#YesWeKanban

THE OFFICIAL GUIDE TO THE KANBAN METHOD

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The Kanban Method

This guide is targeted at people new to Kanban and interested in learning about the basics of the method. That is why we included an introductory metaphor (KanBahn) to help people connect to the concept. Our hope is that this guide provides an easy entry into the vast Kanban body of knowledge.

For alumni of Kanban University classes for instance who want to review certain aspects, we recommend the "Essential Kanban Condensed" e-book as a reference.

What is Kanban?

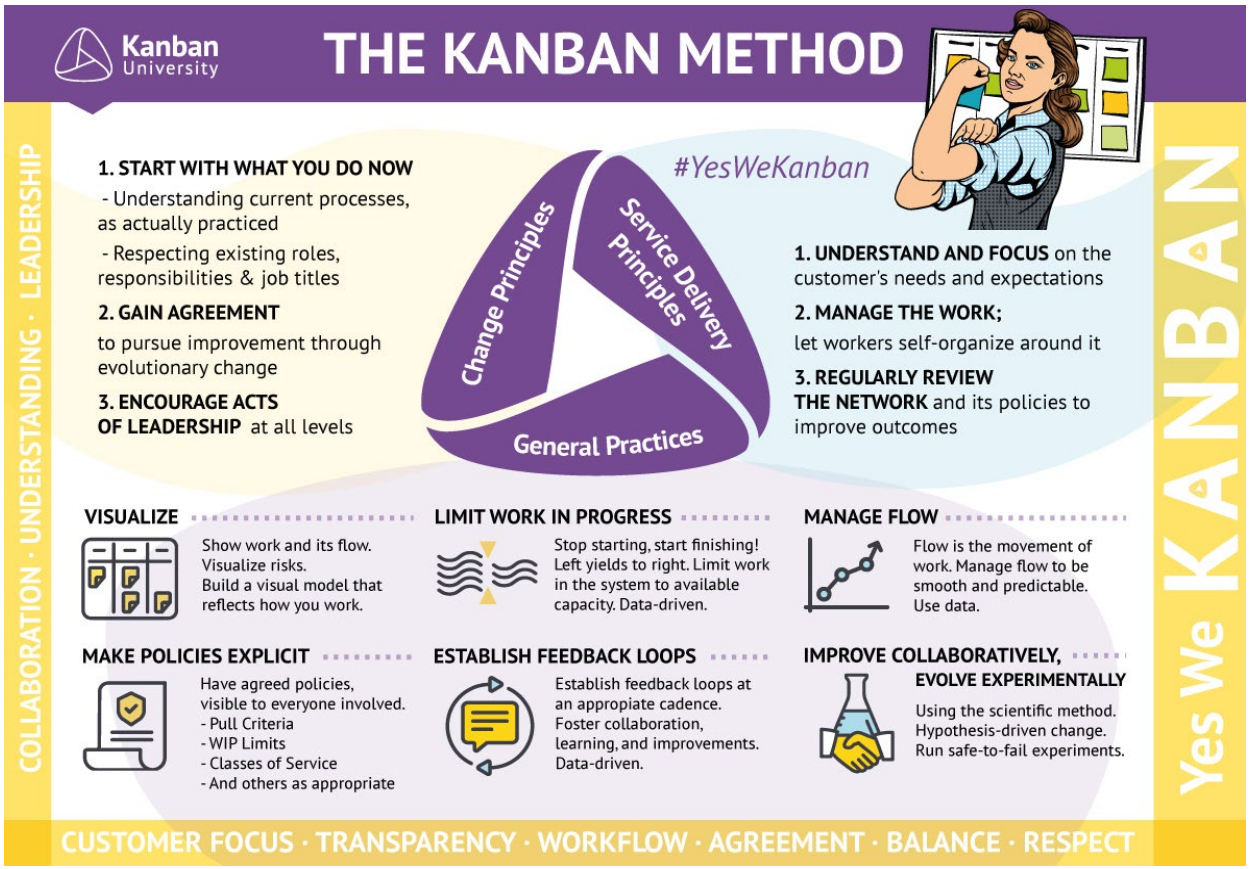
Maybe the simplest way to put it is: With Kanban, you can manage work. It is a method to manage all types of professional services, also referred to as knowledge work.

Using the Kanban method means applying a holistic way of thinking about your services with a focus on improving them from your customers' perspective.

With the Kanban Method, you visualize invisible knowledge work and how it moves through a workflow. This helps to effectively operate your business, including understanding and managing risks in delivering your services to the customers. With Kanban, you and your business will develop an adaptive capability over time to respond better and faster to changes in your customers' needs and expectations or within your business environment.

Kanban is widely known for usage within teams, to relieve overburdening and to (re-)gain control over the work done by the team. While this usually brings quick benefits, applying the Kanban Method at a greater scale, e.g. for a line of service usually encompassing the work of multiple teams or different parts of organizations, brings even greater opportunities. Used with a service focus in mind, Kanban is an effective organizational development tool.

Kanban University (www.kanban.university) is "Home" of the method and the global community of Kanban trainers, coaches and consultants who continue to evolve the method and develop its related body of knowledge.



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Method, Methodology, or Framework?

Kanban is often confused with a methodology or framework. In software engineering a methodology is a process definition approach to software development and project management (a bit of a misnomer, as "methodology" should mean "the study of methods"). Methodologies contain prescriptive, defined workflows and processes, including roles, and responsibilities. This means that they are usually specific to a domain, such as software development.

A process framework on the other hand is an incomplete methodology – a set of scaffolding that is intended to have broader applicability but requires customization for each context in order to fill in the missing gaps.

Kanban is not a methodology nor a process framework. Rather, it is a management method or approach that should be applied to an existing process or way of working. There is never a question of using Kanban versus a given methodology or framework. Rather, it is always adding Kanban using an existing methodology, framework, or way of working. Kanban is intended to help you manage work better and to improve service delivery to the point where you consistently meet customer expectations. Kanban is a means to improve what and how you already do things. It is not a replacement for what you already do.

Origins

The Kanban Method as described here is based on Kanban: Successful Evolutionary Change for Your Technology Business, by David J Anderson, 2010. The motivation to create the method was mainly to find a way to manage and improve professional service businesses as well as a way to provide a humane change method.

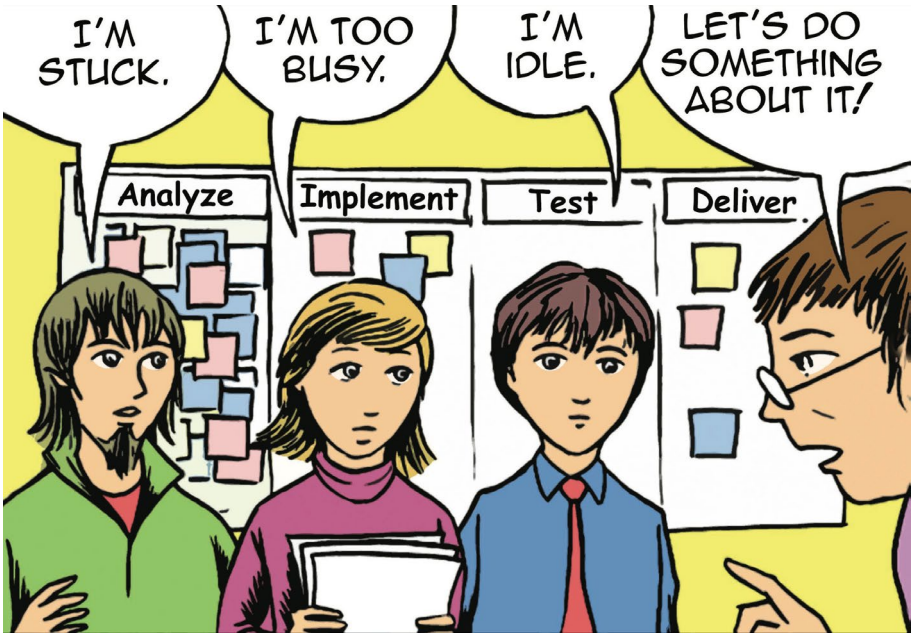
The roots of the method are found in Lean Manufacturing. However, Kanban is meant to be used to manage knowledge work resulting in intangible and virtual goods and services. When compared to manufacturing, the Kanban Method views inventory as usually intangible or invisible and has much lower direct costs attached, variability in the delivery of work is accepted as inherent, the workflow is usually less strict, and the focus on waste reduction is of lower concern. Improving the value and flow of goods and services delivered are the initial focus when using the Kanban Method.

In many aspects, Kanban is strongly founded on lean: The focus on the flow of work, limiting work in progress to establish pull systems, focus on the optimization of the system as a whole rather than managing an individuals' performance, making decisions based on data, and continually improving in an evolutionary way.

Areas of Application

Kanban is a rather abstract "method without methodology" and has a wide area of possible applications.

It is important to understand that the Kanban Method is applied with its principles and practices on top of an existing flow of work and way of working. The work can be of very different kinds. After being introduced in 2010, there were several examples of Kanban being applied to services in the IT sector. Today, there is an ever increasing amount of examples of Kanban being utilized by marketing agencies, human resources, media and design services, customer support, product development, and education.



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Principles and Practices of the Kanban Method

When using Kanban, the scope of application (e.g. single team, multiple teams, departments, divisions, etc.) can influence the way the method's principles and practices are applied.

If you have a look at a basic scope within a team for instance, you might find a relatively simple Kanban board with maybe 5 columns indicating the workflow, a few simple metrics and diagrams, a daily held coordination meeting and regular reviews of the team's work and performance.

Now imagine a whole internal services department within an enterprise, which is managed by a set of Kanban boards relating to each other, placed at different levels of granularity, covering different workflows. The amount of work in progress is limited at different levels.

Both instances are proper usage of the Kanban method. There is no "right or wrong" in Kanban, rather more or less appropriate adoption of practices given the business context and cultural environment.

The following two sections describe the general Kanban principles and practices.

Kanban Principles

Change Management Principles

These Change Management Principles are common to all Kanban implementations:

- Start with what you do now
- Agree to pursue improvement through evolutionary change
- Encourage acts of leadership at all levels

Kanban is not a big bang transformation going from a current state to some future state. We know from history that those rarely work. Instead, Kanban uses an evolutionary change approach, building on the way of working already in place, seeking to improve it using many forms of feedback and collaboration. The Kanban Method engenders evolutionary change through insights gained by the people working with the Kanban board and taking acts of leadership to continuously improve their way of working. These acts of leadership may not be what are thought of as traditional leadership. They may be small observations and suggestions for improvement by individuals without organizational leadership roles.

Service Delivery Principles

Kanban encourages you to take a service-oriented approach to understanding your organization and how work flows through it. This service-oriented organizational paradigm is based on the idea that your organization is an organic entity consisting of a network of services, each of them living and breathing, and evolving. Customer requests flow through this network of services. If we are to improve service delivery, improvements should be guided by a set of principles. These principles may not be utilized early on by organizations as they may not have developed or evolved a service-oriented or customer service mindset as part of their culture.

The service-oriented principles are:

- Understand and focus on customer needs and expectations
- Manage the work; let people self-organize around it
- Regularly review the network of services and its policies in order to improve outcomes



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Kanban General Practices

As mentioned earlier, the breadth and depth of Kanban practices applied varies greatly.

In this section, the six general Kanban practices are described. Later in the guide we go into more details on some of the core specific practices that fall within these 6 general practices. Please refer to the Kanban Maturity Model (KMM) for more details on specific implementation by maturity level.



Visualize

A good visualization is the key to effective collaboration and to identify improvement opportunities. Many times, work in the organization is hidden. Visualizing that work and the flow of that work greatly improves transparency. The human sense of vision is very old from an evolutionary point of view. It allows us to absorb and process a great deal of information in a short time. In addition, visualization supports cooperation, as everyone involved literally has the same picture. More details on Visualization will be presented in the section on Kanban Boards.

Limit Work in Progress (WIP)

WIP (Work in Progress) states the number of work items in progress at a certain time. Through Kanban we have discovered that effective systems focus more on flow of work and less on worker utilization. When resources are fully utilized there is no slack in the system and the result is very poor flow, just as in rush hour on the freeway. In knowledge work we also have the issue of context switching that can drastically reduce the effectiveness of workers.

In Kanban, we limit the WIP to balance utilization and still ensure the flow of work. Later we will describe WIP limits and how they are used in a "pull system".

Manage Flow

The goal of managing the flow of work is to complete work as smoothly and predictably as possible, while maintaining a sustainable pace. As mentioned before, limiting WIP is one of the key ways that helps us ensure smooth and predictable flow. The monitoring or measuring of the workflow results in important information that is very useful for managing expectations with customers, for forecasting, and for improvements. This will be discussed in the section on Core Kanban Metrics.

Make Policies Explicit

Every day, countless decisions are made about the organization of work, either by individuals or between groups of people.

Imagine a new employee starting in your area. Ideally, she will quickly understand how work is organized through explicit policies. These include:

- Policies such as replenishing the board (when, how much, by whom)
- Definition of when a work activity is completed, and the work item can move on ("pull criteria")
- WIP Limits
- Policies for handling work items of different classes of service
- Meeting times and content
- Other principles and collaboration agreements

All of these policies should be agreed to jointly between all parties involved including customers, stakeholders, and employees responsible for work on the board. The policies should be placed in a clearly noticeable area, preferably right next to the board. At team level, a team agreement is a good way to introduce policies. Like all other building blocks of the system, it is necessary to check and adapt these regularly.

Please note that policies are not like work instructions freeing people from the burden to make meaningful decisions. Rather, policies should enable self-organization within the group of people running a Kanban system.

Policies should be:

- sparse
- simple
- well-defined
- visible
- always applied
- readily changeable by those providing the service

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Implement Feedback Loops

Feedback loops are required for a coordinated delivery and for improving the delivery of your service. A functioning set of feedback loops appropriate for the given context strengthens the learning capabilities of the organization and its evolution by means of managed experiments.

Some commonly used means for feedback loops in Kanban systems are the board, metrics, and a set of regular meetings and reviews which are referred to as cadences.

Improve Collaboratively, Evolve Experimentally

Back to the Change Management Principles, in the Kanban Method we "Start with what you do now" and "Agree to pursue improvement through evolutionary change." Kanban is a method for continuous change, and we make those changes collaboratively using designed experiments based on models and the scientific method. This is where feedback and metrics are so important to guide us in the evolutionary path. We design safe-to-fail experiments so that if our hypothesis is correct and the experiment gives good results, we keep the change, but if the results are not positive, we can easily roll back to the prior state.

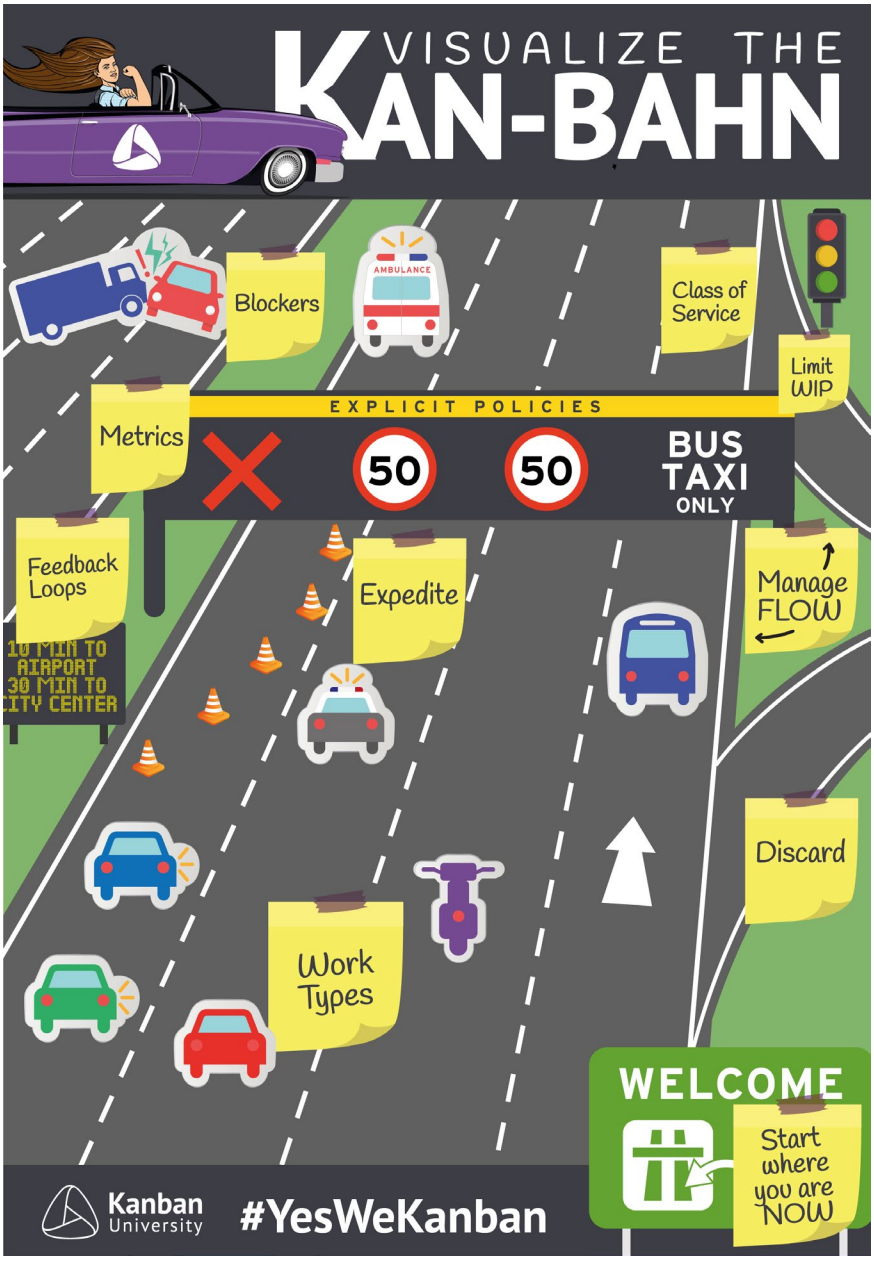


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“Kan-Bahn” – An Introductory Metaphor

The basic concepts of Kanban will be introduced here by means of a metaphor. Before we start, please consider George E.P. Box’s famous quote “All models are approximations. Essentially, all models are wrong, but some are useful. However, the approximate nature of the model must always be borne in mind”. An international group of Kanban coaches and trainers created this metaphor in 2016 at a Kanban Leadership Retreat in Barcelona.

It is based on an “Autobahn”, a German form of highway, hence the name. Our board (or system) is represented by a highway. Traffic (the work) flows — divided into packages — in the form of different vehicles through our system, a defined section of the route. Using this metaphor, key Kanban terms (*in bold italics*) will be introduced.



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Utilization vs. Throughput

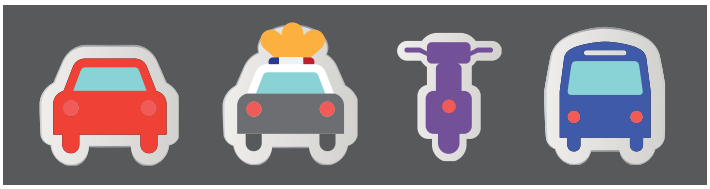
When traffic jams are on the motorway, the roads (resources or ***capacity***) of our system are fully utilized (***utilization***), but very little is moving: Very few vehicles (***work items***) per unit of time pass through the system (***throughput***), all spend a very long time (***lead time***) in this section of the route. Consequently, we are late (***delays occur***), and we miss our appointments (***promises to deliver*** might be broken).

Are you really looking forward to high utilization on the road when driving? Unfortunately, this form of optimization is still a widespread management paradigm.

With Kanban, we optimize differently. As many vehicles (***work items***) as possible should be able to pass through our system in a smooth manner, as quickly and predictably as possible. Operating well below full capacity (slack) is desired here and conducive to the flow.

Types of Work

Different types of vehicles from motorcycles to cars, minibuses, trucks and buses pass through the section of the route. The Kanban equivalent are different types of work (***work item types***). These have different characteristics – they vary in their purpose, size, speed, and passenger or cargo capacity.



Classes of Service

Different types of vehicles such as police cars, fire trucks or ambulance cars may pass through the system preferentially. This is an example for treating defined items in a differentiated manner. In Kanban, this concept is called "Class of Service".

The example described above could be mapped to a service class typically called "expedite". For this purpose, there are agreed rules and criteria for vehicles known to all drivers that are allowed to use this service class: vehicles must be clearly recognizable (e.g., by blue light and certain paintwork) and may pass through the system even if the WIP limit is fully exhausted (motorway congested), while others have to form a rescue lane. This will lead to the "expedite" vehicles being able to pass quicker, while the travel for the other cars will take longer.

Another example for the use of Classes of Service are restricted traffic lanes that are exclusively reserved to e.g., only buses and taxis, electric cars or vehicles with two or more occupants ("carpool lanes", also known as High Occupancy Vehicle or "HOV" lanes in the United States).

Managing the Flow of Work

Depending on the location and time, the volume of traffic varies, i.e. the total number of vehicles (***work items***) and the distribution of vehicle types (***work types***). In metropolitan regions there will usually be more personal or private traffic with extremely high volumes during peak times (e.g. rush hour). Conversely, on major transit routes between metropolitan regions, there will be less extreme peaks in volume consumed mostly by shipping trucks.

Our system is being designed to cope with variability of traffic volume. In doing so, we might control the inflow of vehicles (work items), the available capacities (e.g., number of lanes and their quality of expansion), and the speed limit.

Visualize

Imagine working in a traffic control center. Due to the complexity of the system and the variability in the behavior of each vehicle and unpredictable events, each day will be different.



In the picture above, a control board (***kanban board***) is used by a traffic dispatcher to see at a glance which sections of the route are busy, where there are construction sites, and where there have been accidents or breakdowns causing congestion (***bottlenecks***). This presentation allows decisions to be made more quickly and collaboratively.

Limit Parallel Work

In urban centers, traffic lights are often found at motorway entrances (on-ramps). Ramp metering or signaling, as it is called, controls (see Ramp Metering: A Proven, Cost-Effective Operational Strategy) the rate at which vehicles can enter the system based on traffic volume and speed in order to avoid overloading.

The Kanban term for this is "Limiting WIP", where WIP stands for Work in Progress.

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Pull

When you are driving on the highway, you can see if there is space in front of you. You consider this as a signal to continue, otherwise you must slow down or even stop. In Kanban systems, we call these signals of available capacity ***pull signals***. For pull signals to work, you will need to define your WIP limits as an expression of maximum capacity.

The ***pull principle*** applied to a motorway might look like this: The ***system***, our section of the motorway where we are driving our car, would be divided into sectors (e.g., 500m or ~500yds). If there is enough space for your vehicle plus a safety distance on the following sector (i.e., fewer vehicles there than the maximum capacity = WIP limit), something will signal your vehicle (***work item***) to proceed to the following sector, otherwise you will wait at the end of the current sector until capacity becomes available (through other vehicles leaving the sector).

Well, every metaphor has its limits. This signal will populate further up the road, possibly preventing more cars from entering the motorway.

Flow of Work

In the Kanban context, flow refers to the movement of work through a system. Traffic flow is actively controlled on particularly busy sections of the motorway. This requires visualization and measurement data logging and evaluation. This data is collected by sensors for traffic volume and speed, weather conditions etc. In addition to controlling the inflow of vehicles, there are electronic scoreboards that reduce or throttle the speed depending on the traffic situation in order to enable all road users to pass as quickly and evenly as possible.

Over time, a lot can be learned about patterns in the flow by evaluating the historic data gathered. It can be used to further optimize the system, informing authorities where changes would have the biggest effects.

Blockers

Reported accidents or road damage (***blockers***) obstruct the flow and are displayed in the control center and removed as soon as possible. The system is regularly examined for accident hotspots in order to enable future improvements.



Explicit Policies

The signs and signaling systems along the motorway make the rules of traffic (which are known to all road users) visible and are usually followed.

Feedback Loops

On particularly important roads, such as access roads to airports or city centers, there are information boards indicating the estimated time to travel to certain destinations. E.g., "10 Min to Airport". This data is based on historical data as well as current traffic volume.

Map providers like Google Maps use a combination of real-time data and historic patterns to both navigate you best on your journey (***manage delivery***), and to help you plan trips ahead by forecasts.



Improve the System

A motorway system also needs to be continuously developed and improved. Traffic flow measures are optimized, existing routes need to be serviced, potholes repaired, bottlenecks and accident hotspots defused. New lanes may be built (***capacity*** expanded) in particularly busy sections, which is very costly and time-consuming. All these improvement measures are informed by knowledge of the system, especially supported by visualization and collecting data, and regularly checked for their effectiveness after they are introduced.

Options, Commitment Point, Lead Time

A roundabout at the motorway entrance for instance allows you to enter the motorway. Only when you take the turn to the on-ramp will you exercise this option. You commit to traveling on the motorway (discarding other options). If you already see a long traffic jam from a distance, you can also discard the motorway option and, for example, choose a different route or postpone the trip. So how do you build your own Kanban system? Let's learn about some of the Kanban Method's specific practices.

Once you decided to enter the motorway, you are "in the system" and the lead time clock starts ticking. Depending on the available capacity, you can now pass through the individual parts of the highway section. Arriving at the end, the lead time ends, indicating how long it took you from the entrance to the exit point.

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Specific Practices

So how do you build your own Kanban system? Let's learn about some of the Kanban Method's specific practices.

STATIK

A question commonly asked by practitioners is "If every board and Kanban system is unique, how can I design my own system?"

The Systems Thinking Approach To Introducing Kanban (STATIK) is a repeatable and humane way to get started with Kanban. It has been applied numerous times in practice.

The STATIK approach should be applied to each service. It will result in a full Kanban system design. Throughout the process, systems thinking should be applied. The (future) system is always considered as a whole, with the goal of improving the flow of value to customers.

The illustration below (Figure 1) summarizes the 6 basic steps in the STATIK approach, which are usually applied in an iterative way. Subsequent steps can uncover new information, and it might make sense to repeat earlier steps.

STATIK workshops tend to iteratively explore the correct system design. STATIK is not intended as a one-pass, sequential process, but rather it is intended to function as a feedback loop that informs design and redesign activities.

In practice, this process usually takes between 4 hours and 4 days. It is important to understand that it should be done with at least a representative group of the people involved. While everyone will have a picture of how the work is done in mind, it rarely maps between people. The STATIK approach will reconcile these views into a shared view. As a rule of thumb, it should not be done in isolation e.g., by the Project Manager, Team Lead, or a Coach or Consultant.

1. **Identify sources of dissatisfaction** – What are the people involved in service delivery dissatisfied with? What are customers dissatisfied with? All these sources of dissatisfaction provide motivation for change which is key for a successful Kanban initiative.
2. **Analyze demand** – What do customers request, through which channels? What are types of work and patterns in demand? This information is key to develop the full picture of the work that arrives at the system. Remember, manage the work not workers!
3. **Analyze system capabilities** – What are the capabilities of the system with regard to how much of the customer demand is being delivered, of what type, and how fast and predictable? This step typically requires historical data.
4. **Model the workflow** – Which are the activities that each of the identified work item types go through? They might be sequential, parallel, or in no particular order. Later, these will be the basis for defining the columns on the Kanban board.
5. **Identify classes of service** – How do items enter and get treated in the system? See the Classes of Services definition.
6. **Design the Kanban system** – Based on all the insights gained in the prior steps, the Kanban system is then designed. A Kanban system naturally consists of a board and tickets, plus other important elements such as metrics, cadences, and policies.



Figure 1

Further details about STATIK are taught in the Kanban University System Design courses.

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Kanban Boards

Kanban boards are the most common means of visualizing a Kanban system. Common to all boards is pulling work from left to right through the board: on the left, new work items enter the board. When they exit on the right, value is delivered to customers.

In a Kanban system, there is at least one clear commitment and delivery point as well as a representation of the permitted amount of work (Work in progress, WIP).

Work items can be of different types and sizes, from tasks to requirements, types of artifacts, (groups of) product features and topics to projects or product packages on higher level boards. Examples are campaigns in agencies, user stories in software development teams, job positions in HR, or products for a product development group.

Work items are typically displayed on individual (paper) notes, which are usually called cards or tickets.

The series of activities these work items go through are referred to as workflow. Kanban is based on the "Start where you are now" approach, so, the actual workflow (not a wishful future image) is being modeled on the Kanban board.

The individual steps in the workflow and buffers are shown in columns. Lanes are often used for different work types, projects, etc. to distribute capacity.

Imagine the work of an in-house training service provider in a larger company. Ideas or requirements for new courses are collected first. After a selection and refinement process, new courses are developed, piloted, then finalized and are then ready for use. The image below (Figure 2) shows a possible, simplified board layout:

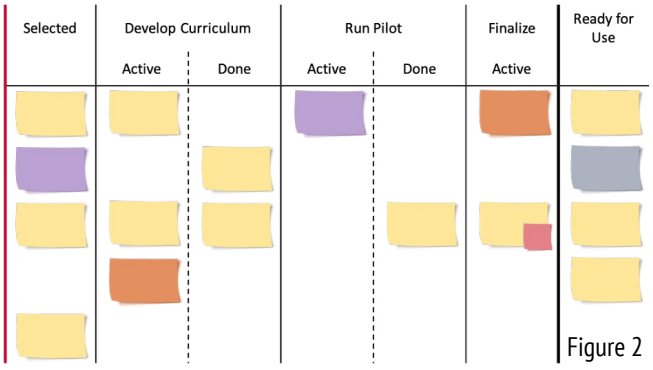


Figure 2

The workflow is modeled on the board. Different colored notes can be used, for example, to represent different types of courses (e.g., online vs. classroom training), or different groups of clients.

The flow of work and its risks should be realistically shown in their true current state rather than a wishful image of the future at all times. Your Kanban board should reflect your specific workflow, which is usually more than columns labeled as To Do, Doing, Done. The possibilities vary greatly. Each Kanban system and Kanban board are unique.

WIP Limits and Pull

The so-called WIP limit, i.e., the maximum number of work items allowed at a time, can be defined per work state(s), per person, per lane, per type of work, for a whole Kanban system, etc.

WIP limits are typically represented by a number in a circle, above the respective columns:

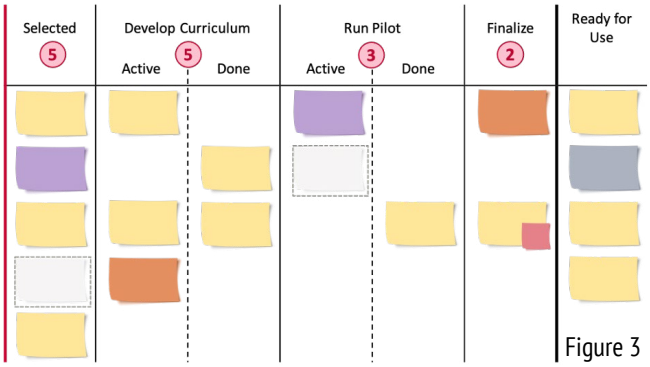


Figure 3

In Figure 3, a maximum of three courses may be piloted at the same time. Furthermore, the design of the system is such that both Active and Done columns are limited by a total WIP limit. Currently, there is a purple item in the Active column, a beige item in the Done column and there is capacity for another course, indicated by the grey dashed note (slot).

Limiting the work that is allowed to enter the system is an important key to reducing delay and context switching which may result in poor timeliness, quality, and potentially waste. The aim is to create a balance between demand and capability over time.

Limiting the work that is allowed to enter the system also creates a continuous flow of work through the "pull principle" in which drawing or "pulling" work only happens if there is capacity. A virtual pull signal is generated when the WIP limit is not fully utilized. While work on the board moves to the right, pull signals move to the left, further upstream (Figure 4).

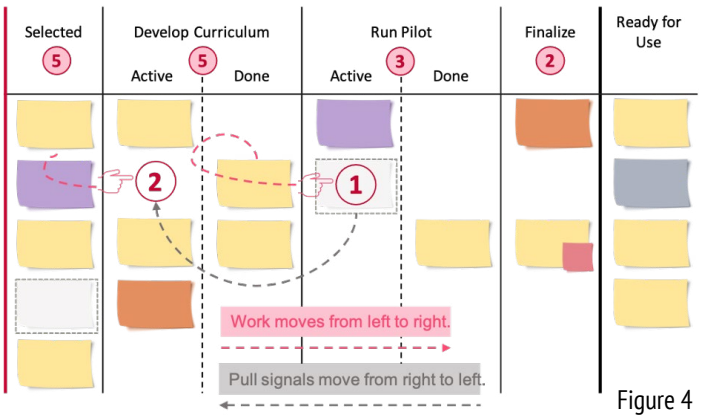


Figure 4

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The "pull principle" is an important distinguishing point from traditional project management, where work items are scheduled based on deterministic planning (push). In pull systems, completed work is regarded as more valuable than starting new work. This is often a cultural change. "Stop starting, start finishing" is a good mantra to remember for starters!

WIP limits are one specific example of a policy in Kanban. For more information, please refer to the "Make Policies Explicit" section under Kanban General Practices of this guide. They need to be agreed to by everyone actively involved. WIP limits serve as an enabling constraint, which gives focus and develops behaviors such as collaboration and finishing started items with high quality. WIP limits are key to establishing a pull system.

Core Kanban Metrics

There are a number of basic metrics in Kanban:

- Lead time is the time it takes for a single work item to pass through the system from the start (commitment point) to completion
- Delivery rate is the number of completed work items per unit of time, such as features per week, training classes per months, or new hires per month
- WIP (work in progress) is the amount of work items in the system (or a defined part of it) at a certain point in time

These core metrics are used in various graphical representations to understand system behavior and identify opportunities for improvement.

Figure 5 represents a run chart. The lead times of completed work items are plotted sequentially on a timeline. This is useful to observe lead time trends:

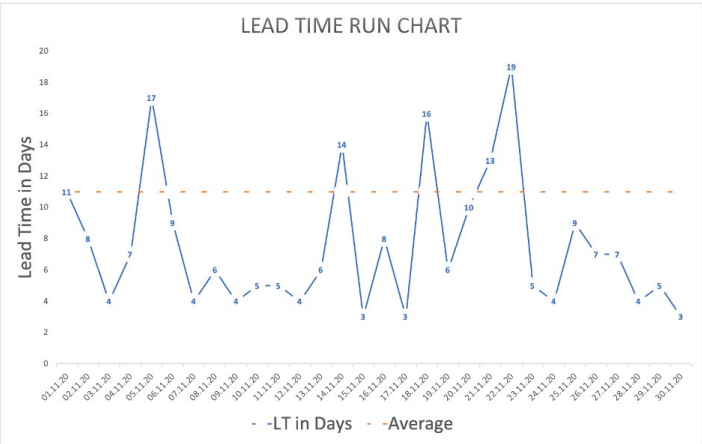


Figure 5

Figure 6 shows the distribution of lead times:

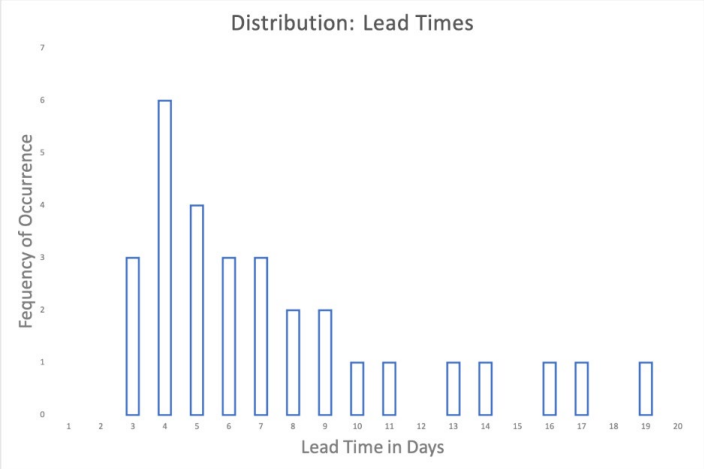


Figure 6

This chart depicts the range of observed lead times (min and max) and their frequency of occurrence (how often). The purpose of managing flow would be to optimize this distribution: by narrowing down the range as much as possible (predictability) and shifting it to the left (timeliness).

Figure 7 represents a cumulative flow diagram (CFD). The CFD contains useful information regarding the flow of work across multiple activities. The colored areas in the diagram represent the number of work items within a particular activity in the workflow and how these work items move across all activities, from top to bottom, over time until done.

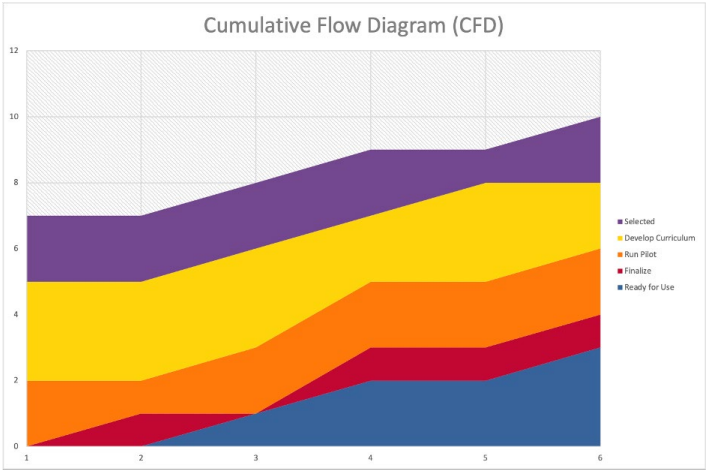


Figure 7

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Kanban Cadences

While in early Kanban implementations feedback loops might be almost completely lacking, with growing maturity, feedback loops evolve, which in turn advances maturity. We encourage you to build up your cadences gradually.

Please note that like all elements of a Kanban implementation, the cadences can and should be set up to fit within the given organizational context. In practical terms, this means:

- Identify existing meetings and reviews that already serve a similar purpose and continually evolve them
- Keep the existing names or use the standard cadence naming or come up with something else. It is the purpose that matters
- Pick the frequency and duration based on your context. In many cases, having more frequent but shorter meetings over time increases agility

As a side effect of many Kanban initiatives, we observe better focused, structured and tightly managed regular meetings with fewer attendees.

Example: Figure 8 Cadences at team level

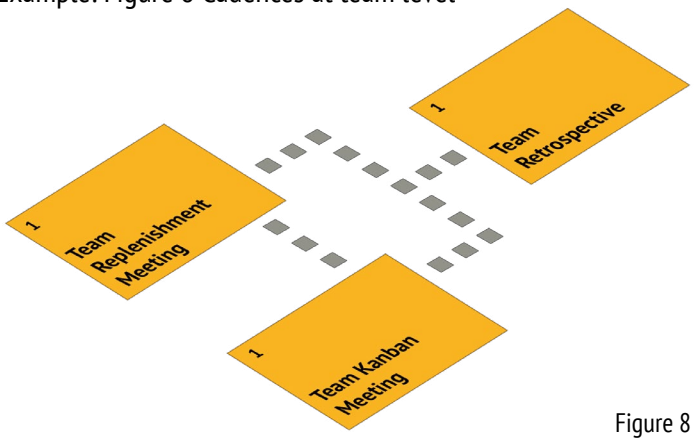


Figure 8

Example: Figure 9 Service-oriented Cadence

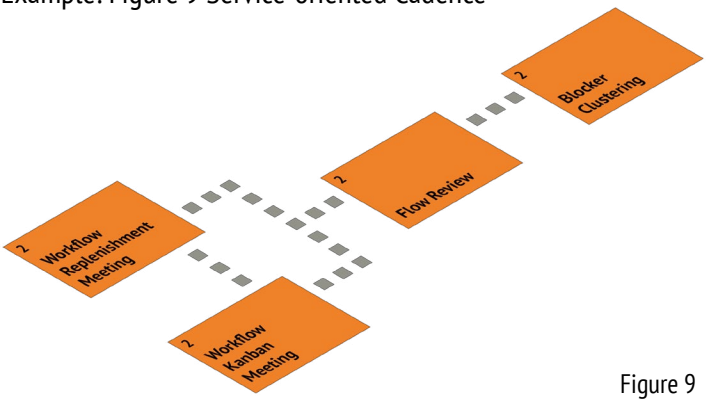


Figure 9

Cadence	Example frequency	Purpose
Team Kanban Meeting	Daily	To observe and track the status and flow of work (not the workers). How can we deliver the work items in the system quickly? Has capacity become available? What should we pull next?
Team Retrospective	Biweekly or Monthly	Reflect on how the team manages their work and how they can improve.
Internal Team Replenishment Meeting	Weekly or as needed	Select items from the pool of work to do next.

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Kanban University

About Kanban University

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, Accredited Kanban Consultants, 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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