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Kanban is a system to control the logistical chain from a production point of view, and is an inventory control system. **Kanban** was developed by Taiichi Ohno, an industrial engineer at Toyota, as a system to improve and maintain a high level of production. **Kanban** is one method to achieve JIT.

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Kanban is a system to control the logistical chain from a production point of view, and is an inventory control system. **Kanban** was developed by Taiichi Ohno, an industrial engineer at Toyota, as a system to improve and maintain a high level of production.

Kanban is one method to achieve JIT.

Purpose: Logistic control system **Implemented at:** Toyota**Date implemented:** 1953**Developer:** [Taiichi Ohno](#)

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Kanban is a new technique for managing a software development process in a highly efficient way. **Kanban** underpins Toyota's "just-in-time" (JIT) production system.

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Kanban is Japanese for "visual signal" or "card." Toyota line-workers used a **kanban** (i.e., an actual card) to signal steps in their manufacturing process.

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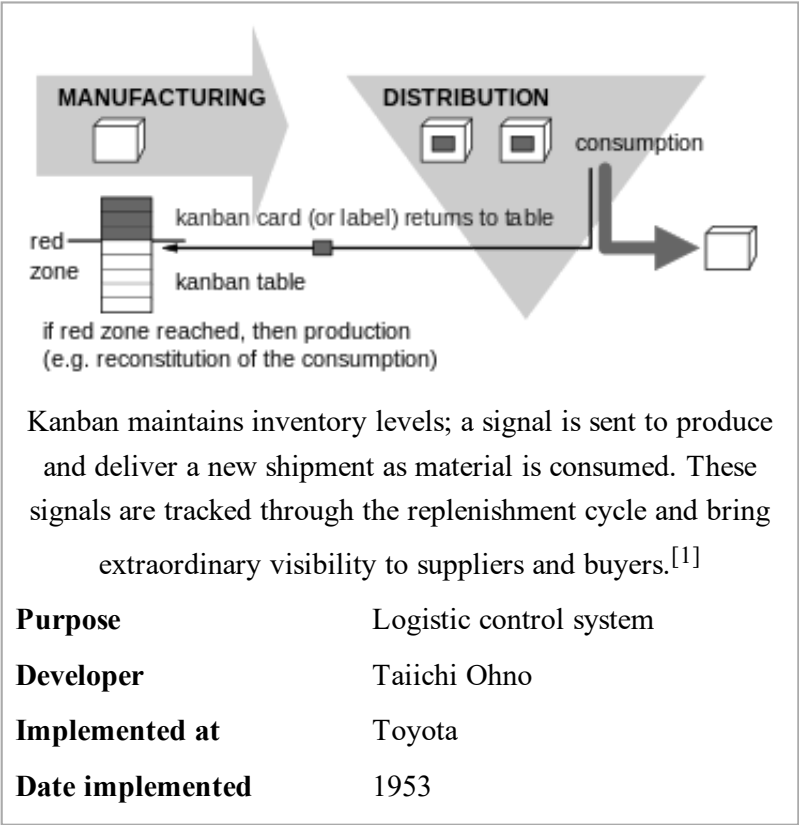
Kanban

From Wikipedia, the free encyclopedia

Kanban (かんばん) (literally signboard or billboard in Japanese) is a scheduling system for lean and just-in-time (JIT) production.^[2] Kanban is a system to control the logistical chain from a production point of view, and is an inventory control system. Kanban was developed by Taiichi Ohno, an industrial engineer at Toyota, as a system to improve and maintain a high level of production. Kanban is one method to achieve JIT.^[3]

Kanban became an effective tool to support running a production system as a whole, and an excellent way to promote improvement. Problem areas are highlighted by reducing the number of kanban in circulation.^[4] One of the main benefits of kanban is to establish an upper limit to the work in progress inventory, avoiding overloading of the manufacturing system. Other systems with similar effect are for example CONWIP.^[5] A systematic study of various configurations of kanban systems, of which CONWIP is an important special case, can be found in Tayur (1993), among other papers.^{[6][7][8][9]}

Kanban Principles



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- 2 Operation
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Origins

In the late 1940s, Toyota started studying supermarkets with the idea of applying shelf-stocking techniques to the factory floor. In a supermarket, customers generally retrieve what they need at the required time—no more, no less. Furthermore, the supermarket stocks only what it expects to sell in a given time, and customers take only what they need, since future supply is assured. This observation led Toyota to view a process as being a customer of one or more preceding processes, and to view the preceding processes as a kind of store. The "customer" process goes to the store to get required components, which in turn causes the store to restock. Originally, as in supermarkets, signboards guided "shopping" processes to specific shopping locations within the store.

Kanban aligns inventory levels with actual consumption. A signal tells a supplier to produce and deliver a new shipment when material is consumed. These signals are tracked through the replenishment cycle, bringing visibility to the supplier, consumer, and buyer.

Kanban uses the rate of demand to control the rate of production, passing demand from the end customer up through the chain of customer-store processes. In 1953, Toyota applied this logic in their main plant machine shop.^[10]

Operation

One key indicator of the success of production scheduling based on demand, *pushing*, is the ability of the demand-forecast to create such a *push*. Kanban, by contrast, is part of an approach where the "pull" comes from demand. Re-supply or production is determined according to the actual demand of the customer. In contexts where supply time is lengthy and demand is difficult to forecast, often, the best one can do is to respond quickly to observed demand. This situation is exactly what a kanban system accomplishes, in that it is used as a demand signal that immediately travels through the supply chain. This ensures that intermediate stock held in the supply chain are better managed, and are usually smaller. Where the supply response is not quick enough to meet actual demand fluctuations, thereby causing potential lost sales, stock building may be deemed more appropriate, and is achieved by placing more kanban in the system.

Taiichi Ohno stated that, to be effective, kanban must follow strict rules of use.^[11] Toyota, for example, has six simple rules, and close monitoring of these rules is a never-ending task, thereby ensuring that the kanban does what is required.

Toyota's Six Rules

Toyota have formulated six rules for the application of kanban:^[12]

- Later process picks up the number of items indicated by the kanban at the earlier process.
- Earlier process produces items in the quantity and sequence indicated by the kanban.
- No items are made or transported without a kanban.
- Always attach a kanban to the goods.
- Defective products are not sent on to the subsequent process. The result is 100% defect-free goods.
- Reducing the number of kanban increases the sensitivity.

Kanban cards

Kanban cards are a key component of kanban and they signal the need to move materials within a production facility or to move materials from an outside supplier into the production facility. The kanban card is, in effect, a message that signals depletion of product, parts, or inventory. When received, the kanban triggers replenishment of that product, part, or inventory. Consumption, therefore, drives demand for more production, and the kanban card signals demand for more product—so kanban cards help create a demand-driven system.

It is widely held by proponents of lean production and manufacturing that demand-driven systems lead to faster turnarounds in production and lower inventory levels, helping companies implementing such systems be more competitive.

In the last few years, systems sending kanban signals electronically have become more widespread. While this trend is leading to a reduction in the use of kanban cards in aggregate, it is still common in modern lean production facilities to find use of kanban cards. In various software systems, kanban is used for signalling demand to suppliers through email notifications. When stock of a particular component is depleted by the quantity assigned on kanban card, a "kanban trigger" is created (which may be manual or automatic), a purchase order is released with predefined quantity for the supplier defined on the card, and the supplier is expected to dispatch material within a specified lead-time.^[13]

Kanban cards, in keeping with the principles of kanban, simply convey the need for more materials. A red card lying in an empty parts cart conveys that more parts are needed.

Three-bin system

An example of a simple kanban system implementation is a "three-bin system" for the supplied parts, where there is no in-house manufacturing. One bin is on the factory floor (the initial demand point), one bin is in the factory store (the inventory control point), and one bin is at the supplier. The bins usually have a removable card containing the product details and other relevant information—the classic kanban card.

When the bin on the factory floor is empty (because the parts in it were used up in a manufacturing process), the empty bin and its kanban card are returned to the factory store (the inventory control point). The factory store replaces the empty bin on the factory floor with the full bin from the factory store, which also contains a kanban card. The factory store sends the empty bin with its kanban card to the supplier. The supplier's full product bin, with its kanban card, is delivered to the factory store; the supplier keeps the empty bin. This is the final step in the process. Thus, the process never runs out of product—and could be described as a closed loop, in that it provides the exact amount required, with only one spare bin so there is never oversupply. This 'spare' bin allows for uncertainties in supply, use, and transport in the inventory system. A good kanban system calculates just enough kanban cards for each product. Most factories that use kanban use the coloured board system (heijunka box).

Electronic kanban

Many manufacturers have implemented **Electronic kanban** (sometimes referred to as E-kanban^[14]) systems.^[15] These help to eliminate common problems such as manual entry errors and lost cards.^[16] E-kanban systems can be integrated into enterprise resource planning (ERP) systems, enabling real-time demand signaling across the supply chain and improved visibility. Data pulled from e-kanban systems can be used to optimize inventory levels by better tracking supplier lead and replenishment times.^[17]

E-kanban is a signaling system that uses a mix of technology to trigger the movement of materials within a manufacturing or production facility. Electronic kanban differs from traditional kanban in that it uses technology to replace traditional elements such as kanban cards with barcodes and electronic messages.

A typical electronic kanban system marks inventory with barcodes, which workers scan at various stages of the manufacturing process to signal usage. The scans relay messages to internal/external stores to ensure restocking of products. Electronic kanban often uses the internet as a method of routing messages to external suppliers^[18] and as a means to allow a real time view of inventory, via a portal, throughout the supply chain.

Organizations such as the Ford Motor Company^[19] and Bombardier Aerospace have used electronic kanban systems to improve processes. Systems are now widespread from single solutions or bolt on modules to ERP systems.

Types of kanban systems

In a kanban system, adjacent upstream and downstream workstations communicate with each other through their cards, where each container has a kanban associated with it. The two most important types of kanbans are:^[20]

- **Production (P) Kanban:** A P-kanban, when received, authorizes the workstation to produce a fixed amount of products. The P-kanban is carried on the containers that are associated with it.
- **Transportation (T) Kanban:** A T-kanban authorizes the transportation of the full container to the downstream workstation. The T-kanban is also carried on the containers that are associated with the transportation to move through the loop again.

See also

- Backflush accounting
- CONWIP
- Material requirements planning
- Manufacturing resource planning
- Scheduling (production processes)
- Supply chain management
- Drum-buffer-rope
- List of software development philosophies
- Lean software development
- Visual control

- Continuous-flow manufacturing
- Kanban (development)
- Just in time (business)
- Lean manufacturing

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- Louis, Raymond (2006). *Custom Kanban: Designing the System to Meet the Needs of Your Environment*. University Park, IL: Productivity Press. ISBN 978-1-56327-345-2.

External links

- Toyota: Kanban System ([http://www.toyota-](http://www.toyota-global.com/company/vision_philosophy/toyota_production_system/just-in-time.html)



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Kanban (development)

From Wikipedia, the free encyclopedia

Kanban is a method for managing knowledge work with an emphasis on just-in-time delivery while not overloading the team members. This approach presents all participants with a full view of the process from task definition to delivery to a customer. Team members pull work from a queue.

Kanban in the context of software development can mean a visual process-management system that tells what to produce, when to produce it, and how much to produce - inspired by the Toyota Production System^[1] and by Lean manufacturing.^[2]

Contents

- 1 Overview
- 2 The Kanban Method
- 3 Open Kanban
- 4 Examples
- 5 Outside of software development
- 6 See also
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Overview

David Anderson was among the first to formulate the Kanban Method for application to IT and software development in his 2010 book *Kanban*.^[3] A notable earliest contribution came from Corey Ladas, whose 2009 book *Scrumban*^[4] was the first to suggest that Kanban was a superior alternative to Scrum for software development. Corey's book saw Scrumban as the transition from the starting point of Scrum to the destination of Kanban.

More recently, in 2013, Joseph Hurtado introduced Open Kanban (<https://github.com/agilelion/Open-Kanban>), an open source, minimal, Agile and Lean method that is designed to be extended and customized. In addition, the Kanban Ace (<http://agilelion.com/why-learn-kanban-ace#Kanban-Ace-Method>) was written as an extension of Open Kanban particularly suited to software development.

The Kanban Method

Formulated by David Anderson, the Kanban Method is as an approach to incremental, evolutionary process and systems change for organizations. It uses a work-in-progress limited pull system as the core mechanism to expose system operation (or process) problems and stimulate collaboration to continuously improve the system. Visualisation is an important aspect of Kanban as it allows to understand the work and the workflow.^[5]

The Kanban Method is rooted in four basic principles:

Start with existing process

The Kanban method does not prescribe a specific set of roles or process steps. The Kanban method starts with existing roles and processes and stimulates continuous, incremental and evolutionary changes to the system. The Kanban method is a change management method.

Agree to pursue incremental, evolutionary change

The organization (or team) must agree that continuous, incremental and evolutionary change is the way to make system improvements and make them stick. Sweeping changes may seem more effective but have a higher failure rate due to resistance and fear in the organization. The Kanban method encourages continuous small incremental and evolutionary changes to your current system.

Respect the current process, roles, responsibilities and titles

It is likely that the organization currently has some elements that work acceptably and are worth preserving. The Kanban method seeks to drive out fear in order to facilitate future change. It attempts to eliminate initial fears by agreeing to respect current roles, responsibilities and job titles with the goal of gaining broader support.

Leadership at all levels

Acts of leadership at all levels in the organization, from individual contributors to senior management, are encouraged.

Open Kanban

Open Kanban Agile and Lean heritage is reflected in its core values: Respect for people, Courage, Focus on Value, Communication-Collaboration, and a Holistic or Systemic Approach to Change. Those values manifest in four key practices:

1. Visualize the workflow.

You cannot improve what you cannot see. Knowledge work needs a way to show progress. Kanban boards are one of the ways to display progress.

2. Lead using a team approach.

Without a team and leadership, nothing of significant value can be created or improved.

3. Reduce the Batch Size of your Efforts or Reduce BASE.

Science and the work from Donald G. Reinertsen^[6] has shown that when the batch unit of work is decreased, more can be accomplished. This principle goes beyond simply Limiting Work in Progress.

4. Learn and improve continuously.

This practice implies reflecting so that one can learn from experience, and it aligns with performing retrospectives and embracing Kaizen. In addition Open Kanban itself is open source and it welcomes contributions or extensions to the method.

Examples

Kanban Software Development Workflow^[7] complements the Scrum, XP and Waterfall models.

Workflow ⇒	Inbox	Specification		Ready for Development	Development (e.g. using Scrum and XP)			Code Review		Test on Local System		Test on Pre- Production System		Ready for Deployment	De
WIP Limit ⇒	5	2		2	3			2		2		2			
Feature		In progress	Done		Planned	In Progress	Done	In progress	Done	In progress	Done	In progress	Done		
Login	User Story 567 User Story 214		User Story 857				User Story 654				User Story 75			User Story 754	
Register				User Story 244		User Story 751									
Password Recovery	User Story 624					User Story 245			User Story 782						
...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Billing			User Story 657	User Story 38					User Story 858						
Policies ⇒	<ul style="list-style-type: none"> Product Owner writes user stories Development Team estimates user story size (planning poker) Prioritize stories Note lead start date 	Write acceptance criteria	Plan developer pairing	Note cycle start time	TDD and Refactoring	Note cycle end time	Check Policies <ul style="list-style-type: none"> Antipatterns Unit tests Integration tests Code coverage Deployment issues 		Tester and Product Owner needed	Check only code functionality				<ul style="list-style-type: none"> Ren Not Rev depl Upd 	

Outside of software development

While developed for software development and software teams, the Kanban method (as distinct from Kanban) has been applied in other areas of knowledge work.^[8] As a visualization and control mechanism, any repeatable and consistent workflow can be tracked, regardless of complexity or subject area. Business functions that have applied Kanban include:

- Human Resources^[9] and recruitment^[10] teams

- Sales and marketing teams^[11]
- Organisational strategy and executive leadership teams^[12]
- Audit teams
- Sales to Goods delivery process
- Procurements to Goods receipt process
- Contracts to Project execution process
- Accounts receivable & payable processes

See also

- Kanban
- Kanban board
- Comparison of Kanban software
- Lean software development
- List of software development philosophies
- Scrumban
- TargetProcess
- Teamwork
- Trello

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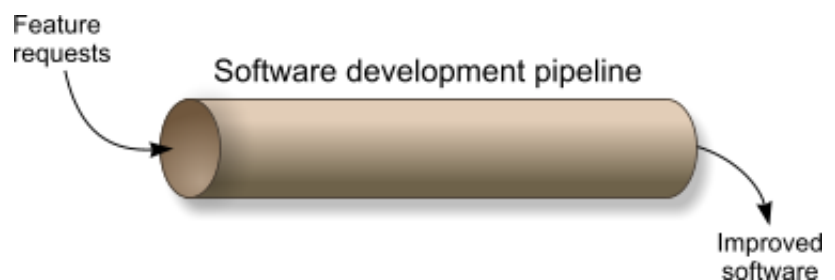
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What is Kanban?

Kanban is a new technique for managing a software development process in a highly efficient way. Kanban underpins Toyota's "just-in-time" (JIT) production system. Although producing software is a creative activity and therefore different to mass-producing cars, the underlying mechanism for managing the production line can still be applied.

A software development process can be thought of as a pipeline with feature requests entering one end and improved software emerging from the other end.



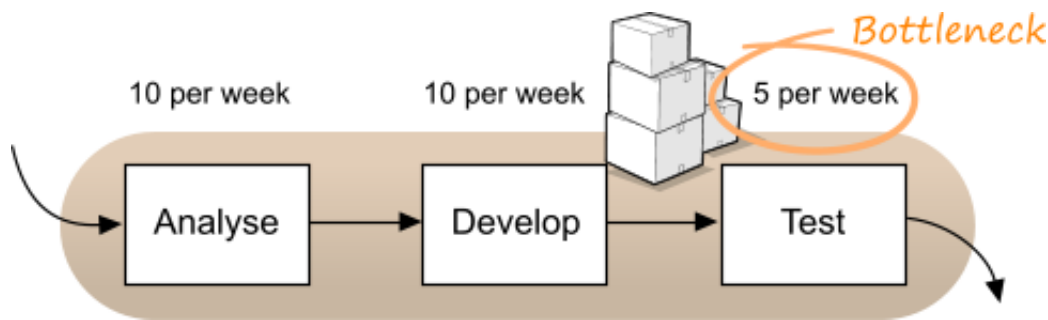
Inside the pipeline, there will be some kind of process which could range from an informal ad hoc process to a highly formal phased process. In this article, we'll assume a simple phased process of: (1) *analyse* the requirements, (2) *develop* the code, and (3) *test* it works.

The Effect of Bottlenecks

A bottleneck in a pipeline restricts flow. The throughput of the pipeline as a whole is limited to the throughput of the bottleneck.

Using our development pipeline as an example: if the testers are only able to test 5 features per week whereas the developers and analysts have the capacity to produce 10 features per week, the throughput of the pipeline as a whole will only be 5 features per week because the testers are acting as a bottleneck.

If the analysts and developers *aren't aware* that the testers are the bottleneck, then a backlog of work will begin to pile up in front of the testers.



The effect is that lead times go up. And, like warehouse stock, work sitting in the pipeline ties up investment, creates distance from the market, and drops in value as time goes by.

Inevitably, quality suffers. To keep up, the testers start to cut corners. The resulting bugs released into production cause problems for the users and waste future pipeline capacity.

If, on the other hand, we knew where the bottleneck was, we could redeploy resources to help relieve it. For example, the analysts could help with testing and the developers could work on test automation.

But how do we know where the bottleneck is in any given process? And what happens when it moves?

Kanban reveals bottlenecks dynamically

Kanban is incredibly simple, but at the same time incredibly powerful. In its simplest incarnation, a kanban system consists of a big board on the wall with cards or sticky notes placed in columns with numbers at the top.

The cards represent work items as they flow through the development process represented by the columns. The numbers at the top of each column are limits on the number of cards allowed in each column.

The limits are the critical difference between a kanban board and any other visual storyboard. Limiting the amount of work-in-progress (WIP), at each step in the process, prevents overproduction and reveals

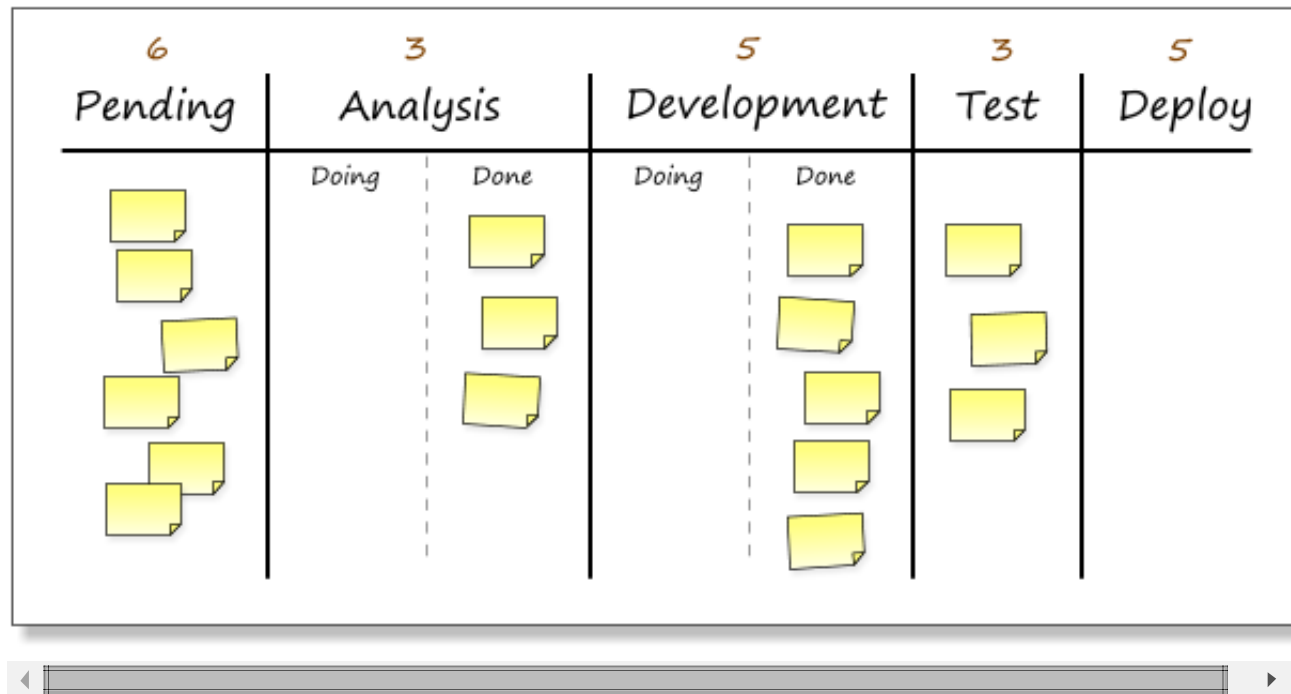
bottlenecks dynamically so that you can address them before they get out of hand.

Limiting work-in-progress reveals the bottlenecks so you can address them.

Worked Example

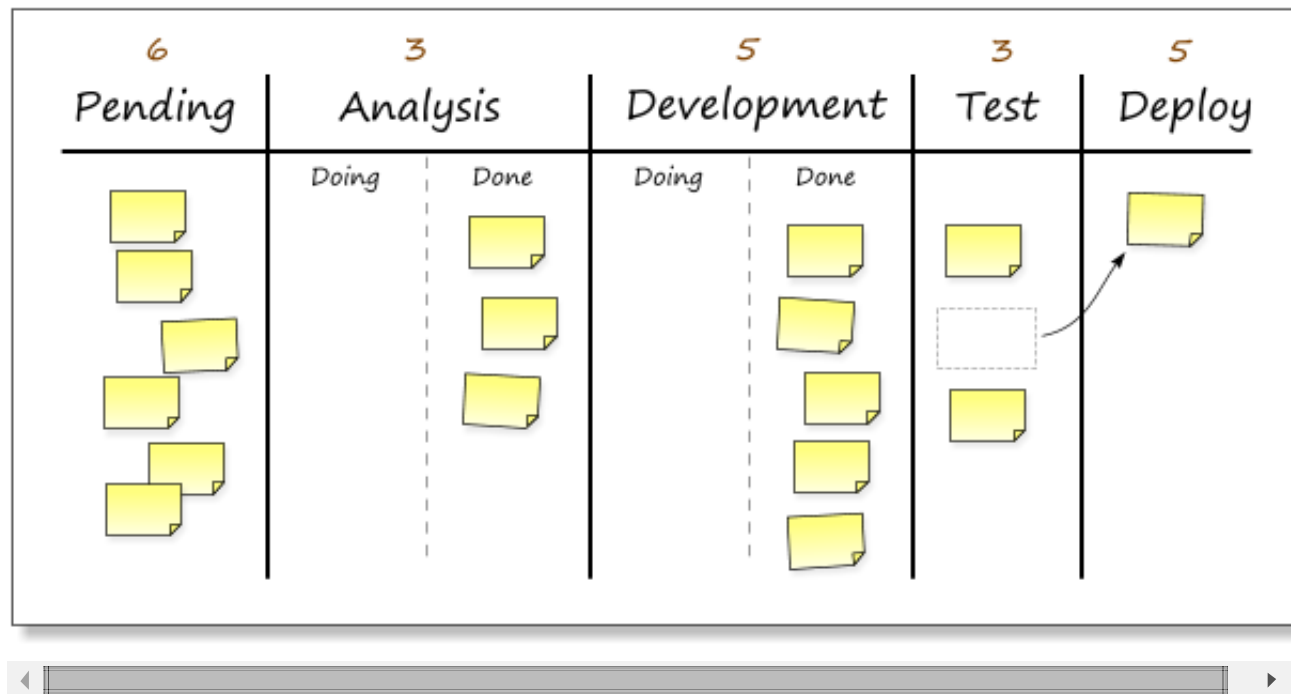
The board below shows a situation where the developers and analysts are being prevented from taking on any more work until the testers free up a slot and pull in the next work item. At

this point the developers and analysts should be looking at ways they can help relieve the burden on the testers.

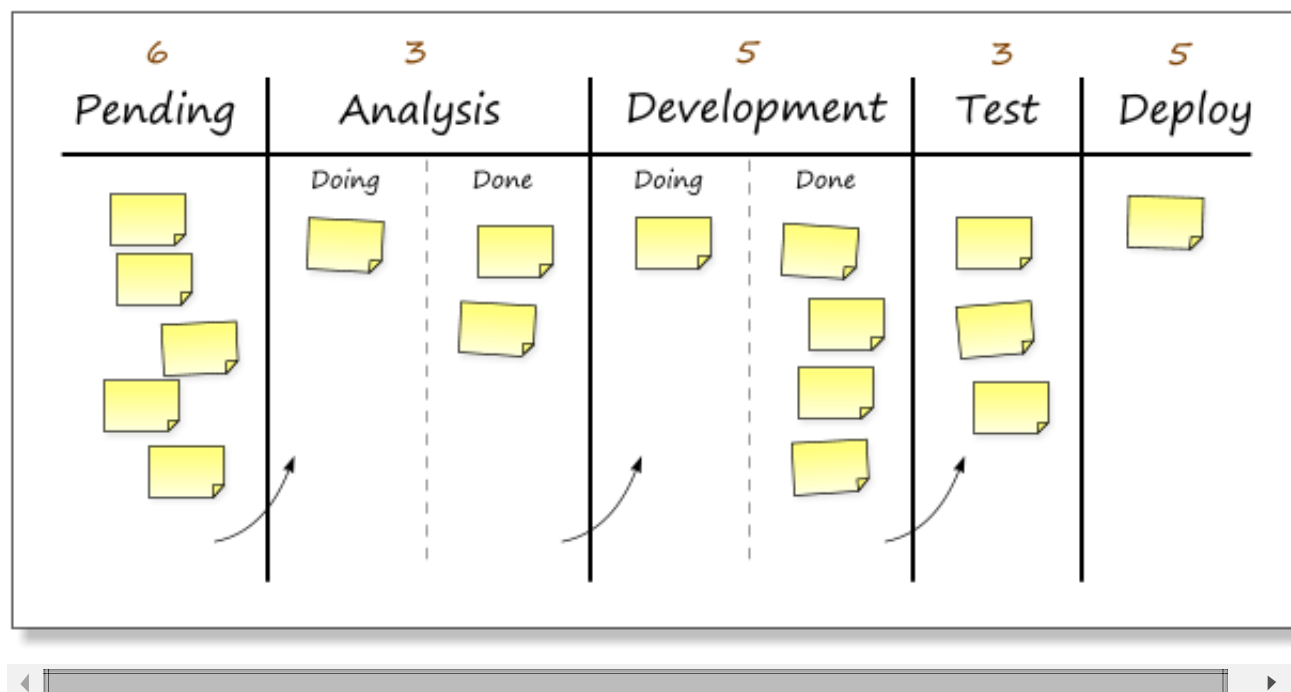


Notice that we've split some of the columns in two, to indicate items being worked on and those finished and ready to be pulled by the downstream process. There are several different ways you can layout out the board. This is a fairly simple way. The limits at the top of the split columns cover both the "doing" and "done" columns.

Once the testers have finished testing a feature, they move the card and free up a slot in the "Test" column.



Now the empty slot in the "Test" column can be filled by one of the cards in the development "done" column. That frees up a slot under "Development" and the next card can be pulled from the "Analysis" column and so on.



Next steps

[Getting started with Kanban](#)

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WHAT IS KANBAN?

A (Very) Short History of Kanban

In the late 1940s, Toyota found a better engineering process from an unlikely source: the supermarket. They noticed that store clerks restocked a grocery item by their store's inventory, not their vendor's supply.

Only when an item was near sellout did the clerks order more. The grocers' "just-in-time" delivery process sparked Toyota engineers to rethink their methods and pioneer a new approach—a Kanban system—that would match inventory with demand and achieve higher levels of quality and throughput.

So how'd they do all that?

In simplest terms, by better communication through visual management.

Kanban is Japanese for "visual signal" or "card." Toyota line-workers used a kanban (i.e., an actual card) to signal steps in their manufacturing process. The system's highly visual nature allowed teams to communicate more easily on

what work needed to be done and when. It also standardized cues and refined processes, which helped to reduce waste and maximize value.

A new application of Kanban emerged for knowledge work as early as 2005, and an inquisitive community formed in 2007 around the leadership of David J. Anderson, Jim Benson, Corey Ladas and others. Their resulting body of knowledge was influenced not only by the Toyota Production System but also by the work of W. Edwards Deming, Eliyahu Goldratt, Donald Reinertsen and other thought leaders.

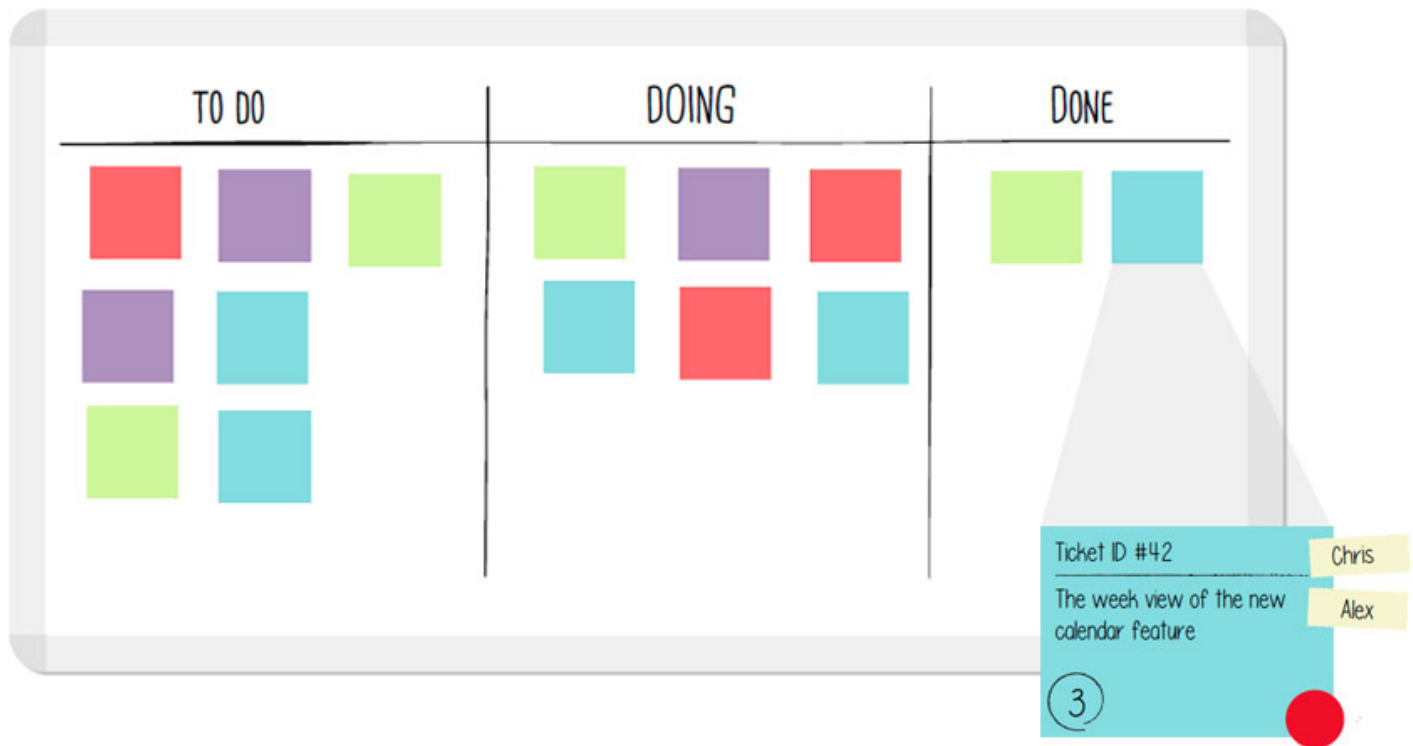
Kanban Today and Why it Works

Today's workforce may be armed with retina-worthy smartphones and tablets, but plenty of information still comes our way as words on a screen. Emails, spreadsheets, task lists—text is everywhere. While it fits certain scenarios, textual information is not a one-size-fits-all communication vehicle. Its effectiveness is lower than you might think.

It starts with your brain.

A picture is worth a thousand words for scientific reasons: The brain processes visual information 60,000 times faster than text. Forty percent of all nerve fibers connected to the brain are linked to the retina. Visual information comprises 90 percent of the data that comes to our brain, suggesting that our neurological pathways might even prefer pictorial displays over text.

Kanban helps you harness the power of visual information by using sticky notes on a whiteboard to create a “picture” of your work. Seeing how your work flows within your team's process lets you not only communicate status but also give and receive context for the work. Kanban takes information that typically would be communicated via words and turns it into brain candy.



Four Core Kanban Principles

Unlike other methods that force fit change, Kanban is a method of work management that focuses on evolution, not revolution. It hinges on the principle of continuous improvement, where you want to go without first knowing where you are.

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Kanban is gaining traction as a way to smoothly implement Agile and Lean management methods in tech and non-tech companies around the world. Throughout this fresh take on Toyota's manufacturing process, Kanban's core elements have remained rooted in the principles below. (Note: There are many ways to define Kanban. Our intent in listing the core elements in this manner is not to introduce a new definition but to distill the common principles.)

1. Visualize Work

By creating a visual model of your work and workflow, you can observe the flow of work moving through your Kanban system. Making the work visible—along with blockers, bottlenecks and queues—instantly leads to increased

communication and collaboration.

2. Limit Work in Process

By limiting how much unfinished work is in process, you can reduce the time it takes an item to travel through the Kanban system. You can also avoid problems caused by task switching and reduce the need to constantly reprioritize items.

3. Focus on Flow

By using work-in-process (WIP) limits and developing team-driven policies, you can optimize your Kanban system to improve the smooth flow of work, collect metrics to analyze flow, and even get leading indicators of future problems by analyzing the flow of work.

4. Continuous Improvement

Once your Kanban system is in place, it becomes the cornerstone for a culture of continuous improvement. Teams measure their effectiveness by tracking flow, quality, throughput, lead times and more. Experiments and analysis can change the system to improve the team's effectiveness.

[Free eBook] Kanban Roadmap: How to Get Started in 5 Steps

At LeanKit, we've created a five-step guide for those interested in trying Kanban with their team. Each step in the Kanban Roadmap includes a team activity, real-world examples and helpful tips for team members and team leaders alike. Download your free copy of the Kanban Roadmap: How to Get Started in 5 Steps eBook to learn more about how to practice Kanban with your team.

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[Remote teams](#)

Kanban is another framework used to implement agile. Back in the 1940s, Toyota optimized its engineering process by modeling it after how supermarkets stock shelves. Supermarkets stock just enough product to meet consumer demand, a practice that optimizes the flow between the supermarket and the consumer. Because inventory levels match with consumption patterns, the supermarket gains significant efficiency in inventory management and optimizing for the customer. When Toyota brought that idea to its factory floors, teams (such as the team that attaches the doors to the car's frame) would deliver a card, or "kanban", to each other (say, to the team that assembles the doors) to signal that they have excess capacity and are ready to pull more materials. Although the

Product discussed

 **JIRA Software**
Project and issue tracking

[Workflows](#)[Working with specialists](#)

[The Agile Program](#)

[The Agile Portfolio](#)

[Watch & Learn](#)

signaling technology has evolved, this system is still at the core of "just in time" manufacturing today.

Kanban does the same for software teams. By matching the amount of [work in progress](#) to the team's capacity, kanban gives teams more flexible planning options, faster output, clear focus, and transparency throughout the development cycle.

Flexibility in planning

A kanban team is only focused on the work that's actively in progress. Once the team completes a work item, they pluck the next work item off the top of the [backlog](#). The [product owner](#) is free to re-prioritize work in the backlog without disrupting the team, because any changes outside the current work items don't impact the team. As long as the product owner keeps the most important work items on top of the backlog, the development team is assured they are delivering maximum value back to the business. So there's no need for the fixed-length iterations you find in scrum.

ProTip: Savvy product owners always engage the development team when considering changes to the backlog. For example, if user stories 1-6 are in the backlog, user story 6's [estimate](#) may be based on the completion of user stories 1-5. It's always a good practice to confirm changes with the engineering team to ensure there are no surprises.

Minimizing cycle time

Cycle time is a key **metric** for kanban teams. Cycle time is the amount of time it takes for a unit of work to travel through the team's workflow—from the moment work starts to the moment it ships. By optimizing cycle time, the team confidently forecast the delivery of future work.

Overlapping skill sets lead to smaller cycle times. When only one person holds a skill set, that person becomes a bottleneck in the workflow. So teams employ basic best practices like code review and mentoring help to spread knowledge. Shared skills mean that team members can take on heterogeneous work, which further optimizes cycle time. It also means that if there is a backup of work, the entire team can swarm on it to get the process flowing smoothly again. For instance, testing isn't only done by QA engineers. Developers pitch in too!

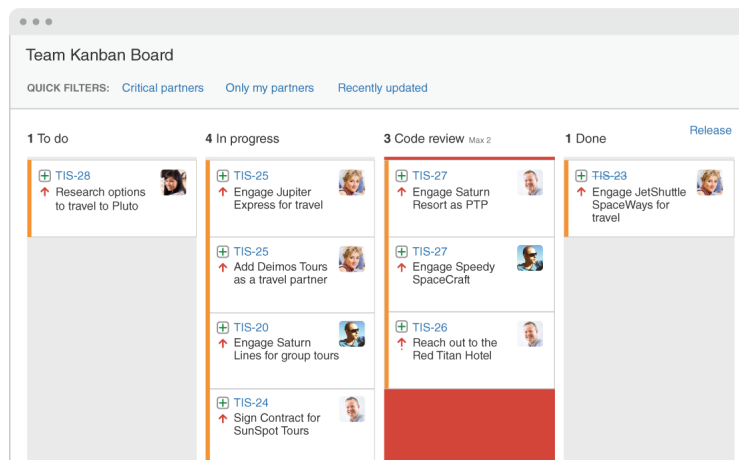
In a kanban framework, it's the entire team's responsibility to ensure work is moving smoothly through the process.

Efficiency through focus

Multitasking kills efficiency. The more work items in flight at any given time, the more context switching, which hinders their path to completion. That's why a key tenant of kanban is to limit the amount of work in progress (WIP). Work-in-progress limits highlight bottlenecks and backups in the team's process due to lack of focus, people, or skill sets.

For example, a typical software team might have four **workflow** states: to do, in progress, code review, and done. They could choose to set a

WIP limit of 2 for the code review state. That might seem like a low limit, but there's good reason for it: code that hasn't been reviewed not only hasn't shipped yet, but may need significant re-work before it is ready to ship. So it's important to take action on code reviews right away, and setting a WIP limit helps the team hold themselves accountable to that. It forces the team to knock out those reviews before pulling in new work.



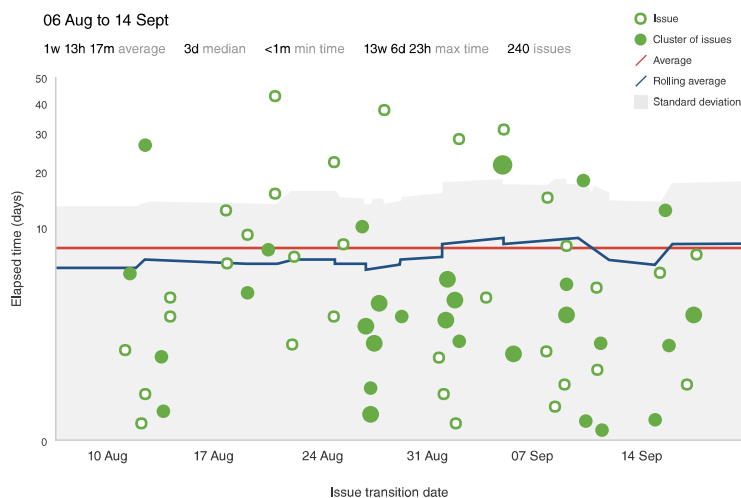
Making metrics visual

One of kanban's core values is continuous improvement. But how do teams ensure they're continuing to improve? One word: visuals. When the team can see data, it's easier to spot bottlenecks in the process (and remove them!). Two common reports kanban teams use are control charts and cumulative flow diagrams.

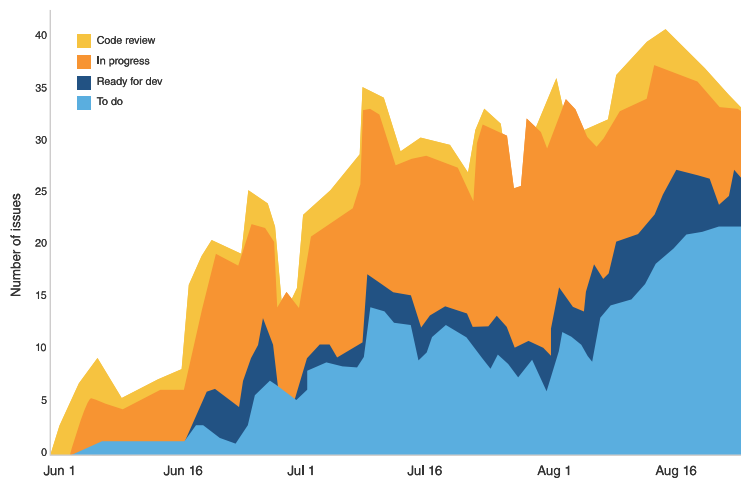
A control chart shows the cycle time for each issue as well as a rolling average for the team.

ProTip: The team's goal is to reduce the amount of time an issue takes to move through the entire process. Seeing the

average cycle time drop in the control chart is an indicator of success.



A cumulative flow diagram shows the number of issues in each state. The team can easily spot blockages by seeing the number of issues increase in any given state. We can see in the chart below the amount of code waiting to be merged (red) significantly increases over time. This creates a bottleneck that denies the customer of features and fixes that have already built, and increases the likelihood of massive integration conflicts when the work does get merged upstream.



In the example above, the team realizes the

backup just before 1 September and quickly swarms to bring the amount of un-merged code back down to an acceptable level.

Moving toward continuous delivery

We know that **continuous integration**—the practice of building and validating code incrementally throughout the day—is essential for maintaining quality. Now let's meet CI's older, more sophisticated cousin: continuous delivery (CD). This is the practice of releasing work to customers frequently—even daily or hourly. Kanban and CD beautifully complement each other because both techniques focus on the just-in-time (and *one-at-a-time*) delivery of value.

The faster a team can deliver innovation to market, the more competitive their product will be in the marketplace. And kanban teams focus on exactly that: optimizing the flow of work out to customers.

Scrum vs. kanban

Kanban and **scrum** share some of the same concepts but have very different approaches. They should not be confused with one another.

	SCRUM	KANBAN
Cadence	Regular fixed length sprints (ie, 2 weeks)	Continuous flow
Release methodology	At the end of each sprint if	Continuous delivery or

	approved by the product owner	at the team's discretion
Roles	Product owner, scrum master, development team	No existing roles. Some teams enlist the help of an agile coach.
Key metrics	Velocity	Cycle time
Change philosophy	Teams should strive to not make changes to the sprint forecast during the sprint. Doing so compromises learnings around estimation.	Change can happen at any time

Some teams blend the ideals of kanban and scrum into "scrumban." They take fixed length sprints and roles from scrum and the focus on work in progress limits and cycle time from kanban. For teams just starting out with agile, however, we strongly recommend choosing one methodology or the other and running with it for a while. You can always get fancy later on.

RECOMMENDED READS

ABOUT THE AUTHOR

PUT IT INTO PRACTICE

Get serious about kanban

Agile project management for scrum and kanban teams. (And lean, and scrumban...) [Explore JIRA Software](#)

COMING UP NEXT

Think globally, code locally

Distributed teams are here to stay, but can they thrive in an agile environment? We think yes. [Keep reading](#)

ON A RELATED NOTE...

Understanding an agile board

Learn the elements of JIRA Software's agile boards, and how to use them to keep your team on the same page. [Dive in](#)



**Dan
Radigan**

Senior Agile
Evangelist,

Atlassian

Agile has had a huge impact on me both professionally and personally as I've learned the best experiences are agile, both in code and in life. You'll often find me at the intersection of technology, photography, and motorcycling. Find me on Twitter! [@danradigan](#)

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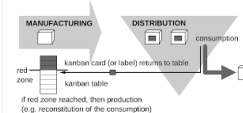
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Board

Part Description	Part Number
Smoke-shifter, left handed.	14613
Qty 30	Lead Time 1 week
Supplier Acme Smoke Shifter, LLC	Order Date 9/3
Planner John R.	Due Date 7/10
	Card Lot 2
	Location Rack 183

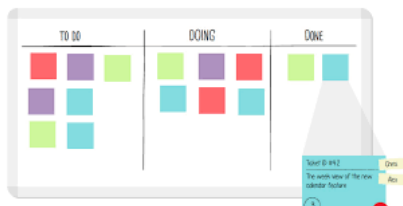
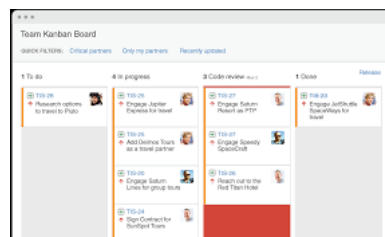
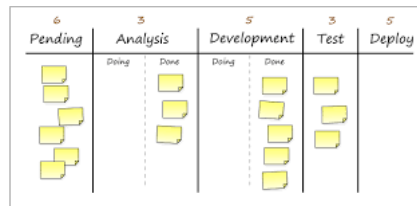
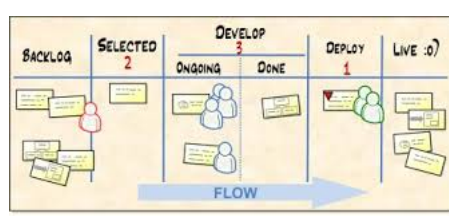
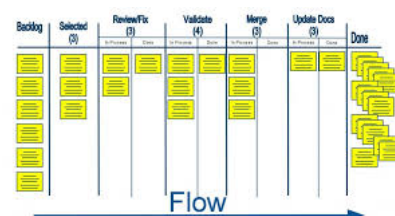
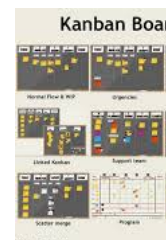
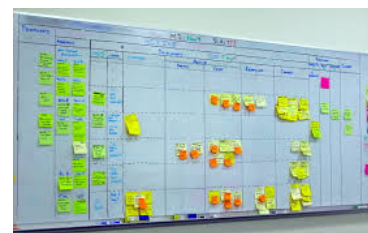
Card



System

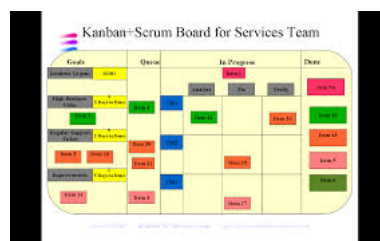
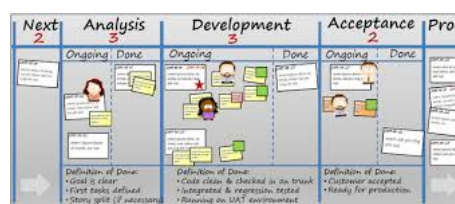
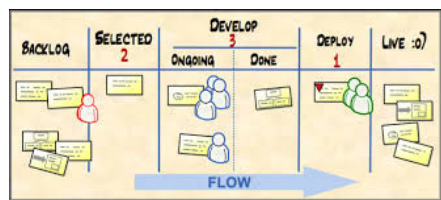
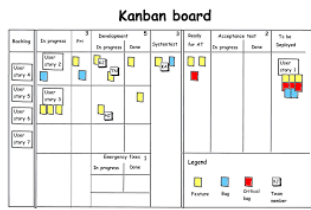
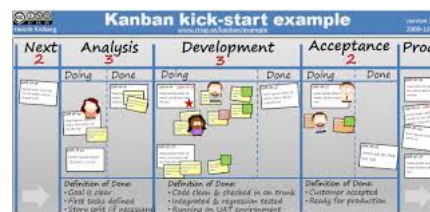
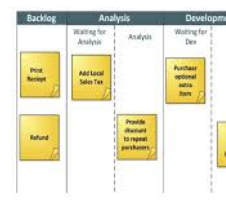
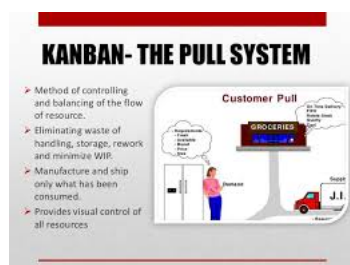
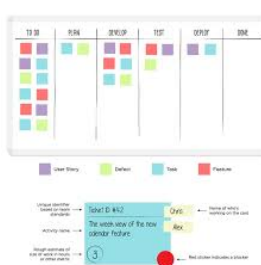
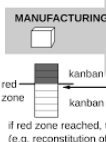


Toyota



Scrum

SCRUM



SCRUM

Work is done within time-boxed sprints, generally of 2-4 weeks. The goal is to produce a potentially shippable product after each sprint.

Product is released on a particular cadence, which is determined by the sprint length. So a team may release after 3 sprints, or every 6 weeks.

There's a heavy focus on cross-functionality. Teams have no specified roles; everyone is a "marketer."

Sprint kickoffs, daily standups, sprint reviews, and sprint retrospectives are vital rituals within the Scrum process.

KANBAN

There are no fixed-length sprints. Instead teams pull tasks from a prioritized backlog of things that need to be done.

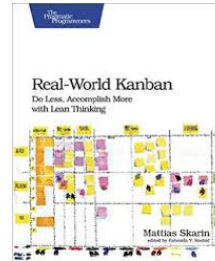
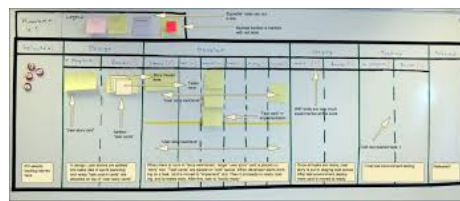
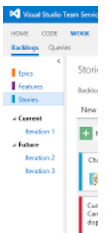
Releases occur continuously, or whenever there is a shippable product created.

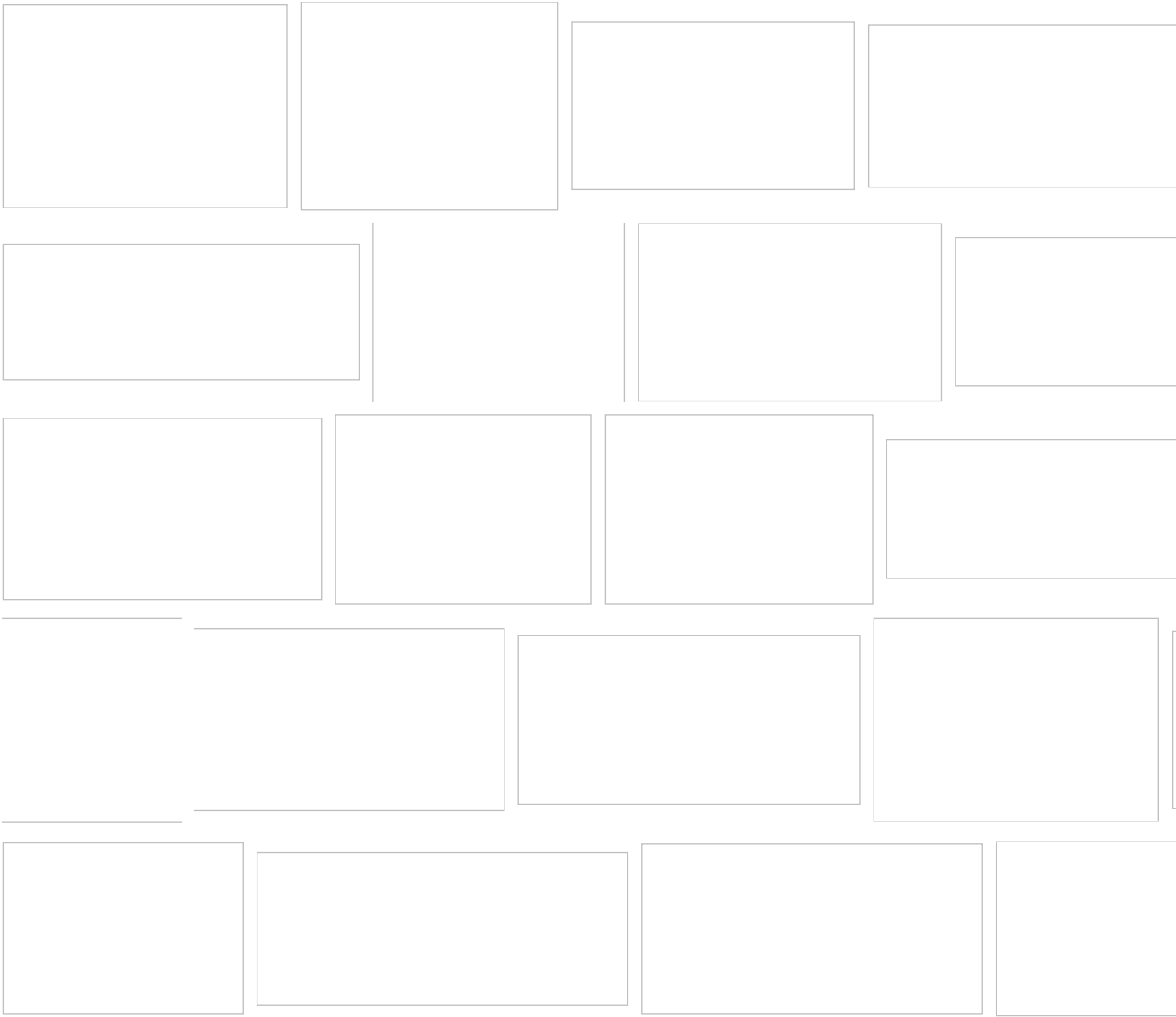
Team members can specialize and pull tasks related to their area of expertise, but too much specialization will reduce a team's effectiveness.

There is an emphasis on continually improving processes, but no standardized regular meetings or rituals.

AGILE / LEAN / KANBAN

12/10/2013 Sudipta Lahiri, Digitale





EVERYDAY KANBAN

Discussing Management, Teams, Agile, Lean, Kanban & more

What is Kanban?

The Kanban Method, as formulated by David J. Anderson, is an approach to incremental, evolutionary process and systems change for organizations. My layman's way of describing Kanban is that it is

1. a way to organize the chaos that surrounds so many delivery teams by making the need for prioritization and focus clear.
2. a way to uncover workflow and process problems so you may solve them in order to deliver more consistently to your client/customer/etc.

Kanban accomplishes these things by introducing constraints into the system to optimize the flow of value. Flow is king.

Just remember that you want to focus on the flow of *VALUE*! If you have great flow but what's being sent through isn't valuable then your work has been for naught.

If you can't get your business value flowing out the door consistently, your business is not performing optimally. In addition to the above, by focusing on

flow, Kanban resets your brain to value finishing over starting.

Stop starting and start finishing!

It sounds like common sense right? Well, if you're like most developers you have been conditioned into associating your value with what you have started.

Kanban reminds you to stop starting and start finishing!

Kanban has 9 things you need to know. They are broken down into four basic principles (how you need to think) and five for properties (what you need to do).

Basic Principles

1) Start with what you do now

The Kanban method does not prescribe a certain setup or procedure. You can overlay Kanban properties on top of your existing workflow or process to bring your issues to light so that you can introduce positive change over time. This makes it very easy to begin a Kanban implementation as you do not have to make sweeping changes.

2) Agree to pursue incremental, evolutionary change

The Kanban method is an approach to change management that is designed to meet minimal resistance. Therefore it encourages continuous small incremental and evolutionary changes to your current system. Sweeping changes are discouraged because they generally encounter increased resistance due to fear or uncertainty. I call it "baby steps to awesomeness!"

3) Respect the current process, roles, responsibilities & titles

Kanban recognizes that there may be value in the existing process, roles, responsibilities, & titles. You have existing pieces in the way you do what you do that are working properly and worth preserving. Kanban doesn't prohibit

change, but it doesn't prescribe it either. If you do make changes, Kanban encourages incremental change. Incremental change doesn't create the level of fear that impedes progress, which allows you to be broader support for your Kanban implementation. It also makes it easier to implement Kanban. Small course corrections are also just inherently easier than altering the complete process.

The first three principles were chosen specifically to avoid emotional resistance to change – David J Anderson

4) Encourage acts of leadership at all levels

Say hello to the newest Kanban method basic principle! It is something that is espoused in many methodologies and the Kanban method is no exception. You don't need to be a team lead or an executive to be a leader. Some of the best leadership comes from everyday acts from people on the front line of their respective teams. Everyone needs to be fostering a mindset of continual improvement (kaizen) to reach your optimal performance as a team/department/company. This can't be a management level activity.

Core Properties

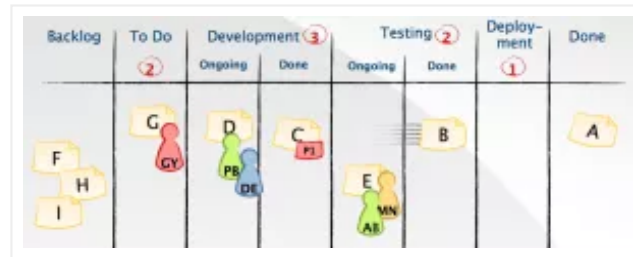
In his book, *Kanban – Successful Evolutionary Change for your Technology Business*, David Anderson identified five core properties that he consistently observed in successful implementations of the Kanban method.

1) Visualize the workflow

You have to understand what it takes to get an item from request to completion. The goal of Kanban is to make positive change to optimize the flow of work through the system. Only after understanding how the workflow currently functions can you aspire to improve it by making the correct adjustments.

Making changes before you understand your workflow is putting the proverbial cart before the horse and can cause you to make choices that are, at best, unhelpful and, at worst, harmful.

The most common way to visualize your workflow is to use card walls with cards and columns. Each column on the wall represents steps in your workflow.



Example Kanban board

I also like to recommend that you take this one step farther and visualize your incoming work requests. The ways in which this can be done are as varied as the workflows you might see out in the wild. For transactional work, the 4 categories defined by cost of delay as explained in David Anderson's book *Kanban – Successful Evolutionary Change for your Technology Business*:

- Expedite
- Fixed Date
- Standard
- Intangible

For project work, other criteria such as market risk might provide more information when classifying work. Commonly used market risk categories include:

- Differentiators
- Spoilers
- Cost reducers

- Table stakes

The big thing to remember is that there is no one right workflow or one right way to categorize your requests. Kanban doesn't prescribe a specific workflow. If I were to poll 5 different people from five different companies or groups, I could end up being presented with five different workflows and that is OK.

2) Limit WIP

Limiting work-in-progress implies that a pull system is implemented on parts or all of the workflow. The critical elements are that work-in-progress at each state in the workflow is limited and that new work is "pulled" into the next step when there is available capacity within the local WIP limit. These constraints will quickly illuminate problem areas in your flow so you can identify and resolve them. Limiting WIP is the cornerstone of Kanban.

3) Manage flow

The whole point of implementing a Kanban system is to create positive change. Before you can create that change you have to know what to change. You figure that out by looking at how value is currently flowing through the system, analyzing problem areas in which value flow is stalled and defining, then implementing, changes. Then, you repeat the cycle to see what effect your changes had on the system because you need to know if the change you made had a positive or negative impact on the things you were attempting to change. You are never finished. To use a cliché, it's a journey. Something I read recently said that when you fix your first issue, your second one gets a promotion. I think that's an awesome reminder that we should always strive to make progress.

4) Make Process Policies Explicit

As I noted in "Visualize your workflow" above, you can't improve something you don't understand. The process needs to be defined, published and socialized — explicitly and succinctly. Without an explicit understanding of how things work

and how work is actually done, any discussion of problems tends to be emotional, anecdotal and subjective (AKA a knee-jerk reaction). When everyone really understands what you are doing now and what your goals are, then you can begin to make decisions regarding change that will move you in a positive direction. The choices will be more rational, empirical, objective discussion of issues. This is more likely to facilitate consensus around improvement suggestions.

An example of a policy that you can make explicit is a definition of done. In fact, you can have a definition of done for each step in your workflow, meaning that before an item can be ready to pull forward, it has to meet certain criteria. Some tools, like LeanKit, allow you to do this in your electronic board, which I think is cool. If you have a manual board, well its easy to do there as well.

5) Improve Collaboratively (using models & the scientific method)

As discussed, the Kanban method encourages small continuous, incremental and evolutionary changes that stick. You may hear the word Kaizen when you read about Kanban. Kaizen is a word generally meaning continuous improvement. Kaizen is a key part of using Kanban effectively.

If you are not continually improving, but you are doing all of the other parts of the Kanban method, you are missing the point. Its a little like the concept of "doing" Agile but not being agile.

When teams have a shared understanding of theories about work, workflow, process, and risk, they are more likely to be able to build a shared comprehension of a problem and suggest improvement actions which can be agreed by consensus.

The Kanban method suggests that a scientific approach is used to implement continuous, incremental and evolutionary changes. There are various models

that you can use, including:

- The [Theory of Constraints](#) (the study of bottlenecks)
- The [System of Profound Knowledge](#) (a study of variation and how it affects processes)
- [Lean](#) Economic Model (based on the concepts of “waste” (or muda, muri and mura))

Summary

Check out my [Kanban 101 Prezi](#), which you are free to use to help address these ideas with those in your sphere of influence. I will likely be improving it continuously 😊

Regardless of the models you use, you need to have **regular feedback loops!** I think that some now break this out into its own item and the five core properties become six core practices. Separated or not, its crucial to success. This feedback isn't limited to responses from people. This can include analyzing metrics, getting team comments, customer reviews, etc. Feedback is anything that gives you input on how your process is working. I will go as far as to say that if you don't have feedback you are not trying to improve. You are throwing something against a wall to see if it sticks.

Sources:

- [Blog post: “The Principles of the Kanban Method” by David J Anderson](#)
- [Wikipedia: Kanban \(development\)](#)

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17 Comments

**Vidas**

OCTOBER 3, 2013 AT 5:47 AM

I think it misses one of the core components – kaizen for improvement. Where do you review your performance and update your process?

[REPLY](#)**Julia Wester** (Post author)

OCTOBER 3, 2013 AT 9:17 AM

Despite not having the word *Kaizen* mentioned (which I will rectify), the concept is covered under the last section: #5 Improve Collaboratively..

[REPLY](#)**Jagan**

OCTOBER 17, 2013 AT 3:05 AM

Very effective for a beginner..

[REPLY](#)**Bharat**

JULY 17, 2014 AT 9:36 PM

Not good. It would have been better if you have included some

technicalities. Over and above everyone knows the virtues of Kanban method

[REPLY](#)



Julia Wester (Post author)

JULY 18, 2014 AT 12:58 PM

Hi Bharat,

I completely disagree with you that everyone knows about any virtues of Kanban and thus this page is "Not good." A set of people may know, but far and wide, there are a lot of people who don't even know what it is and there are few places on the web that give the basic info in one place. This page is targeted for them. Over time I will enhance it to include more and point to more and more blog posts I write. However, thanks for reading and thanks for your feedback.

[REPLY](#)



Sonia

AUGUST 13, 2014 AT 8:51 AM

I agree, not everyone knows about Kanban. I heard about Kanban from my homeschool coordinator as a way to better organize project learning and I think it is a FANTASTIC approach! The steps listed are clear and to the point and can be applied to anything that needs improvement.

[REPLY](#)



Kelly

SEPTEMBER 3, 2014 AT 11:13 AM

I think this is a stellar introduction to Kanban! It's clear,

well written and makes sense to those who are not immersed in Agile and Lean. Thanks for creating this and making my job of introducing Kanban to non-technical teams easier.

[REPLY](#)



Leisa

JANUARY 5, 2015 AT 3:46 PM

I believe that the post accomplishes exactly what it intended to do: provide non-Kanbaners such as myself (as of 3 days ago) a well organized, clearly written overview of the precepts of this system. What is not good is making sweeping generalizations and levying detracting remarks without taking into account the objective at hand.

To the author: thanks for this great post!

[REPLY](#)



Standa jonák

OCTOBER 7, 2014 AT 3:31 AM

Kanban can be modified in many ways. How Kanban can works in sustaining departement – <http://wiretech.org/about-cloud/11-kanban-for-software-development>

[REPLY](#)



Sandeep

DECEMBER 26, 2014 AT 5:55 AM

Information put together in one place which gives good idea on kanban. Thanks and appreciate your effort. Great!

[REPLY](#)

**naveen**

FEBRUARY 18, 2015 AT 7:08 AM

Very Effective for a beginner..

[REPLY](#)**Karl**

FEBRUARY 19, 2015 AT 9:22 AM

According to workflow I can say that it has been all changed since we have [Kanban Tool](#) in our company. At the beginning we had to use 3 people for keeping proper work pace. Now we have this tool...

[REPLY](#)**Julia Lam**

FEBRUARY 26, 2015 AT 10:29 AM

Hi Julia. Thank you so much for this 101 of Kanban! I find this very informative and useful for someone is just starting to explore Kanban, like myself. I've been searching for a tool that would fit my non-technical department and think Kanban can be the answer to help with our communications issues and improve our processes. Being in a media creative environment Agile/Scrum/Waterfall doesn't fit our needs and is too structured and confining with the rules. Kanban as a continuous flow with no set iterations/sprints and adaptability to change seems to fit perfectly. I am gathering information and data to present this idea to upper management and hopefully see positive feedback/support and start implementing in the upcoming weeks. Thanks again for this great 101, it's a "gateway drug" to Kanban 😊

[REPLY](#)

**Carl kanban**

MARCH 5, 2015 AT 2:26 AM

<https://mykanzen.com> made our WIP limits much easier to adjust and manage. This aspect of Kanban was probably the most tiresome of all as we have had to constantly analyze our metrics and adjust WIP limits for the whole team. We ended up with a limit of 3 for each developer and created a swimlane for everyone to keep the board organized. We have also restricted daily buffer to 8 tasks per user at a time so they don't pull too many tasks and try to filter through them.

This article will definitely help in delivery of Kanban concept and its aspects to new users. Great resource for new users and a good reminder for practitioners who don't seem to implement the continuous improvement aspect.

[REPLY](#)**shanemurarenko@gmail.com**

MAY 19, 2015 AT 5:01 PM

Hi Julia

Thanks for pulling together this together – there is beauty in simplicity and this post epitomises that. I particularly like your prezi as it is perfectly pitched at beginner kanbanistas.

[REPLY](#)**asad**

MAY 26, 2015 AT 4:39 AM

Excellent..! i learn alot. much appreciated. Thanks

[REPLY](#)**Ciara**



FEBRUARY 16, 2016 AT 8:52 AM

Thanks for the article but still I prefer presenting Kanban by Kanban methods so by visualization, not text only 😊 I think watching this: <https://pl.pinterest.com/pin/517491813402619507/> may superbly complete the article above or make it easier to understand for those who have no time for reading all the text 😊

REPLY

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Visualize your work

The Kanban board gives you an excellent overview of your current work situation. Visualizing work in a team environment simplifies communication and lead to improved effectiveness.

Limit your work in

progress

By focusing your efforts on working on fewer items at the same time, you will get more done. Lots more actually. And you will feel less stressed.

Collaborate in real-

time

Any changes you make on the board are immediately available on all the team members' displays. You will always know what your team is working on at any moment.

Time tracking with

Pomodoro

Optionally improve your focus even more by using the popular **Pomodoro technique** for time tracking of your tasks. Track and measure any interruptions to your focus.

Fast & intuitive UI

Get things done, quickly. It takes less than 2 minutes to learn how to use KanbanFlow. The user interface is built for speed, without frustrating loading times.

Mobile support

When you are away from your computer you can use our mobile site. It works well on **Android**, **iPhone**, **Windows Phone** and most other smartphones.

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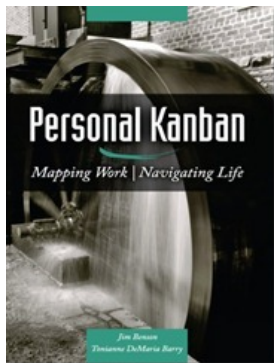
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Personal Kanban 101



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Despite our best intentions, life has a way of becoming complicated. People, tasks, responsibilities, deadlines, and even recreation all compete for our attention. The human brain however, simply does not respond well to the stress of juggling multiple priorities.

That's where Personal Kanban can help. Adaptable to all ages and situations, and accessible to all learning styles, personal kanban allows us to visualize the amount of work we have, and the way that work is carried out.

Unlike other personal productivity tools, Personal Kanban is a pattern – it is not an edict. You can mold it into whatever shape or form works best for you at the time. Personal Kanban is also scalable – it can work with just you, or with your family, or even with work groups.

Introduction to Personal Kanban



There are only two real rules with Personal Kanban:

1. Visualize your work
2. Limit your work-in-progress

It's just that simple. After you've used this "introductory" kanban for a little while, your understanding of the nature of your work will evolve. As it does, your kanban will likewise evolve.

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- [InfoPak on building your first Personal Kanban](#)

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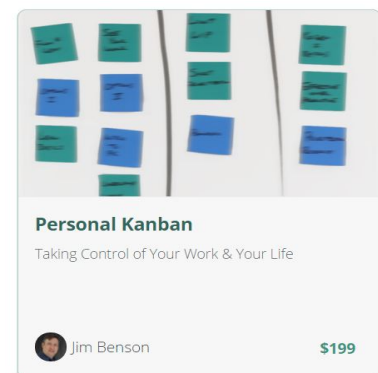
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 ★★★★★
- [Why Limit WIP: We are Drownin...](#)
 Jim Benson (Paperback - Jun 4, 2014)
\$12.95
 ★★★★★
- [Why Plans Fail: Why Business D...](#)
 Jim Benson (Paperback - Apr 15, 2014)
\$10.95
 ★★★★★

- **Building your first Personal Kanban**
- **How to build your value stream**
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 - Limiting WIP Series
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Geraldine says:

May 17, 2012 at 1:41 am

This is the first time I heard of kanban. I've had problem with getting things done and I have more work-in-progress. I have so many ideas but never managed to finish them. So let me just stick around, read, and learn.

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Nick Hoh says:

July 5, 2012 at 3:15 pm

I'm a product owner using Kanban with my team and it never struck me to do this till now.
I'm going to give this a shot myself.

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Sök

Kanban

Kanban is a lean approach to agile software development.

Actually, Kanban means many things. Literally, Kanban is a Japanese word that means “visual card”. At Toyota, Kanban is the term used for the visual & physical signaling system that ties together the whole Lean Production system. Most agile methods such as Scrum and XP are already well aligned with lean principles. In 2004, however, David Anderson (<http://agilemanagement.net/index.php/About/>) pioneered a more direct implementation of Lean Thinking (http://en.wikipedia.org/wiki/Lean_Thinking) and Theory of Constraints (http://en.wikipedia.org/wiki/Theory_of_constraints) to software development. Under the guidance of experts such as Don Reinertsen (<http://www.reinertsenassociates.com/>), this evolved into what David called a “Kanban system for software development”, and which most people now simply refer to as “Kanban”. So while Kanban as applied to software development is new, Kanban as used in Lean Production is over a half century old.

Does Kanban matter to me?

Do any of these sound familiar?

- “We’ve done Scrum for a long time now and our process improvement has levelled off. How can we take our process to the next level?”
- “Our needs and priorities shift on a daily basis”
- “We don’t like fixed-length, fixed-commitment iterations”
- “We are spending too much time planning and estimating”

If so, read on. Along with Scrum and XP, Kanban should be part of the process toolkit of any agile company. The choice of where & when to use it can only be made by you though.

How does Kanban work?

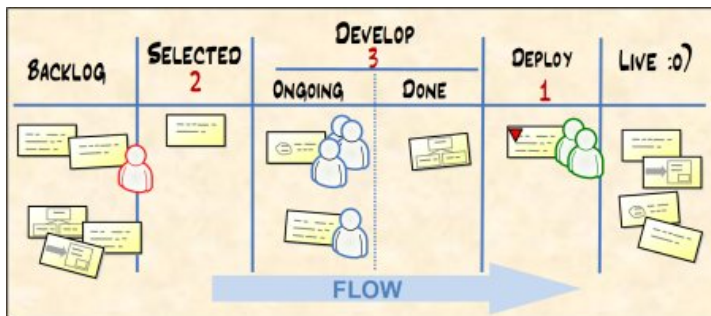
There are many flavors, but the core of Kanban means:

1. Visualize the workflow

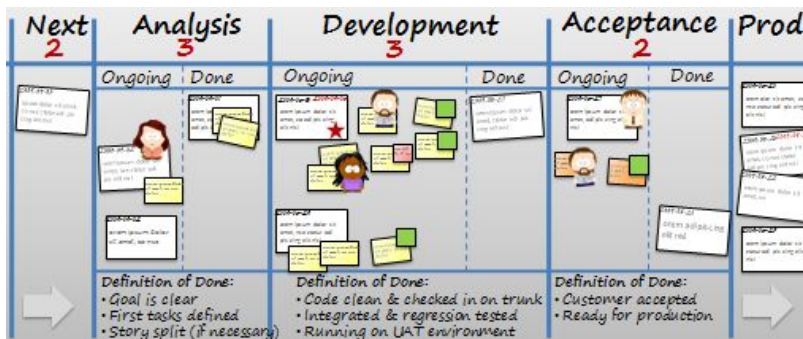
- Split the work into pieces, write each item on a card and put on the wall.
- Use named columns to illustrate where each item is in the workflow.

2. **Limit WIP** (work in progress) – assign explicit limits to how many items may be in progress at each workflow state.
3. **Measure the lead time** (average time to complete one item, sometimes called “cycle time”), optimize the process to make lead time as small and predictable as possible.

This is a direct implementation of a lean pull scheduling system. Here's an example of a simple Kanban board, with WIP limits in red.



Here's a more complex one (see Kanban kick-start example (<http://blog.crisp.se/henrikkniberg/2009/11/16/1258359420000.html>) for a closer look & description)



What are the benefits of Kanban?

Some commonly observed benefits are:

- Bottlenecks become clearly visible in real-time. This leads people to collaborate to optimize the whole value chain rather than just their part.
- Provides a more gradual evolution path from waterfall to agile software development, thereby helping companies that previously have been unable or unwilling to try agile methods.
- Provides a way to do agile software development without necessarily having to use time-boxed fixed-commitment iterations such as Scrum sprints. Useful for situations where sprints don't make much sense, such as operations and support teams with a high rate of uncertainty and variability.
- Tends to naturally spread throughout the organization to other departments such as HR and sales, thereby increasing visibility of everything that is going on at the company.

Can I combine Kanban with my current process?

Yes. In fact, you should combine it. In Kanban the first step is to visualize your current process, just as it is, in order to see where the bottlenecks are. Then you introduce WIP limits and start a path of evolution that may or may not modify or replace your current process over time. See “Kanban & Scrum – making the most of both” (<https://dl.dropbox.com/u/1416421/crisp/web/Kanban-vs-Scrum.pdf>), where Henrik Kniberg (<http://crisp.se/henrik.kniberg>) and Mattias Skarin (<http://crisp.se/mattias.skarin>) illustrate how Kanban and Scrum relate to each other.

Where is Kanban used?

Our coaches at Crisp have helped several clients use Kanban to improve their process. In fact, a surprising number of our clients have found that Kanban is an extremely useful complement (or sometimes even a replacement) to other popular agile methods such as Scrum. Typical manager comment: "It really helps us visualize our projects and situation". There is also an increasing number of case studies available at www.limitedwipsociety.org (<http://www.limitedwipsociety.org>). Here are a few examples:

- Improving operations using Kanban (http://blog.crisp.se/mattiasskarin/files/slides/introducing_kanban_in_operations.pdf), Mattias Skarin, Developerdays 2009
- David Anderson's case study (<http://www.infoq.com/presentations/kanban-for-software>) – and why lead time is best metric
- David Joyce shows how a Scrum team improves by moving to Kanban (<http://leanandkanban.wordpress.com/2009/11/04/kanban-results-part-3-from-scrum-to-kanban/>) with Statistical process control data

Common misunderstandings about Kanban

- **Myth:** With Kanban you don't use iterations
- **Fact:** With Kanban iterations are optional. Do it only if you have a need for it in your context.
- **Myth:** With Kanban you don't estimate
- **Fact:** With Kanban estimation is optional. Do it only if you have a need for it in your context.
- **Myth:** Kanban is better than Scrum/XP/RUP/whatever
- **Fact:** Kanban is just a process tool, and there is no such thing as a universally good or bad tool. It all depends on your context. See this article for more info (<http://agile.dzone.com/articles/kanbans-not-better-scrum-its>).
- **Myth:** Kanban is a drop-in replacement to Scrum/XP/RUP/whatever
- **Fact:** Kanban is just about managing workflow. It hardly replaces anything. What it does do, however, is drive change. In Kanban you start with whatever process you have, visualize it, introduce WIP limits, and then evolve from there.

Upcoming Kanban courses & events

We offer training courses in Kanban and Lean software development.

- Upcoming Kanban training courses (<http://www.crisp.se/kurser/kanban>)
- Upcoming Lean training courses (<http://www.crisp.se/kurser/lean>)

Case examples

Marketing

- Kanban in inbound marketing (<http://kanbantool.com/use-cases/kanban-in-marketing/inbound-marketing>)
- Bringing kanban into marketing (<http://7oas7er.wordpress.com/2014/02/25/bringing-kanban-into-marketing/>)

Enterprise

- Enterprise Kanban (<http://www.crisp.se/file-uploads/enterprise-kanban-a-case-study-mattias-skarin.pdf>)(article by Mattias) – shows how Kanban can be used to improve the full value stream

Multi team projects

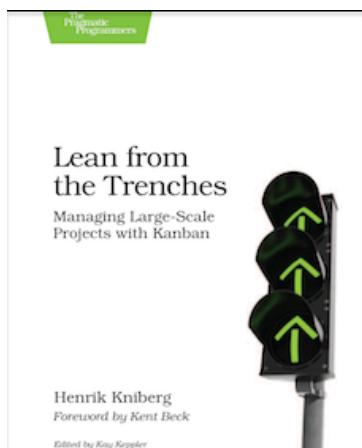
- Lean from the Trenches – Managing Large Scale Projects with Kanban (<http://pragprog.com/book/hklean/lean-from-the-trenches>) (book by Henrik) – shows advanced application of Kanban in a 60-person project

Operations

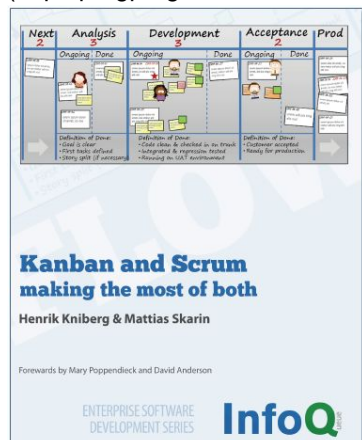
- Kanban & Scrum, making the most of both (<http://www.crisp.se/file-uploads/enterprise-kanban-a-case-study-mattias-skarin.pdf>) (book by Henrik & Mattias)

Further reading

- Kanban (http://www.amazon.com/Kanban-David-J-Anderson/dp/0984521402/ref=sr_1_1?ie=UTF8&qid=1293750801&sr=8-1)(book by David J Anderson)
- Kanban & Scrum, making the most of both (<http://www.crisp.se/file-uploads/enterprise-kanban-a-case-study-mattias-skarin.pdf>) (book by Henrik & Mattias)
- 10 kanban boards and their context (<http://blog.crisp.se/2011/12/05/mattiasskarin/10-kanban-boar?xt-version-1-2>) (article by Mattias)
- Converting a Scrum team to Kanban (http://blog.crisp.se/mattiasskarin/files/pdf/converting_a_scrum_team_to_kanban.pdf) (article by Mattias)
- www.limitedwipsociety.org (<http://www.limitedwipsociety.org/>) – main Kanban resource site
- One day in Kanban land (<http://blog.crisp.se/henrikkniberg/2009/06/26/1246053060000.html>) (comic strip by Henrik)
- Kanban kick-start example (<https://dl.dropbox.com/u/1416421/crisp/web/kanban-example.pdf>) (template by Henrik)
- How can support and operations be Agile (http://blog.crisp.se/mattiasskarin/files/agileforsupport/kanban_for_support_and_operations.pdf) (slides by Mattias)
- Mattias' blog entries on Kanban and more (<http://blog.crisp.se/author/mattiasskarin>)
- Henrik's blog entries on Kanban and more (<http://blog.crisp.se/author/henrikkniberg>)
- Queue utilization is a leading indicator (<http://leansoftwareengineering.com/2008/06/12/queue-utilization-is-a-leading-indicator/>) (Corey Ladas)



(<http://pragprog.com/book/hklean/lean-from-the-trenches>)



(<http://www.infoq.com/minibooks/kanban-scrum-minibook>)

Våra konsulter (<https://www.crisp.se/konsulter>)

Agila Coacher (<https://www.crisp.se/konsulter/coacher>)

Våra kurser (<https://www.crisp.se/kurser>)

Gratis material och guider (<https://www.crisp.se/gratis-material-och-guider>)

Böcker och produkter (<https://www.crisp.se/bocker-och-produkter>)

Aktuellt



(<https://www.crisp.se/aktuellt/hitta-latt-den-kurs-som-passar-din-situation>)

Hitta lätt den kurs som passar din situation (<https://www.crisp.se/aktuellt/hitta-latt-den-kurs-som-passar-din-situation>)

Nöjd Crispare Index i tidningen Chef (<https://www.crisp.se/aktuellt/nojd-crispare-index-i-tidningen-chef>)

www.crisp.se är nu responsiv (<https://www.crisp.se/aktuellt/www-crisp-se-ar-nu-responsiv>)

Nyhetsbrev

Om du är intresserad av att få uppdateringar om utvalda kurser och populära gratisevent så är du välkommen att prenumerera på vårt nyhetsbrev.

Vi gör nyhetsutskick ca 1 - 3 gånger i kvartalet.

Företag

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Prenumerera på nyhetsbrevet



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(<https://www.google.se/maps/place/Crisp+AB/@59.336636,18.062177,17z/data=!3m1!4b1!4m2!3m1!1s0x0:0xc8414e6f1746bca7>)

- +46 8 556 950 15 (tel:+46855695015) - info@crisp.se (<mailto:info@crisp.se>)

Kanban is a system to control the logistical chain from a production point of view, and is an inventory control system. **Kanban** was developed by Taiichi Ohno, an industrial engineer at Toyota, as a system to improve and maintain a high level of production. **Kanban** is one method to achieve JIT.

Kanban - Wikipedia, the free encyclopedia

<https://en.wikipedia.org/wiki/Kanban> Wikipedia ▾



More about Kanban

Team Kanban Board

QUICK FILTERS: [Critical partners](#) [Only my partners](#) [Recently updated](#)

1 To do

TIS-28

Research options to travel to Pluto

4 In progress

TIS-25

Engage Jupiter Express for travel

TIS-25

Add Deimos Tours as a travel partner

TIS-20

Engage Saturn Lines for group tours

TIS-24

Sign Contract for SunSpot Tours

3 Code review Max 2

TIS-27

Engage Saturn Resort as PTP

TIS-27

Engage Speedy SpaceCraft

TIS-26

Reach out to the Red Titan Hotel

1 Done

TIS-23

Engage JetShuttle SpaceWays for travel

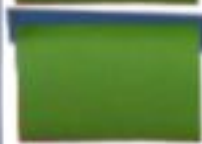
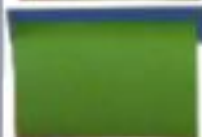
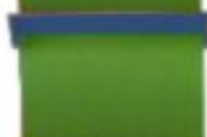
[Release](#)

EXPEDITE →



GOALS STORY QUEUE ELABORATION & ACCEPTANCE DEVELOPMENT TEST DEPLOYMENT DONE!

YOUR WAIT
TIME FROM HERE
IS ABOUT
14 DAYS



YOUR WAIT
TIME FROM HERE
IS ABOUT
18 DAYS



5

3

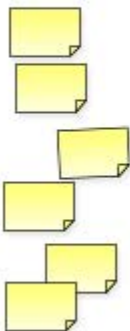
5

3

1

6

Pending

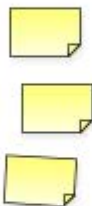


3

Analysis

Doing

Done

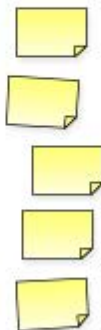


5

Development

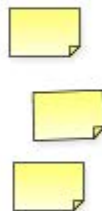
Doing

Done



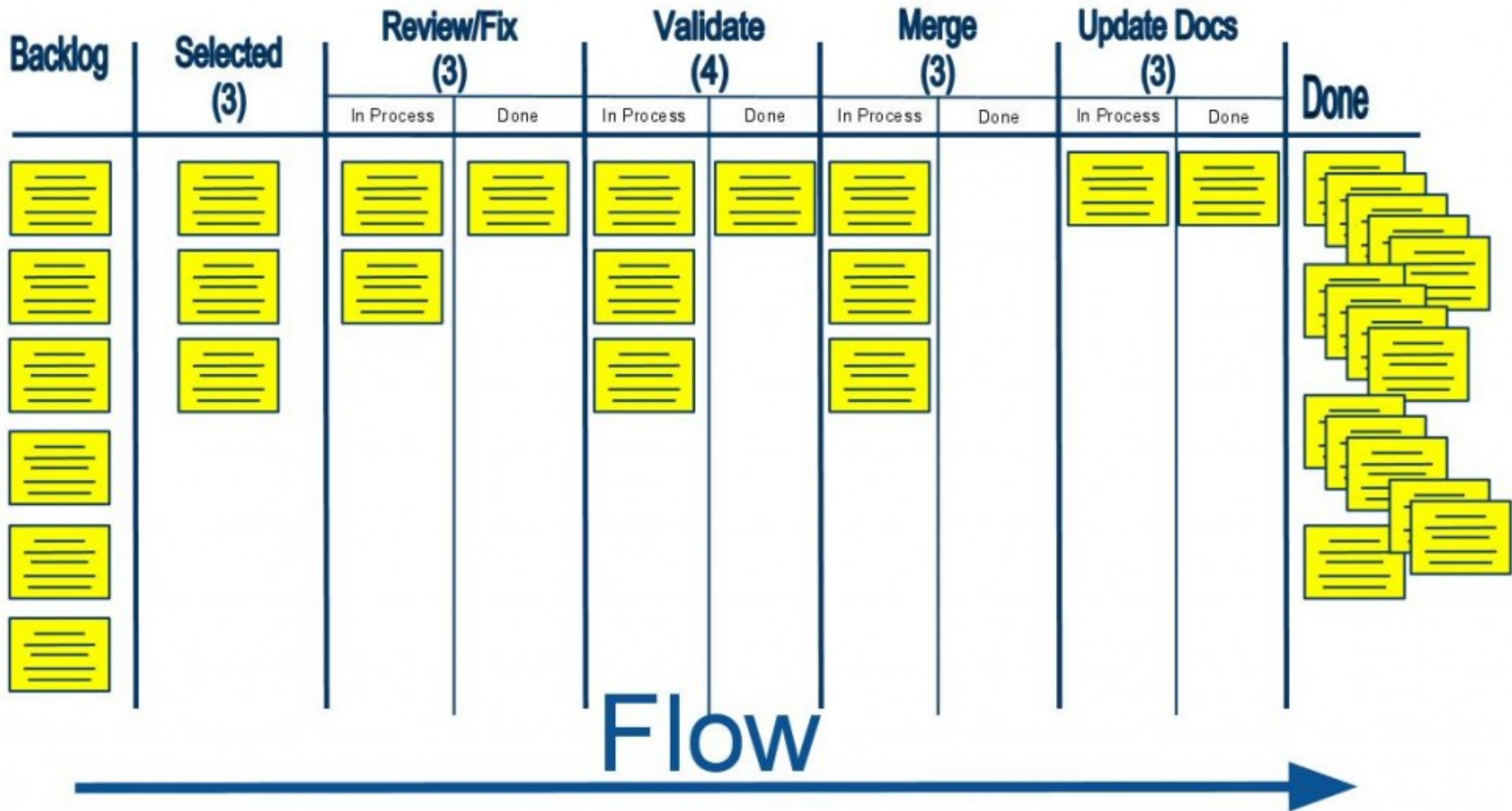
3

Test



5

Deploy



TO DO



DOING



DONE



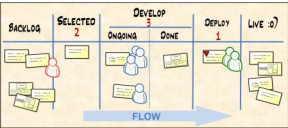
Ticket ID #42

The week view of the new
calendar feature

3

Chris

Alex



Next 2

Analysis 3

Development 3

Acceptance 2

Prod

Ongoing

Done

Ongoing

Done

Ongoing

Done

Task 1: User login, add email, add password, add phone, add address

Task 2: User login, add email, add password, add phone, add address

Task 3: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 2: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 2: User login, add email, add password, add phone, add address

Task 3: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 2: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 1: User login, add email, add password, add phone, add address

Task 2: User login, add email, add password, add phone, add address

Task 3: User login, add email, add password, add phone, add address

Definition of Done:

- Goal is clear
- First tasks defined
- Story split (if necessary)

Definition of Done:

- Code clean & checked in on trunk
- Integrated & regression tested
- Running on UAT environment

Definition of Done:

- Customer accepted
- Ready for production



To Do

Doing

Done

USE
KANBAN

TRY
KANBAN
TOOL

LEARN
ABOUT
KANBAN

GET SOME
STICKY
NOTES!

GET A
WHITE -
BOARD

Kanban Boards step-by-step v0.3 - alpha



Normal Flow & WIP



Urgencies



Swarming



People



Sprint (a proposal)



Linked Kanban



Support team



Personal



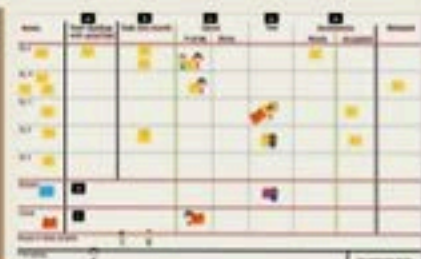
Time driven



Cross-functional teams



Scatter merge



Program



CFD