

Create and Use a Value Stream Map

Realism in the footnotes

Abstract

This is an in-depth step-by-step instruction to create and use a Value Stream Map to improve processes with measurable results.

There are many nuances to doing this kind of effort well. The value of this article comes from both (1) the body that describes all the steps necessary to complete the effort, and (2) the footnotes that includes tips, tricks, and considerations so that you may succeed in this effort with the benefit of years of training and experience.

Jonathan DeLashmit
www.linkedin.com/in/Jonathan-DeLashmit

Introduction

This is a step-by-step instruction for how to (1) facilitate a Value Stream Map meeting, (2) facilitate a Value-Add Analysis meeting, (3) Facilitate Root Cause Analysis/Solutions Meeting, and (4) implement changes. Please take the time to read the entire article and all the footnotes¹.

By following these instructions, you will be able to measurably improve a process thereby impacting cost, quality, and/or efficiency in a sustainable way.²

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¹ Footnotes! This is where you'll find the real information! I will tell you what's hard, how to recognize who is going to give you problems.

² Will you really get these results? The first time you might, with practice you definitely will. I have identified millions of dollars in savings with this process; but I have A LOT of experience. Seriously, if you want help, contact me. www.linkedin.com/in/Jonathan-DeLashmit

1. Facilitate a VSM Meeting

The purpose of the Value Stream Map (VSM)³ and associated analyses is to create a detailed, accurate, annotated diagram of an existing process that is used to identify what kind of waste exists, what is causing that waste, how to reduce or eliminate that waste, and how to measure the impact of making those changes.⁴

Start with the right approach

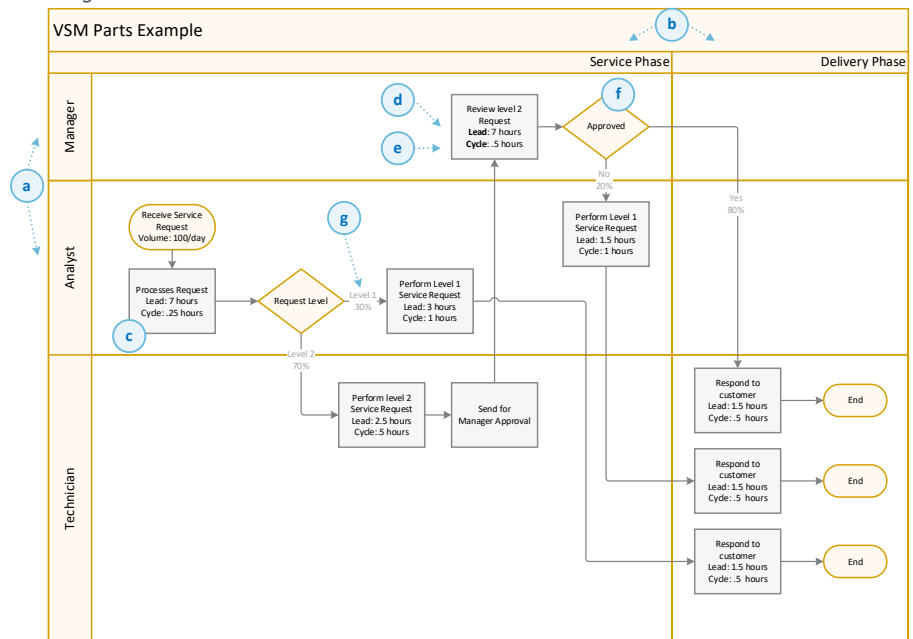
This section is intentionally named Facilitate a VSM Meeting and not Produce a VSM because running a quality meeting focused on engaging participants to uncover the full picture of the process in the form of a VSM will (1) produce more complete information, and (2) reduce instances of pushback down the road by including those who will eventually have to adopt the changes identified in your effort.⁵

Know what you are trying to build

A VSM is comprised of several parts that each play an important part in future analysis. (See Figure 1)

- Roles:** A performer that completes one or more process steps.
- Phases:** A general grouping of a portion of a process.
- Process Steps:** A single activity done by one role in one sitting⁶.
- Lead Times:** The amount of time from when a process step is started to when the process step is finished.
- Cycle Times:** The amount of actual “hands-on” time performing work during a process step.
- Decisions:** A point in the workflow where the process splits⁷.
- Percent Flow:** The portion of volume that follows a decision path.

Figure 1



1.1. Before the Meeting

Establish support for the engagement

Communicate with Stakeholders who are (1) in the position to approve recommended changes to the process, (2) impacted by changes to the process, and (3) responsible for allotting resources needed for the engagement. Provide a high-level overview of what the engagement entails and confirm that they will provide the necessary resources and are prepared make changes according to recommendations⁸.

³ It's a Visio map. If you work in a corporate environment, you've seen a million of these. What's important about this one is what it can do for you!

⁴ These instructions are based on the tools found in [The Lean Six Sigma Pocket Toolbook](#) (George, Rowlands, Price, & Maxey, 2005) but have been adapted based on my experience. For more details, check out the source!

⁵ This might seem like an unimportant platitude, and it might be, but I have found success adopting this mindset for this kind of effort.

⁶ Most Process Steps will have a lead time and cycle time. If a step does not, it can probably be included in an adjacent step and is only split out for context.

⁷ Decision boxes should be accompanied by a process step and should not have an associated lead time or cycle time.

⁸ This can be difficult, and it is not *exactly* part of building a VSM. Change Management plays an important role in Process Improvement.

Invite the Right Participants

You want to get the information from the horse's mouth. Invite the meeting participants who have experience executing the process as it is currently done⁹.

Prepare Participants

Set your participants up for success. Include an agenda, the purpose of the meeting, and what kind of information participants will need to provide in the meeting invite.¹⁰

1.2. During the Meeting

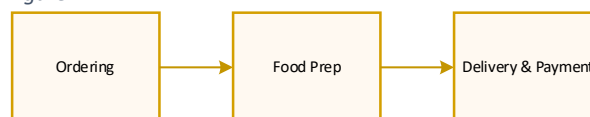
Warm up the Participants

- (1) Begin with an introduction.¹¹
- (2) Establish that the objective of the meeting is to record a complete and accurate representation of the process.¹²
- (3) Show a completed hypothetical example of a VSM and define the different parts.¹³ (i.e., Lead Time, Cycle Time, Percent Flow, Roles, etc.)

Establish Phases¹⁴

- (4) Lead a discussion to create a high-level 3-5 step flow chart of the process. (See Figure 2)

Figure 2



- (5) Use the steps from the high-level flowchart as the phases. (See Figure 3)

Figure 3

Adding Phases Example			
	Ordering	Food Prep	Delivery & Payment
Role 1			
Role 2			

Populate VSM¹⁵

- (6) Discuss each phase of the process¹⁶ and fill in the VSM with Roles, Process Steps, Decision boxes, and associated data.¹⁷ (See Figure 4)

⁹ How can you identify participants? Talk to the stakeholder responsible for allotting resources; there is a reason you included them in the beginning.

¹⁰ Participants may be skeptical about why this engagement is happening. They are worried that the engagement might make them look bad or maybe even lose their job. It's important to recognize that even if they are wrong, their discomfort with the situation is very real to them.

¹¹ Obviously. But seriously, try to put the group at ease. The more casual the dialogue, the more participation you will get which will result in better information.

¹² There is a reason that you state this upfront, and that reason is so you can draw focus back to the objective and maintain pace throughout the meeting. There is A LOT to cover!

¹³ Why hypothetical? If you show them a version of their own process they will rush ahead. Use a hypothetical to keep participants from getting distracted.

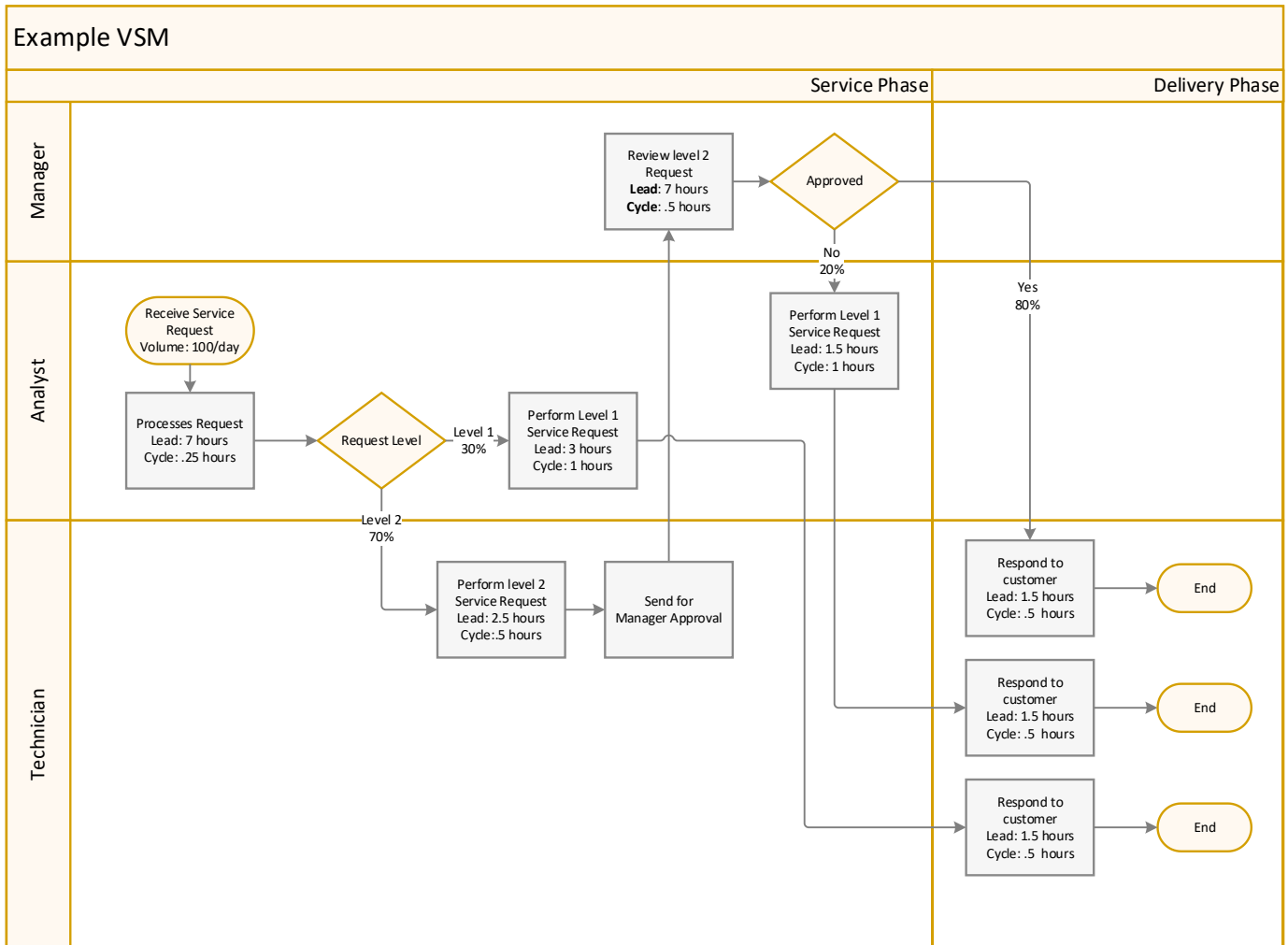
¹⁴ If you are familiar with the process, you can complete this prior to the meeting and simply ask the participants to verify that it is correct. Participants may try to overthink this, don't let them. If you feel like it needs changed after learning more, then change it.

¹⁵ Sounds easy enough, right? This is the entire meeting.

¹⁶ Sometimes this can feel like herding cats. In addition to asking probing questions and recording the process, you will also need to squash conversations about how to fix the process and how the process hypothetically should be done.

¹⁷ Don't dwell on not filling in the Lead & Cycle times if it interrupts the pace of the meeting. Ask if someone is willing to gather that information outside of the meeting and then move on.

Figure 4



Review and gather feedback

- (7) Walk through the map to verify steps are correct and to fill in missing information.¹⁸ If there is information that is not available in the moment, establish resources and next steps to fill in the remaining information after the meeting.¹⁹
- (8) Ask participants if there is any part of the process that is especially frustrating.²⁰
Ask participants what changes they would make. Take note any issues or “headaches” that are not represented in the map so they can be included in the root-cause analysis.

You now have a Current State Map.²¹

1.3. After the Meeting

Send a follow up email to the participants thanking them for their time and expertise. Include a summary of the work that was completed to verify accuracy. Follow up with any participants that need to provide additional information to complete the map.

¹⁸ I don't think I have ever completed the review without changing the map. Allow time for this review, it is important to get it right!

¹⁹ All the information may not be available, you may need work with the meeting participants to set up observations to record Lead & Cycle times for specific steps.

²⁰ This is always interesting and very important! If you can address these issues later in the engagement, you can use it to help increase adoption.

²¹ Well, you will when everyone gets back to you with the data they didn't have in the meetings.

2. Facilitate a Value-Add Analysis Meeting

A Value-Add Analysis is a meeting not unlike the VSM meeting. Participants review the Current State Map to identify which steps are (1) essential activities that tangibly add value for the customer, (2) activities that are required by law or regulation but do not tangibly add value for the customer, and (3) activities that are not required by law or regulation and do not tangibly add value for the customer.

Know what you are trying to build

The desired result from a Value-Add Analysis is a version of the Current State Map that identifies Value Add, Required Non-Value Add, and Non-Value Add steps.

- Value Add steps are essential activities that: (1) the customer is willing to pay for, (2) the action transforms product/service in an observable way, and (3) the activity is only completed once.
- Required Non-Value Add steps are steps that must be completed in accordance with regulations²².
- Non-Value Add²³ steps are any remaining steps that don't tangibly change the product or service and are not completed because of regulation²⁴.

2.1. Before the Meeting

Invite the Right Participants

The Value-Add Analysis meeting should include participants who (1) attended the VSM meeting, (2) are familiar with laws and regulations that impact the process, and (3) who can adopt the perspective of the customer. Only invite participants that are essential for the meeting.

Prepare Participants

Include (1) an agenda, (2) the purpose of the meeting, and (3) a copy of the map in the meeting invite.

2.2. During the Meeting

(1) Begin with a non-work-related example²⁵. (See Figure 5)

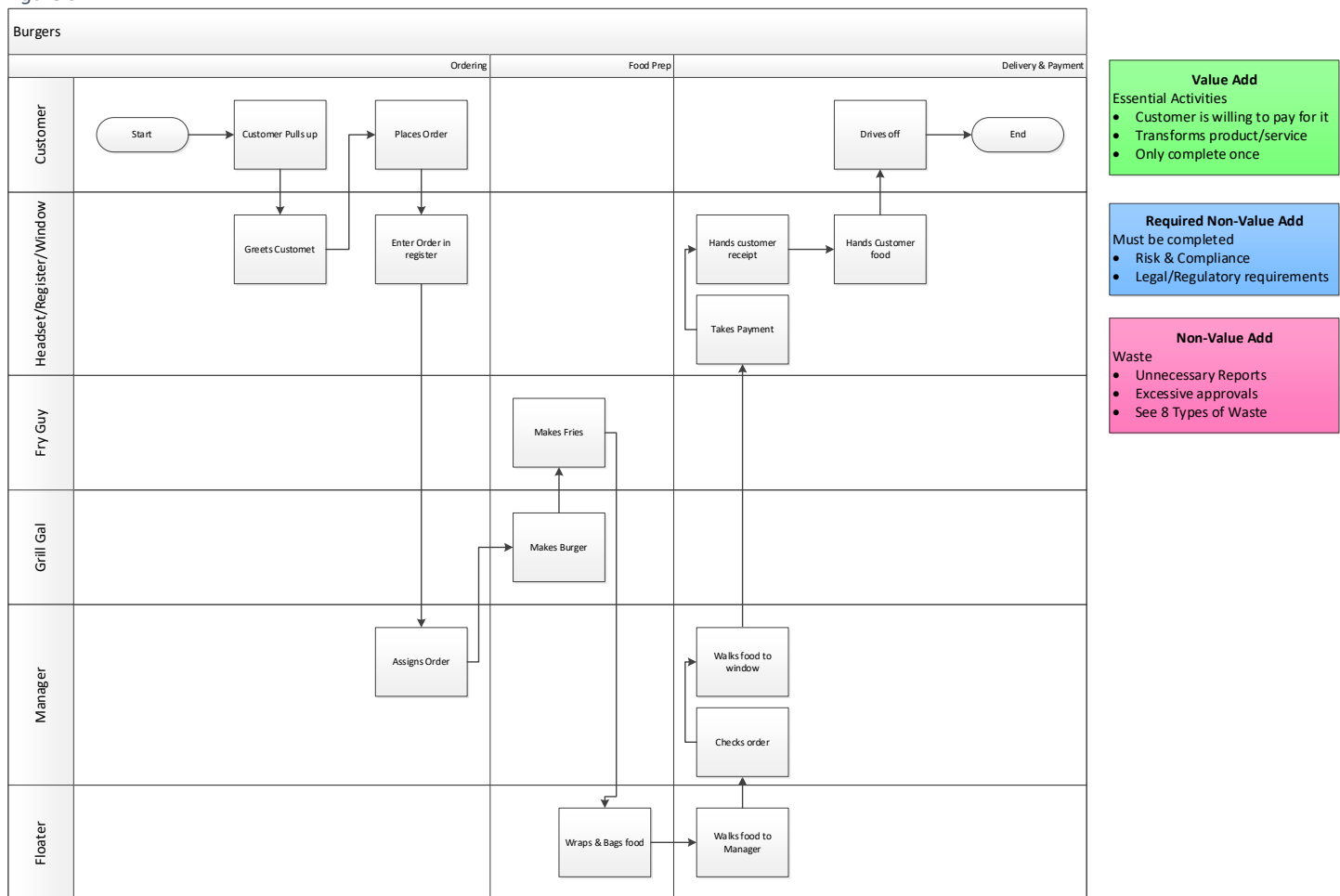
²² You may need to challenge the group if they claim a task is being done because of regulations, they might assume that it is being done because of a regulation or they might be overprocessing and generating waste to be extra-adherent to regulations. What they claim to be Required Non-Value Add steps are often Non-Value Add steps.

²³ Just because a step is marked as non-value add doesn't mean that it is going to be changed or removed from the process, it only means that the step should be examined for possible improvements.

²⁴ Participants are likely to react negatively to the assertion that "their job doesn't add value". Some participants will misunderstand the meaning of "Non-Value Add" no matter how many times you review it.

²⁵ Using a non-work-related example will help get the participants used to the exercise without having an emotional reaction to labeling parts of their job as "Non-Value Add". Some of them will still probably have an emotional reaction.

Figure 5



- (2) Discuss each of the definitions²⁶.
- (3) Walk through the example discussing and color coding each step with the participants.
- (4) Walk through the real Current State Map discussing and labeling each step with the group just like you did with the example.

2.3. After the Meeting

Send a follow up email to the participants thanking them for their time and expertise. Include a summary of the work that was completed to verify accuracy. Ask for any additional thoughts and insights.²⁷

²⁶ Post the definitions in a very visible location. Review the definitions whenever there is a dispute during the discussion.

²⁷ Continuous feedback is vital for gathering the most complete and accurate information.

3. Facilitate Root Cause Analysis/Solutions Meeting

Root Cause Analysis is an important step that is often skipped when problem solving. This can lead to addressing the symptoms of a problem and not the cause, which often creates new symptoms from the same cause. A solution should be designed to address a root cause that results in eliminating or reducing the problem.²⁸

Know what you are trying to build

The desired result from root cause analysis is a list of activities that are impacted by waste that are described as problem statements and associated to root causes as determined by a [Five Whys](#) exercise.

3.1. Before the Meeting

Invite the Right Participants

The Root Cause Analysis meeting should include participants who (1) attended the Value-Add Analysis meeting, and (2) have a big picture view of the process. Only invite participants that are essential for the meeting.

Prepare Participants

Prior to the meeting, send the participants a list of the [8 types of waste](#), and instructions for completing a Five Whys exercise.

3.2. During the Meeting²⁹

Create a list of opportunities

- (1) Discuss and identify specific activities in the Non-Value Add steps that may be causing one or more type of waste.
- (2) Discuss and identify specific activities that may be causing one or more type of waste for the list of additional “headaches” or issues that were noted at the end of the VSM meeting.
- (3) Review the map for waste that exist across more than one process step.

Create a list of root causes for each item on list of opportunities

- (4) Complete a [Five Why Analysis](#) for each item from the opportunities list.^{30, 31, 32}

Identify Solutions and Potential Impacts

- (5) Address each cause with a potential process change.
- (6) Estimate and record the impact the process change will have on Lead Times, Cycle Times, and Percent Flows in the Current State Map.

3.3. After the Meeting

- (1) Create a copy of the Current State Map and rename it Future State Map.
- (2) Make changes to Future State Map based on recommended process changes.
- (3) Calculate [Composite Lead Time](#) and [Composite Cycle Time](#) of both Current State and Future State
- (4) Create a [Recommendation Document](#).

²⁸ This is worth emphasizing: Address the cause, not the issue. If the issue doesn't improve, either the root cause or the solution was incorrect.

²⁹ This should be done in a separate meeting with the same participants who were present for the Value-Add Analysis meeting. It may be tempting to combine the meetings, but the participants will likely be fatigued after the Value-Add exercise, and you want fresh minds for Root Cause Analysis and Identifying Solutions.

³⁰ Some items from the opportunities list might share a common root cause, meaning that one solution could correct multiple problems.

³¹ Some items from the opportunities list might have multiple causes.

³² A root cause won't ever be the fault of an individual. If the reason feels like you're assigning blame to someone then you're not looking at the process and the problem needs to be thought through a little more.

4. Implement

Implementation can be complicated for a variety of reasons. If you properly engaged the correct stakeholders at the beginning, you should be able to overcome any obstacles that arise.

4.1. Gain Recommendation Approval

- (1) Share a draft of the Recommendation Document with participants from the Root Cause Analysis/ Solutions meeting to confirm accuracy³³.
- (2) Update Recommendation Document based on feedback.
- (3) Present recommendations to the stakeholders for approval.
- (4) Update the Recommendation Document to reflect approved recommendations.

4.2. Plan Implementation

Determine Implementation Phases

Implementations don't always happen all at once.³⁴

- (1) Sort recommendations by who is impacted by the change.
- (2) For each group, determine if implementation of the recommendations needs to be sequenced.

Treat each sequence for each group as its own phase of the implementation.

Procure resources for each phase

- (3) Determine what requirements are needed prior to implementation such as training, additional equipment/ software, etc.³⁵

Gain approval for Implementation Plan

- (5) Present Implementation Plan to the stakeholders for approval.³⁶
- (6) Make updates according to feedback.³⁷

Finalize and communicate Implementation Plan

- (7) Request the stakeholders to communicate a high-level version of the entire Implementation Plan, including each phase and the expected impact from each change.
- (8) Provide training resources.
- (9) Provide detailed instructions for implementing the changes.
- (10) Provide an outlet for anonymous feedback with a cutoff date.
- (11) Adjust and communicate based on feedback and set an implementation date.

4.3. Implement

Before implementation

- (1) Review Implementation Plan with stakeholders and leadership.
- (2) Check that resources are available.
- (3) Ensure that communication lines will be open.

³³ Avoid sending the document as an attachment to prevent different versions circulating before recommendations are approved.

³⁴ This is usually for one of 3 reasons, (1) some recommendations can be implemented with little to no effort or impact on employees, (2) Some recommendations might be dependent on other recommendations being in place, or (3) there may be too many recommendations to effectively implement all at once.

³⁵ Considerations may be needed for 3rd party vendors or meeting company risk & compliance requirements.

³⁶ There may be some politicking involved here. Each organization is different. The best I can tell you is: Be aware and seek assistance.

³⁷ The map, the recommendations document, even the implementation plan are all "living documents" that are subject to change as you continue to gather more information!

*During Implementation*³⁸

- (4) Ensure that resources are available to answer questions.
- (5) Check in with Leadership and employees, discuss and resolve unforeseen issues and communicate broadly for consistency.

After Implementation

- (6) Debrief with Leadership and Employees to get feedback.³⁹
- (7) Adjust based on feedback and communicate broadly for consistency.

Repeat until stable.

³⁸ Some Implementations go very smoothly, many of them don't. Be unflappable. If a problem presents itself, address it, learn from it, and move on.

³⁹ Don't just share the credit. Lay it on thick. They did the work, you just guided them. Good job!

Appendix

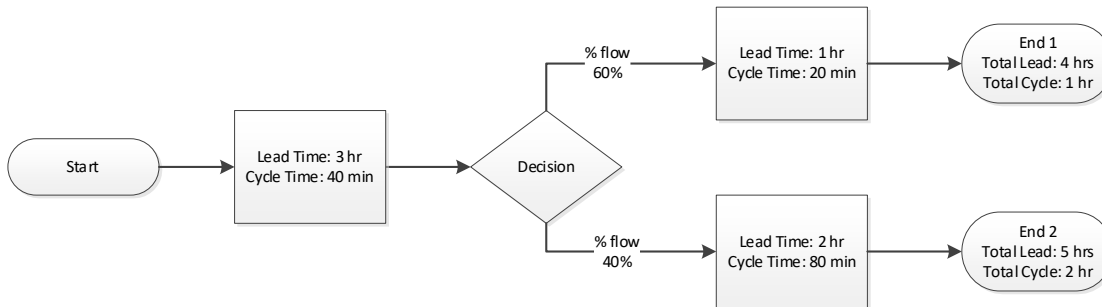
Composite Lead & Cycle Time

Composite Lead & Cycle Time are the average times it takes for a use-case to travel through a process considering the different paths use-cases might take.

Example:

Composite Lead Time: $(4\text{hrs} \times 60\%) + (5\text{hrs} \times 40\%) = 4.4\text{hrs}$

Composite Cycle Time: $(1\text{hr} \times 60\%) + (2\text{hrs} \times 40\%) = 1.4\text{hrs}$



8 types of waste

The 8 Wastes of Lean are a list of descriptions used to identify and classify wasteful activities and provide a framework for process improvement.

1. Defects: Waste from a product or service failure to meet customer expectations.
2. Overproduction: Waste from making more product than customers' demand.
3. Waiting: Waste from time spent waiting for the next process step to occur.
4. Unused Talent: Waste due to underutilization of people's talents, skills, and knowledge.
5. Transportation: Wasted time, resources, and costs when unnecessarily moving products and materials.
6. Inventory: Wastes resulting from excess products and materials that are not processed.
7. Motion: Wasted time and effort related to unnecessary movement by people.
8. Extra-Processing: Wastes Related to more work of higher quality than is required.

Five Why Exercise

The Five Whys is a detailed questioning process designed to drill down passed the symptoms into the details of a problem to uncover the root cause.

Example:

Identify a problem – Got a speeding ticket

1. "WHY?" – Late for work.
2. "WHY?" – Woke up late.
3. "WHY?" – Alarm didn't work.
4. "WHY?" – Batteries were dead.
5. "WHY?" – Forgot to replace them.

State the Root Cause – Batteries are not consistently replaced.

Address the Root Cause with a solution – Replace batteries every New Year's Day.

Recommendation Document Example

Summary

[Context of the engagement]

"In December of 2022 the *ACME Team* partnered with *Process Team* in an effort to examine and improve the ACME Process.

This effort has identified a total of 22 opportunities and 28 recommendations resulting in the possible estimated savings of approximately 17 weeks."

Recommendations

[Context of changes to the process]

"It is understood that ACME is implementing a new Work Intake tool, recommendations impacted by this change will be noted as such.

It is recommended that the *ACME Team* partner with the *Process Team* to design and execute a plan to implement the following recommendations"

Opportunity	Recommendation	Anticipated Impact
Problem Statement 1	Root Cause 1 and how to address it. Root Cause 2 and how to address it.	Anticipated Impact specific to each cause addressed.
Problem Statement 2	Root Cause 3 and how to address it.	Anticipated Impact specific to each cause addressed.
Problem Statement 2	Root Cause 3 and how to address it.	Anticipated Impact specific to each cause addressed.

Method

Value Stream Map

The *ACME Team* and *Process Team* collaborated to produce a detailed process map.

Value-Add Analysis

The *Process Team* facilitated an exercise with the *ACME Team* to identify Value-add and Non-value add steps in the process and update the Process Map into a Fully-Annotated Value Stream Map.

Identifying Opportunities

The *Process Team* met with representatives from the *ACME Team* to review the Value Stream Map and identify different wastes in the process that could lead to improvement opportunities.

Root Cause Analyses

The *Process Team* met virtually with representatives from the *ACME Team* to review the improvement opportunities and identify root causes and potential solutions.

Works Cited

George, M. L., Rowlands, D., Price, M., & Maxey, J. (2005). *The Lean Six Sigma Pocket Toolbook*. New York, NY, United States of America: The McGraw Hill Companies.