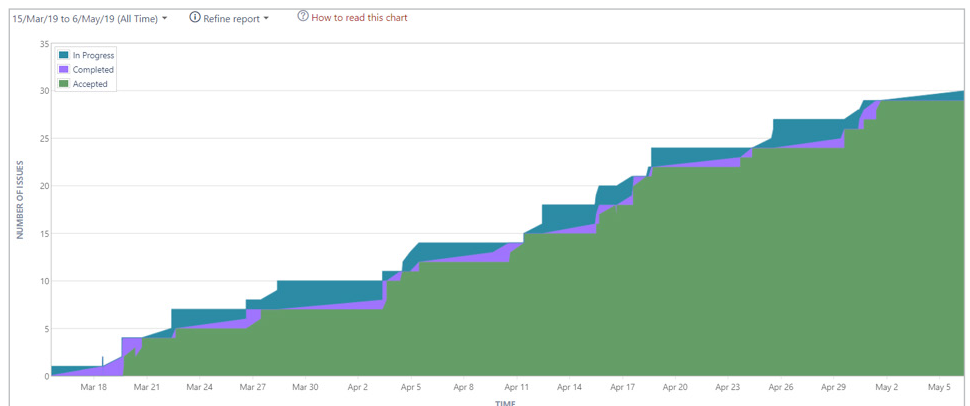Figure 29   Team J's flow metrics—Scrum using Kanban-style system lead time

Figure 30   Team J's flow metrics—Scrum using Kanban-style cumulative flow diagramming

ile coach who also is a hands-on coder. The coach has infused their work habits with Kanban's STATIK (systems thinking approach to introducing Kanban), which is laying the foundation for them to abandon the Scrum framework relatively soon so they can switch to continuous flow work habits and ESP-style cadences.

ESP's Positive Impact on Kanban Maturity Levels

Vanguard applies Enterprise Services Planning (ESP) in a unique way. We use it to support the critical success factors that drive the results we have observed through our year-long experiments using the scientific method. Vanguard has demonstrated that repurposing existing meetings to fit ESP is the path of least resistance to evolving Lean maturity.

The operations review makes all the difference. It is a huge step forward in transparency, collaboration, fast feedback and fast learning, and continuous improvement. Vanguard's experi-

ence indicates that the KMM has this out of sequence in terms of maturity levels. We believe David Anderson's original take on the value of the operations review is more correct. The following quote is from the Blue Book:

> The operations review also shows the staff what managers do and how management can add value in their lives. It also helps to train the workforce to think like managers, and to understand when to make interventions and when to stand back and leave the team to self-organize and resolve its own issues. Operations

review helps to develop respect between the individual knowledge workers and their managers and between different layers of management. Growing respect builds trust, encourages collaboration, and develops the social capital of the organization."[2]

Vanguard has learned that the best results come from investing heavily upstream to control work item flow into the system backlog and attacking

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2. *Kanban: Successful Evolutionary Change for Your Technology Business* by David J Anderson, Blue Hole Press, 2010, p. 163.

variability as close as possible to the source. This is the secret success sauce!

We have learned that physical boards invigorate daily Kanban standup meetings. They also promote unprecedented levels of transparency within the team itself, and they attract high levels of attention from outside the team.

The service delivery review is less important. Vanguard's experiments never established a need for it.

Vanguard Examples through the KMM Lens

At Vanguard, we focus on managing flow and making policies explicit, and we integrate this with our experiments for promoting adoption of the DevOps three ways. We use the Kanban Maturity Model[3] to support this focus.

Manage Flow (MF)

The goal of managing flow is to achieve fast, smooth, and predictable creation and delivery of customer value, minimizing risk and cost of delay. For Vanguard's Lean Operating Model, we see complete alignment between this and the DevOps Three Ways. We have discovered through our experiments over the past year that the Kanban Method provides more of what we need and want.

MF3.8 is particularly relevant: Actively close upstream requests that meet the abandonment criteria—or use upstream filters to prevent clogging the Kanban flow system with

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3. *Kanban Maturity Model* by David J Anderson and Teodora Bozheva, Lean Kanban University Press, 2018; this is the source of the KMM policies referenced in this section.

trivial, easy-to-complete, very short cycle work.

In an April 28, 2019 note from David Anderson in the Kanban Coaching Professional (KCP) community, he said:

> The way to get meaningful, accurate metrics is to make people use them—engage them in the discussion and the improvements. If Kanban Meetings . . . and Operations Reviews are about improvements and system level discussions and not just about heroics to ensure something is delivered on time, then you quickly find that team members want accurate data. Inaccurate metrics come from the fact that other parts of the Kanban Method . . . are missing. If people think metrics are just for managers then there is no incentive for them to help make them accurate.

At Vanguard, we do our best to make sure the incentive is there, as simply and as effectively as possible.

Make Policies Explicit (XP)

Through Vanguard's Lean Operating Model experiments, we have observed a high degree of successful mapping to the

following maturity level 3 practices for making policies explicit:

XP 3.2 Explicitly define request acceptance criteria.

XP 3.5 Define basic classes of service based on qualitative cost of delay.

XP 3.6 Establish a commitment point.

XP 3.7 Explicitly define pull criteria.

XP 3.8 Establish a delivery point and a delivery buffer.

XP 3.9 Establish customer expectations for each work item or class of work items.

XP 3.10 Explicitly define fitness-for-purpose and manage it based on metrics.

At Vanguard, we strive for the following:

XP 4.2 Establish service level agreements (SLAs) on dependent services.

Making policies explicit is all about having a clear orientation to deliver value early and often. At Vanguard, this is fully aligned with our Lean Operating Model.

Conclusions

From May 2018 through April 2019, Vanguard tested its Lean Operating Model under scientifically rigorous controls along four dimensions:

1. Lean and Agile method selection trends
2. Empirical measures used to promote continuous improvement in delivering value at a reasonable cost
3. Repeatable experiments
4. Common critical success factors

Method Selection Trends

Of the roughly twenty-four teams in the sample set in a population of 240 teams,

all of which were started with Vanguard's default Scrum method, 40 percent "voted with their feet" and switched or were planning to switch to Kanban. A related result was even more interesting: nearly all of the Kanban teams that recovered from Scrum stall exhibited flow metrics that outperformed all but one of the very best Scrum teams.

Empirical Measures for Value

At the team level, system lead time and cumulative flow improved dramatically for the post-Scrum Kanban teams that embraced these fast feedback loops.

At the enterprise level, the four DevOps outcome measures are expected to improve as the Kanban Method is adopted in more areas of Vanguard. We have no evidence that this is happening—yet. The evidence we *do* have suggests large standard deviations for these metrics, which are measured month to month. This suggests endemic unpredictability, but again, no empirical evidence yet has been collected and analyzed.

Scientific Method

The scientific method has been applied, and repeatable experiments have been validated at the team level as well as across teams and business areas.

These four logical performance perspectives provided the framework:

1. Teams that recovered from Scrum stall
2. Teams that avoided Scrum stall
3. Teams that never experienced Scrum stall
4. Scrum teams that are successful because they adopt the STATIK approach along with the Scrum framework

Critical Success Factors

Finally, the fourth dimension's experimental results say it all:

- System context diagramming, which leads to . . .
- upstream filtering to eliminate unevenness as close to the source as possible, drives . . .
- an aggressive focus on frequently and continuously refining the backlog; and this fosters . . .
- good behavior patterns and better ways of thinking about affinity grouping of work into service classes, giving rise to . . .
- explicit policy definition, especially for visualizing a commit point in a robust visual workflow and applying downstream WiP limits for smooth, fast flow, which results in . . .
- prudent deferral of commitment to the last responsible moment, thus preserving options to pivot either in pursuit of emerging value or to cut out waste.

And over all of this is Vanguard's increasing adoption of the thing that sets Kanban apart from all other methods —encouraging acts of leadership at every level. Vanguard's culture allows this concept to flourish in more places than most other companies of comparable size.

Promoting Enterprise Evolutionary Change

At Vanguard, our Lean and Agile teams experience the same resistance to change that others experience in large organizations controlled through traditional management models. These models are characterized by incre-

> *. . . the evidence is growing that Scrum stall is a threat to our Lean Operating Model*

mental thinking, sclerotic budgeting processes, centralized decision making, petty operating rules, and controllers who demand answers to the wrong questions.

These models are *not* based on trust, yet they serve their purpose because they are a rational means for maintaining effective corporate governance. The "gravitational pull" of these models is enormous. Your planetary body may be more dense than the planet Vanguard, but the essentials of the metaphor are the same.

My final thoughts use a rocket launch metaphor for Vanguard's approach to the Kanban Method. The rocket needs sufficient thrust to accelerate to escape velocity for low or-

bit; think of low orbit as realizing the benefits of our Lean Operating Model. After a year-long chemistry experiment, Vanguard's propellant has turned out to be a mixture of encouraging acts of leadership at every level and the six critical success factors. We mix these all together to generate thrust. Our experiments over the past year have proved to our satisfaction that using these propellants one after the other does *not* generate sufficient thrust.

For Vanguard, behavior at Kanban Maturity Level 0 describes a ballistic trajectory. So do levels 1 and 2; see Figure 31. What we have learned at Vanguard is that our six critical success factors mixed all together, all at once, generate the thrust we need to achieve orbit. It just so happens that KMM Level 3 practices map to what we do through our "all at once" behavior. This is how we achieve our Lean Operating Model low orbit.

Vanguard's Lean Operating Model originally presumed that the Scrum method would be the critical success factor. After twelve years of Agile "transformation" and five recent years of DevOps activity, the evidence is growing that Scrum stall is a threat to our Lean Operating Model.

The Kanban Method maps more effectively to our desired outcomes for agility, lower costs, higher quality, and greater customer satisfaction. This is our corporate mission, and our Crewmates are more and more inspired by the success of our Kanban teams.

I have heard Vanguard Crewmates come up to Kanban teams and ask, "So, how do you actually deliver so much value so well?" I think there's no greater compliment, especially when I hear managers say it.
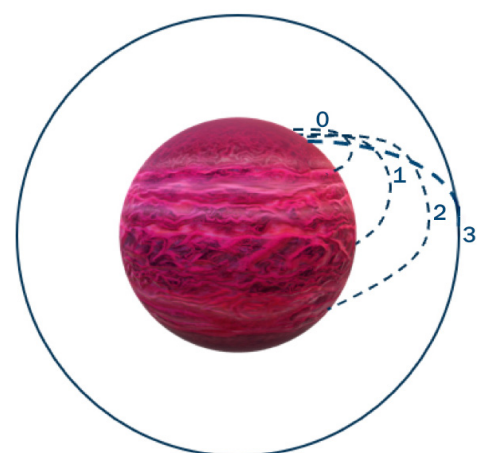

Figure 31   Rocket launch metaphor—achieving KMM orbit

Author

Dave Hughes is a practitioner of the Kanban Method. He has been a speaker at conferences for Lean Kanban, AgilePhilly, Agile & Beyond, the Project Management Institute, the Network for Women with Careers in Technology, the AICPA, the Software Engineering Institute, MITRE Corporation, and the Naval Undersea Warfare Center. Dave has taught professional development and technical courses to over 8,000 people world-wide. He has nearly four decades of business, engineering, and professional experience, including 22 years using Lean and Agile techniques. He originated Accepted Value Costing (AVC), the evolutionary approach to Lean-Agile costing and decision making.

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Kanban University works to assure the highest quality coaching and certified training in Kanban for knowledge work and service work worldwide. Our Accredited Kanban Trainers™ and Kanban Coaching Professionals™ follow the Kanban Method for evolutionary organizational change.

Kanban University offers accreditation for Kanban trainers, a professional designation for Kanban coaches, and certification for Kanban practitioners.

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KANBAN AT VANGUARD
An Experience Report