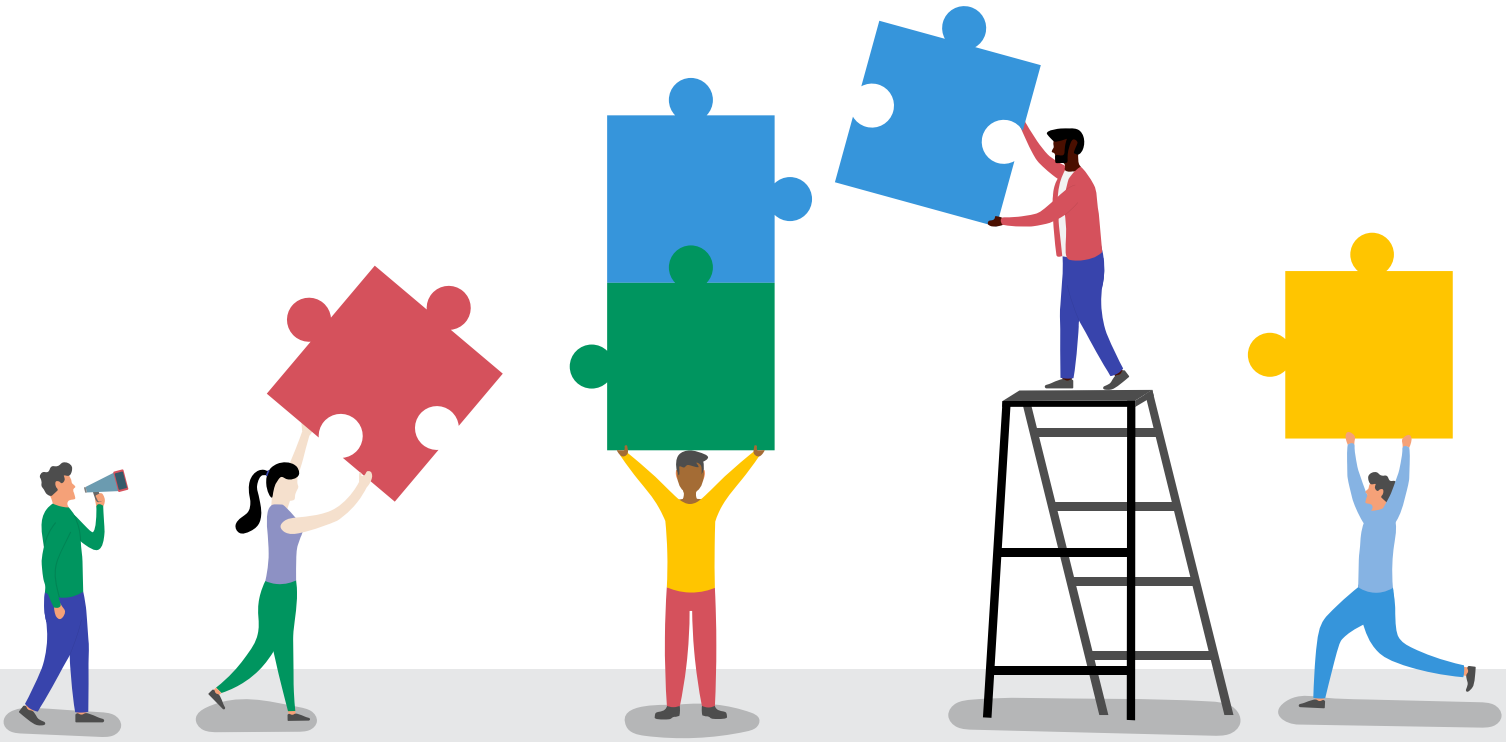
How to Use the A3 Process to Lead, Manage, Mentor, and Solve Problems

This selection of *Lean Posts*, the most-read articles on the topic, highlights and explains what you need to know about using this powerful lean practice to gain its most impactful benefits.



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Understanding the Many Facets of 'the A3'

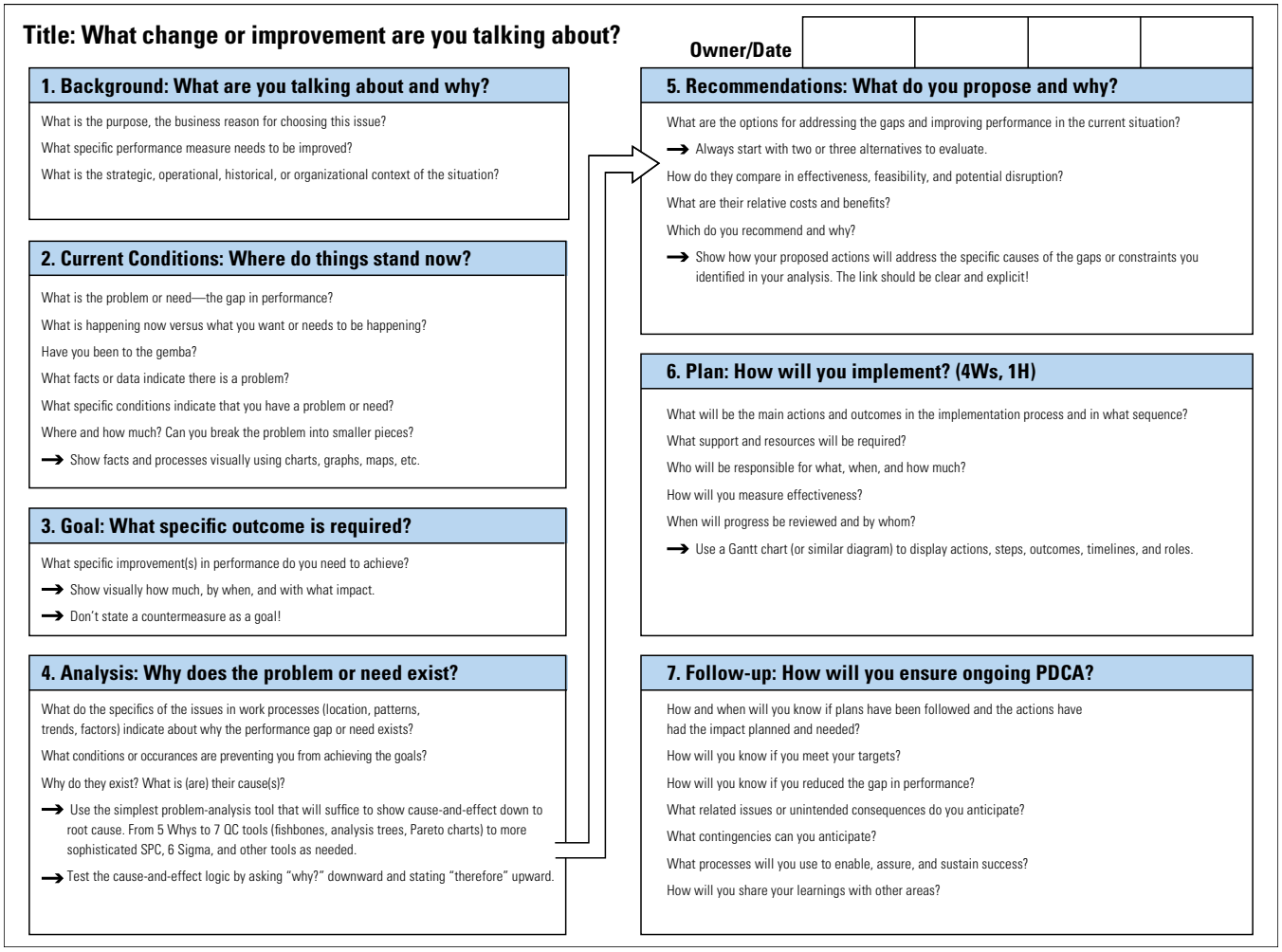
By Patricia Panchak

If you're sometimes confused by references to "the A3," you're not alone. The term "A3" is used as shorthand to refer to various lean practices. Because understanding this fundamental element of lean management is crucial to a successful lean transformation, here's a guide describing the multiple contexts in which lean practitioners use the term "A3."

1. **A standard paper size:** At its most fundamental, "A3" is the international term for a sheet of paper 297 millimeters wide and 420 millimeters long. The closest U.S. paper size is the 11-by-17-inch tabloid sheet.

2. **A template:** Many companies and individuals use an A3-sized document pre-printed with the steps needed to conduct lean problem-solving or improvement efforts, with generous white space for "A3 owners" to record their progress. While they refer to this document as a template, an "A3" is not a template.

3. **A storyboard:** As users record their problem-solving or improvement project's progress, the A3 becomes



The Lean Lexicon, Fifth Edition defines the "A3 Report" as "a Toyota-pioneered practice of getting the problem, the analysis, the corrective actions, and the action plan summarized on a single sheet of large (A3) paper, often using graphics.

The practice's versatility is evident in the many ways practitioners refer to it. Indeed, the Lean Lexicon notes, "At Toyota, A3 reports have evolved into a standard method for summarizing problem-solving exercises, status reports, and planning exercises like value-stream mapping."

a storyboard used to facilitate communication, collaboration, and coordination with other stakeholders affected by the goal the A3 owner is working toward (e.g., solving a problem or improving a process). By having all the facts about the effort in one place, logically presented and summarized, the A3 owner is better able to gain buy-in from other stakeholders for recommended process changes.

4. **A report:** Once the A3 problem-solving effort concludes, the A3 storyboard serves as a report of the problem-solving or improvement initiative, including the facts and data gathered, hypotheses considered, countermeasures tried, experiment results, corrective actions taken, and the overall thinking of the A3 owner and stakeholders. At Toyota and elsewhere, A3 reports have evolved into a standard method for summarizing problem-solving exercises, status reports, and planning exercises like value-stream mapping.

5. **A problem-solving methodology (or process):** Most lean practitioners know "the A3" as a problem-solving process guided by specific steps or questions. The left side of the A3 focuses on various elements of the problem and current condition, and the right on the countermeasures considered, tested, and chosen that resolve the issue or create a higher standard.

6. **A management discipline (or process):** At a higher level, lean leaders, managers, and supervisors use "the A3" as a means by which they oversee and guide subordinates while simultaneously helping them develop their lean thinking and practice — particularly lean leadership and problem-solving — capabilities.

   With A3 management, leaders challenge their direct reports to solve a problem. Then, with the A3 report guiding the dialogue and analysis, leaders coach them through the problem-solving process. Importantly, leaders coach by asking questions versus providing answers, ensuring the responsibility remains with the subordinate to solve the problem by pursuing facts and building consensus. Through this interaction, subordinates address the issue, allowing them to make progress toward the objective and, in so doing, learn the lean approach to leadership and management and gain problem-solving capability.

7. **A3 thinking (or analysis):** Ultimately, most A3 coaches and advanced lean practitioners refer to "the A3" as a thinking process. In this case, the term refers to a systematic approach to resolving problems or improving work processes. Someone can follow this systematic approach, regardless of whether they are guided by or record their findings on an A3 document.

8. **An alignment tool:** Advanced lean organizations that have incorporated lean thinking and practices throughout their operations use "A3s" as part of their strategy deployment and execution efforts. In this case, the A3 process ensures a standard approach to managing and coaching people, solving problems, and improving work processes, all directed toward achieving corporate objectives. (See "*Meeting Strategic Objectives*.")

Overall, the A3, however deployed, exemplifies the learn-by-doing philosophy embedded in lean thinking and practice. ■

Discovering the True Value of the A3 Process

The challenge with the A3 process isn't in learning to write an A3 report; it's in understanding how to use it as a managerial process.

By John Shook

After LEI published *Managing to Learn: Using the A3 Management Process to Solve Problems, Gain Agreement, Manage, Mentor, and Lead*, I reflected on the many conversations we had before deciding how to present the material, which led me to recall my experience discovering the multifaceted nature of the process. I'm sharing my reflections because I believe they will help you understand the many benefits of the A3 process.

Writing about the A3 Process

LEI had wanted to publish a book about the A3 process for several years before finally publishing *Managing to Learn*. My dilemma during this time was that, while I was honored to be asked and could see the value of a book about the A3 process, I saw a significant challenge in writing it. The problem was: How would we convey how to use the A3 process as an effective — a superior — way to manage people?

If we presented the A3 as a tool and only showed how to write an A3 report, we would fail to demonstrate the broader and more significant aspects of the A3 process. So, I especially didn't want to write about the A3 process as if it were simply a tool or report. I have long viewed that using tools for tool's sake (where everything is a hammer looking for a nail) is one of the most pernicious problems in "LeanWorld."

"How would we convey how to use the A3 process as an effective — a superior — way to manage people?"

So, working with the LEI editorial team, we quickly explored the idea of telling the story of how an individual prepared and used an A3 proposal. But even well-executed, that alone wouldn't necessarily resolve my problem. I needed to tell the story from "both" sides since it takes two (at least) to gain the full benefits of the A3 management process.

After some discussion — and even rapid prototyping! — we landed on the equally radical but more practical (and innovative) idea of telling the story through two perspectives in running parallel columns. The two-column, side-by-side structure of the book was the most effective way to dynamically show the dual or multifaceted way of thinking embodied by the A3 process. First, it must generate learning for both the mentor and mentee. Second, it must simultaneously address a problem while exposing new ones.

My own experience many years ago had revealed to me these and other dynamics of using A3 thinking.

Discovering the 'A3's' True Value

I discovered the importance of the A3 process firsthand, as do all Toyota employees. In my case, my first managers, Isao Yoshino and Ken Kunieda, and coworkers desperately needed me to learn the thinking and skills that would make me useful! But, the process I went through was in no way special. When I joined Toyota in Toyota City (where, for a time, I was the only American) in late 1983, every newly hired college graduate employee began learning his job by being coached through the A3 process. The new employee would arrive at his new desk to find waiting for him a problem, a mentor, and a method to learn for solving that problem. The entire process was structured around the plan-do-check-act (PDCA) improvement cycle and captured in the A3 report.

The newcomer's problem had been determined by his manager and scoped out by the mentor the manager assigned. The new employee would begin addressing the issue using this method. He would first seek to understand the situation by clarifying, analyzing, and investigating its causes. Then he would brainstorm and evaluate potential countermeasures. Finally, he would propose — that is, "sell" — his recommended countermeasure, which would often involve a simple trial or small experiment. Critically, in "selling" his proposal, he would strive to continually improve the content and accuracy of the A3 report by obtaining input and, as a result, agreement and support from others.

> "What is significant is how Toyota has systematized A3 thinking throughout the organization as a core management discipline."

For example, my work team used the A3 process to solve a simple office problem, one common to anyone who has worked in an office and encountered the question, "Where's the damned file?" The tools and practices the team used were unremarkable. What was remarkable was the effort and discipline the team put into such a mundane issue.

While the solution improved our team's ability to find the right information at the right time, the specific problem, the more significant benefit to our team, was the training itself. By learning to apply the problem-solving tools in this situation, all the team members learned how to use them in others. Further, the training enhanced their thinking skills, which they could apply to every issue they would ever encounter. Practiced students of Total Quality Management (TQM) would quickly recognize the example as a typical Quality Control (QC) Circle project report. What is significant is how Toyota has systematized A3 thinking throughout the organization as a core management discipline.

> "The more A3s I wrote, the better I became at the A3 thought process. Internalizing that thinking is the objective, not technical mastery of the format."

"Where's the damned file?" was a simple problem, but the value of learning the process used to solve it extended far beyond its face value of enabling us to find files faster. That value is the education and learning embedded within a correctly executed A3 problem-solving process. As individuals or teams work through the A3 process, working on the improvement project, they learn problem-solving by doing. Indeed, the A3 process exemplifies learning through doing at its best.

The more A3s I wrote, the better I became at the A3 thought process. Internalizing that thinking is the objective, not technical mastery of the format. The more cycles of reflection and learning that an individual can experience, the better it is for that individual and the organization.

Using the A3 'Tool' for Problem-Solving

Still, the most fundamental use of the A3 process is as a simple problem-solving tool that you can use, applying the

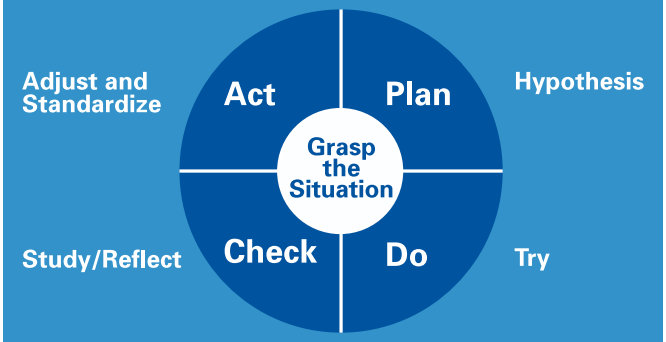
underlying principles and practices in any organizational setting. So basically, the A3 process standardizes a method that helps people understand and respond to problems; it encourages root cause analysis, documents processes, and represents goals and action plans in a format that triggers conversation and learning. The A3 report, then, is a standardized way of summarizing problem-solving exercises.

A good A3 report has sound problem-solving — science — embedded inside. But it achieves much more, exemplifying this great quote by the great scientist Henri Poincaré: "Science is built of facts the way a house is built of bricks, but an accumulation of facts is no more science than a pile of bricks is a house."

> "The A3 problem-solving process encourages root cause analysis, documents processes, and represents goals and action plans in a format that triggers conversation and learning."

In precisely the same way, a good A3 report is more than a collection of data that solves a problem — it tells a story that can coalesce an organization. ■

Plan, Do, Check, Act (PDCA)



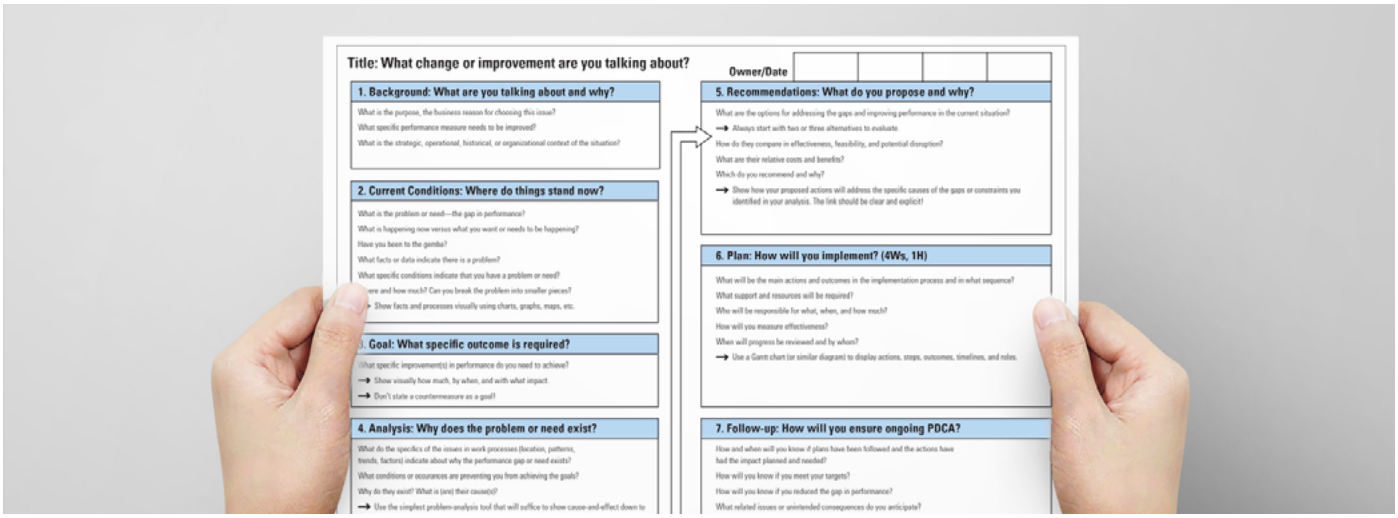
Also known as plan-do-study-act (PDSA).

An improvement cycle based on the scientific method of proposing a change in a process, implementing the change, measuring the results, and taking appropriate action (see illustration). It also is known as the Deming Cycle or Deming Wheel after W. Edwards Deming, who introduced the concept in Japan in the 1950s.

The PDCA cycle has four stages:

Plan:	Determine goals for a process and needed changes to achieve them.
Do:	Implement the changes.
Check:	Evaluate the results in terms of performance.
Act:	Standardize and stabilize the change or begin the cycle again, depending on the results.

Source: *Lean Lexicon, Fifth Edition*



How to Start the A3 Problem-Solving Process

Why the best, most productive way to "start an A3" is by recognizing that the A3 problem-solving methodology is a "slow-thinking" process.

By David Verble

Are you having trouble getting started solving problems using the A3 problem-solving process? When I teach workshops on A3 thinking, creation, and use, this comes up as one of the most challenging parts of executing the A3 methodology. So, if you find yourself looking at a blank sheet of 11-by-17 paper wondering where to start, here are some thoughts from what I've learned doing and teaching the A3 problem-solving methodology for years, which I believe may help you.

The first lesson is simple if counterintuitive. When people ask, "Where do I start to 'write an A3?'" I reply, "Don't start with writing." They generally respond by asking, "Then where do I start?" And my answer is always: "Start with the thinking."

There are two key points to keep in mind here. First, the A3 report, or storyboard (the written document), is the result of A3 thinking, not the process of A3 thinking itself. So, the A3 is a way to capture and organize your plan-do-check-act (PDCA) problem-solving thinking, but completing it does not automatically lead to valid A3 thinking.

"Resolving issues using the A3 methodology should involve lots of asking, listening, and communicating throughout the process to ensure you are getting the knowledge, thinking, concurrence, and support of others who have a stake in the situation."

Second, A3 thinking is a way to work systematically through how to address a problem or need. Getting to that result involves understanding the problem or need at a concrete level, understanding the factors in the situation that are barriers to moving to desired conditions, and deciding the best options for making changes in the direction you want. And resolving issues using the A3 methodology should involve lots of asking, listening, and communicating throughout the process to ensure you are getting the knowledge, thinking, concurrence, and support of others who have a stake in the situation.

That's a lot of work and thinking. And it can't be accomplished by simply starting to fill in the boxes in the A3.

Use the A3 as a Guide

When starting an A3 problem-solving initiative, you should consider the blank A3 merely as a guide leading you through the problem-solving process, one "box," or step, at a time. But at each stage, you must first think about and investigate the problem situation and only then record your thinking.

However, do not expect to complete the process sequentially. As you work through the A3 methodology and complete the storyboard, you will continue learning about your problem situation. So, be prepared to go back and revise what you wrote earlier as you get deeper into the problem.

Tell a Problem-Solving Story

Understanding and following these guidelines are crucial to a successful A3 problem-solving because the A3 process must do more than identify a resolution to the problem. The A3 process and the storyboard that results must also tell a problem-solving story that is convincing to others — that brings them along in a thinking process and demonstrates the actions you are recommending make sense. Gaining this buy-in requires getting as many facts as possible in a reasonable time and having the right facts to support your conclusions. Unfortunately, it's difficult, if not impossible, to create such a convincing story using "fast thinking."

Why 'Slow Thinking' is Vital to A3 Thinking

The difference between "Fast Thinking" and "Slow Thinking" and the importance of the difference between the two is described in the book *Thinking, Fast and Slow* (2011) by Daniel Kahneman. Kahneman received the 2002 Nobel Prize in Economics for his behavioral research on human judgment. The book summarizes 25 years of research, by Kahneman and others, on the basic patterns in how humans solve problems and make decisions. He contends that our brains have two different thinking systems, one that works fast and one that is slow.

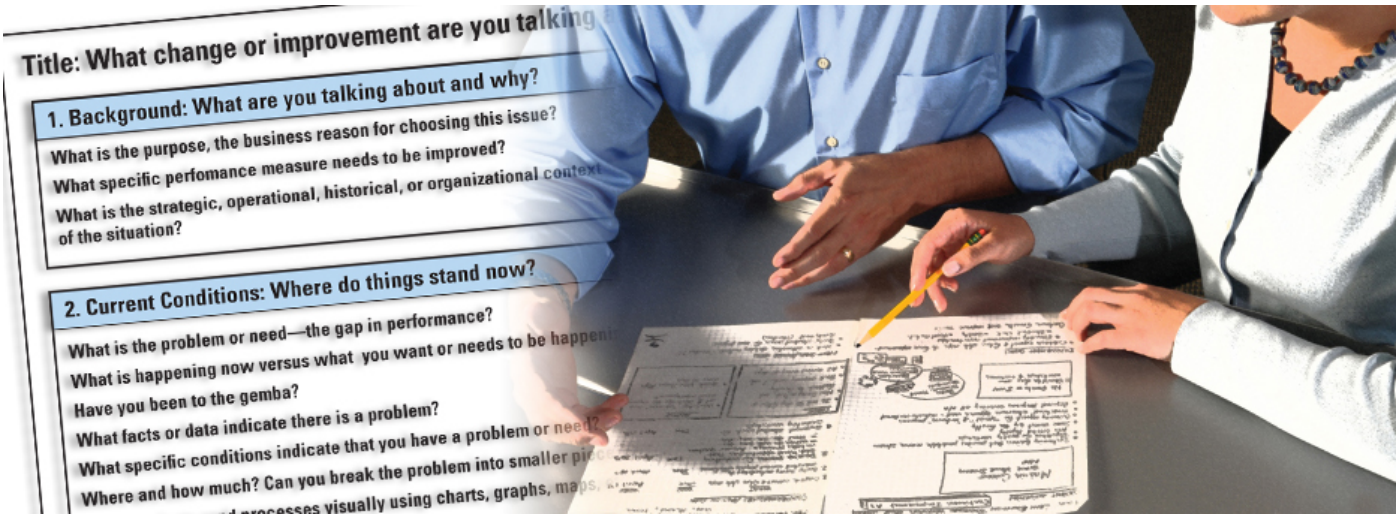
1. **System 1**, our fast-thinking system, houses our emotions and intuition, and it processes information and makes decisions automatically. "What you see is what there is" basically describes our minds jumping to conclusions, drawing simply on what is in front of us without looking for further evidence or data.

2. **System 2**, the slow-thinking system, describes the part of the brain that gets engaged in rational, logical thought, concentration, and fact-based judgments. It saves us from many of the runaway automatic reactions of System 1. However, its influence on our problem-solving and decision-making habits is limited because of our automatic reliance on System 1.

If Kahneman's claim is valid — and he makes a rather good case for it with the research — it contains a couple of important messages for anyone thinking about putting themselves on the line as the owner of an A3. First, go-fast, jump-to-solution (or action), take-what-you-see-and-run-with-it thinking seems to be our default problem-solving and decision-making process. That means we must be excellent at seeing and 100% accurate in our impressions, assumptions, and intuitions to hit the mark with our solutions and decisions.

Second, the alternative of slow, systematic, getting-the-facts-and-knowing-the-actual-conditions reasoning is not a natural act for most of us. That means we must work to slow down when we start work on an A3 because our preferred thinking style is unlikely to produce a problem-solving story that will stand up to scrutiny when we make claims about what action should be taken based on it.

I have had the experience of being out there on an A3 limb making claims without the facts to support them, and it's not fun — unless you just like pain and embarrassment. That is why I advise anyone needing to do an A3 to prepare for the work ahead by trying to activate the slow-thinking system in their brain. ■



Why the A3 Process Involves More than Filling in Boxes

As she details how to problem-solve using the A3 methodology, a veteran lean coach explains why it's essential to understand that completing an A3 problem-solving is a thinking process, not a form-filling-out process.

By Tracey Richardson

In my experience, too many lean practitioners still approach the A3 report merely as a "template" with several boxes to fill in. Whenever I come across this, I try to help people see how limiting — and wrong — this view is. Instead, as my Japanese coaches taught me, an A3 report is a tool that encourages a systematic way of thinking through and addressing problems. Indeed, they showed me that the A3 process, which is based upon the plan, do, check, adjust (PDCA) improvement cycle, is designed as a way to "share wisdom" with the rest of the organization.

With the goal of "sharing wisdom" in mind, here is the way to "complete an A3."

State Your Purpose

First, think about purpose. Your purpose is why you're solving this problem. To do this effectively, identify the key performance indicator(s) (KPIs) you aim to improve with your problem-solving effort. Whether you want to address quality, safety, productivity, cost, or human resources, getting clear on purpose will ensure you are doing value-added work. As critical, stating your purpose in writing on the A3 enables you to share it with others, which will help you and others to establish a clear line of sight linking your problem-solving purpose with company goals.

Clarify Your Problem

Once you understand your purpose, take some time to clarify the problem by asking: What problem am I trying to solve? You may think you know, but more careful consideration usually reveals it to be something else. Also, share your A3 problem statement with others on your team to get their input.

A way to clarify the problem is by stating it as a gap between the current state and your ideal state. I suggest asking yourself two questions to understand this gap better:

- What is the current situation?
  (make it measurable by $, % , #)
- What is the ideal situation or the standard?
  (make it measurable by $, %, #)

The answers to these questions should, by default, reveal the gap or the quantifiable problem, also known as a "caused gap" problem, meaning you see a measurable difference between the current situation and the ideal or new standard situation. (A "created gap" would be more strategic, e.g., to create a lean culture throughout all functional areas of my organization.)

> " … not focusing on something you can measure will likely cause you to place a Band-Aid on or alleviate a symptom of the problem, not solve it."

I often see people neglect measurability altogether at this caused-gap step, instead stating just an opinion or assumption they have about their current state: "This is the problem, and it happens due to X, Y, and Z reasons." However, not focusing on something you can measure will likely cause you to place a Band-Aid on or alleviate a symptom of the problem, not solve it.

Break Down Your Problem

Once your problem is clarified, break it into manageable pieces. Many people try to tackle a huge or complex problem or too many problems in a single A3, but that's not what A3 thinking is for and will only cause frustration. (For significant organizational problems, lean practitioners use the hoshin kanri process.) So upfront, you want to ask the 4 W's — what, who, when, and where — which will help you narrow the scope of your problem and make sure you are only trying to solve one.

I like to use the analogy of a pie or pizza. If I try to eat the whole thing at once, I won't feel great. The same goes for A3 thinking! If I try to solve a massive problem in one sitting, it will not end well.

Getting clear answers to the 4 W's is similar to using a Pareto chart to help focus our attention on the most critical part of the bigger problem. We usually call this the "prioritized problem." No one is saying the other pieces (problems) of the pizza aren't important! We just need to eat one slice at a time. Think of it this way: you can't map a process, find the point of occurrence of an error, or identify where a discrepancy is if you're trying to do too many things at once.

Do Root-Cause Analysis

Once you identify the point of occurrences in the process, do root-cause analysis (through asking why) until you narrow down your problem to the two to three potential root causes. Remember: you are not trying to solve world hunger. Identify a manageable set of possible countermeasures. Be sure they are measurable. If, for example, my ideal state for processing insurance claims is ten days, and I currently process my claims in 20, I have a clearly defined gap: ten days. With each change to the process, I can track how much of the ten-day gap has been eliminated. Again, use specific measures to track effectiveness.

Problem-Solving

In a lean transformation or any process-improvement effort, problem-solving involves identifying and closing gaps between current and target conditions.

In a lean management system, everyone is engaged in problem-solving, guided by two key characteristics:

1. Everything described or claimed in the problem-solving process (the problem itself, the target condition, the direct cause, the root cause) should be based on verifiable facts, not assumptions and interpretations. The burden of proof on the problem solver is emphasized through questions such as, How do you know that? Did you go to the gemba and grasp the actual condition firsthand? How do you know you have agreement to your improvement plan?"
2. There is a recognition that problem-solving is never-ending, beginning rather than ending when the implementation of an improvement plan starts. A plan is viewed as a theory of both what will address the problem's cause and what it will take to implement a countermeasure to that cause. The implementation process is a learning process to find out what actually will be required to make progress toward the target condition.

Source: *Lean Lexicon, Fifth Edition*

Decide on a Countermeasure

Selecting the proper countermeasure is a crucial and challenging step. Many organizations, including Toyota, use a criteria (or evaluation) matrix to choose the most effective countermeasure. For example, you might consider such criteria as effectiveness, feasibility, cost, impact, and risk.

Once you select your countermeasure, involve all stakeholders in implementing it and track its effectiveness. Ask these primary process owners "why" things are happening at the gemba. If issues arise, resolve them by asking yourself and your team members questions, which will help build everyone's problem-solving capabilities. Also, if your countermeasure resolves the problem, it's still important to track its effectiveness for some time to ensure sustainability. Once you confirm this, you can consider this countermeasure part of the work process and add it to its standardized work.

Identify Another Problem to Solve

Once you've successfully implemented a countermeasure to one problem and established a new standard, it's time to move on to the next. Go back to the analysis step and select the next prioritized problem on the list. You want to continue to chip away at the gap, one measured problem at a time.

As you continue to use the disciplined thinking of the A3 process, you'll quickly see that it's so much more than a form to complete. Only a good thinking process (supported by doing) will give you a good A3 report, a document that helps you share your thinking and gain others' input as you improve the work of the business. Soon enough, you'll forget you ever felt eager to "fill in boxes." Instead, you'll find that you take your time, making sure the left side of your A3 is as accurate as possible — indeed, each step is as accurate as possible — before moving to the next.

As my trainers would remind me: executing a good A3 problem-solving process will give you the results you desire, not the other way around. It's not easy to do, but you have to put process before results! ■

Gemba

Gemba is the Japanese term for "actual place," often used for the shop floor or any place where value-creating work actually occurs. It is also spelled genba. Lean Thinkers use it to mean the place where value is created. Japanese companies often supplement gemba with the related term "genchi gembutsu" — essentially "go and see" — to stress the importance of empiricism.

A gemba walk is a management practice for grasping the current situation through direct observation and inquiry before taking action.

The gemba is different depending on the industry.

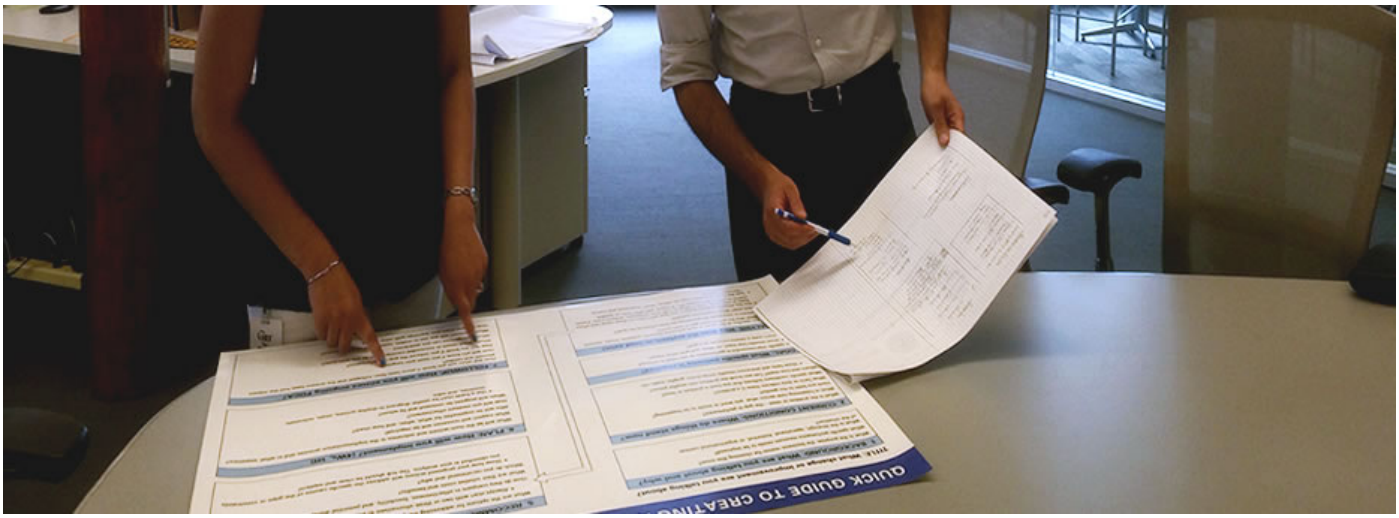
Industry	Example Gemba
Manufacturing	Factory floor
Hospital	Operating room
Hospitality	Kitchen, dining room
Construction	Job site
Software	Software code

The term often is used to stress that real improvement requires a shop-floor focus based on direct observation of current conditions where work is done. For example, standardized work for a machine operator cannot be written at a desk in the engineering office but must be defined and revised on the gemba.

It is essential for leaders to spend time at the gemba for two primary purposes:

1. To raise consciousness about the possibilities for dramatic end-to-end improvement.
2. To assess the ability of the management system to maintain stability, which is also the basis for successful improvement.

Source: *Lean Lexicon, Fifth Edition*



How to Test Your A3 Thinking

Are you fairly sure you've completed the A3 process correctly but want to test the logic of your thinking? Or could you use some advice on coaching someone through their A3 thinking? Here's an approach that could help you.

By Tracey Richardson

Have you ever been told, "You need to do an A3 on that?" Or worse, "You should fill out an A3?" Me too. So, it's worth repeating that though the A3 report appears merely to be an 11-by-17-inch document to fill out, it's much more than that. Instead, the A3 serves as your guide through a series of plan-do-check-act (PDCA) improvement or problem-solving cycles. And as you proceed through and record the A3 thinking process, it becomes a report that helps you communicate and collaborate with others. For leaders and managers, the A3 process is a way to engage people in dialogue at the gemba.

As I've said before, we need to be careful how we talk about A3s; we want to focus on the A3 thinking process, not just the A3 as a report. So, here's a way to make sure your A3 thinking is sound. And since a primary purpose of using A3 thinking is to prevent problem solvers from jumping to solutions, testing your A3 thinking process means closely examining whether you've truly engaged in every part of the process.

Try 'Reading in Reverse'

I experienced this valuable lesson/process, called "reading in reverse," firsthand from my trainers during my tenure at Toyota. So, to test that your A3 thinking is sound, read your A3 backward, from bottom-right to top-left. You can also use this approach as an A3 self-training practice, and managers can use it to help A3 owners strengthen their problem-solving capabilities.

When I see someone speeding through the problem-solving process, I encourage them to read their A3 report in reverse, knowing there are checkpoints within the A3 that would call them (or rather, their thinking) out. The PDCA process within the A3 "knows" when the logic is broken between steps. You just need to be willing to be aware and tuned in to the right frequency to hear it.

Traditionally, we read the "PDCA story" left to right. For the A3 creator/owner, the left side consists of:

- Defining your purpose
- Clarifying the problem and framing it as a measurable gap
- Breaking down the problem and selecting a prioritized problem
- Finding the point of the problem's occurrence and identifying its root cause

The right side of an A3 consists of:

- Developing countermeasures
- Identifying countermeasures and seeing them through

- Monitoring/checking process and results
- Standardizing and sharing best practices, sometimes new best practices (yokoten)

It's natural for most people (especially Westerners) to read left to right; that's how we write and read anything. The writer reveals essential elements of the story in an order that best communicates the information. Similarly, writing and reading an A3 report from left to right tells a logical story. I was always encouraged — and encourage those I coach — to make the A3 report "street-friendly." You want to create an A3 that everyone understands, even if they don't know anything about the process at hand.

Reading an A3 in reverse helps A3 owners and their leaders confirm the use of a logical, fact-based thinking process. For example, they can assure that the A3 owner, for example, didn't get lucky in choosing the right countermeasure (aka the throwing-a-dart method). Also, they can better distinguish that the problem solvers used facts, not opinions, to guide their thinking.

While this reading-in-reverse check mechanism isn't 100% full-proof (poke-yoke), it requires the A3 owner to deeply consider and answer questions about the logic of their thinking.

Reading in Reverse, Step-by-Step

To read an A3 in reverse, start at the bottom right of the A3, and read each section in reverse order. As you read, ask the following questions, checking to see whether each answer links to the A3's purpose and the gap the A3 owner is trying to close:

- Is the newly written standard or procedure meeting customer expectations (internal/external)?
- Was the new process standardized based on monitoring the process after countermeasure implementation?
- Did the countermeasure(s) prove (through follow-up) to address the root cause(s) of the problem?
- Did the root cause(s) being addressed take care of the point of occurrence in the process?
- Did addressing the root cause(s) achieve the target? (By how much and by when?)
- By meeting the target, was the prioritized problem (smaller piece of gap) addressed?
- By addressing the prioritized problem, was some percentage of the larger gap reduced?
- Did reducing the gap by some percentage help you improve a key performance indicator?
- Did improving a key performance indicator by some percentage help you meet your goal (purpose for problem-solving)?

If you can read the A3 report from left to right and then right to left and answer all the questions above, you passed the cause-and-effect logic test between the PDCA steps in both directions, back and forth.

If you can't maintain the logic, it could mean a few things:

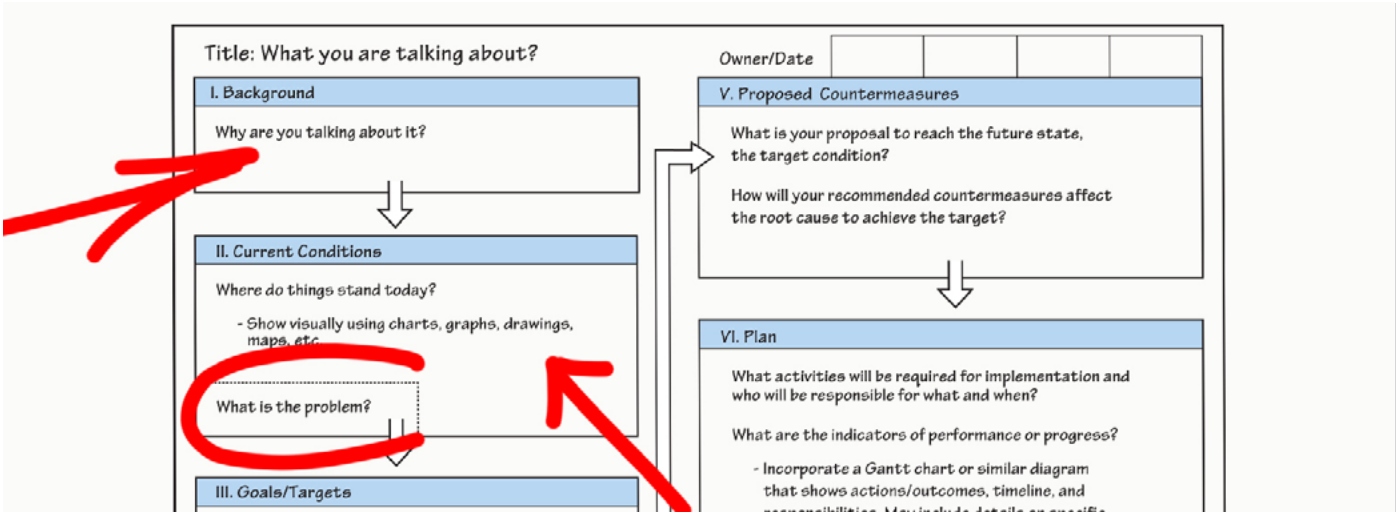
- You jumped to a solution too quickly, only solving a symptom
- You based your A3 mostly on assumptions and opinions
- You didn't "go and see" the process in person, at the gemba
- You didn't engage in genuine dialogue with the people who do the work

These are just a few factors that play into ineffective problem-solving. If you're "doing" or "filling out" an A3 behind your desk, I can say that most of the time, you will not be able to answer the questions above.

I remember my Japanese trainers sometimes saying to me, "You got lucky. Lucky is not sustainable!" This retort is representative of the thinking behind the infamous "red pen" markups many have gotten on their A3s from sensei.

So, now that you know the secret, it's up to you to understand, practice, and develop others in this A3 thinking process. If you're willing to invest the time, you'll get a proven methodology with repeatable, sustainable results.

Using A3 thinking with your team members is a way of leading and learning simultaneously. It's OK not to have all the answers and, instead, learn together, building mutual trust and respect. So, give it a try, and put your team members through the test. I promise it will make you think differently about PDCA and the A3. ■



Why You Should Share, not Present, Your A3 Report

A veteran A3 coach explains how a seemingly minor change can help foster more productive teamwork and learning.

By Eric Ethington

Most lean coaches consistently stress how the A3 process enables collaboration, drives engagement, and gets buy-in.

In that vein, I want to explore what it means to engage others and the difference between "presenting" and "sharing" your A3 report.

Every time I teach a Managing to Learn course, the issue of how to best present A3 reports comes up. "Eric, I like the problem-solving aspect, but I find A3s hard to read on the screen," people say. Or "I have to break my A3s into multiple PowerPoint slides so people can read them."

In my response, I try to steer people away from using the word "presenting," which conjures images of conference rooms with a big table, an audience scattered about the room, empty seats up front, and a projector with a screen. In that situation, you are trying to communicate your message while the others in the room multitask. It's not the best environment for engaging others.

Instead, I suggest that we think about *sharing* A3 reports. The word "sharing" brings up images of a few people actively engaged in a common goal. They are working with each other, not having someone show something to them.

Helpful to making this subtle shift is thinking of your A3 report as a small, portable whiteboard. We often discuss problems with others using an actual whiteboard — so use your A3 in the same fashion.

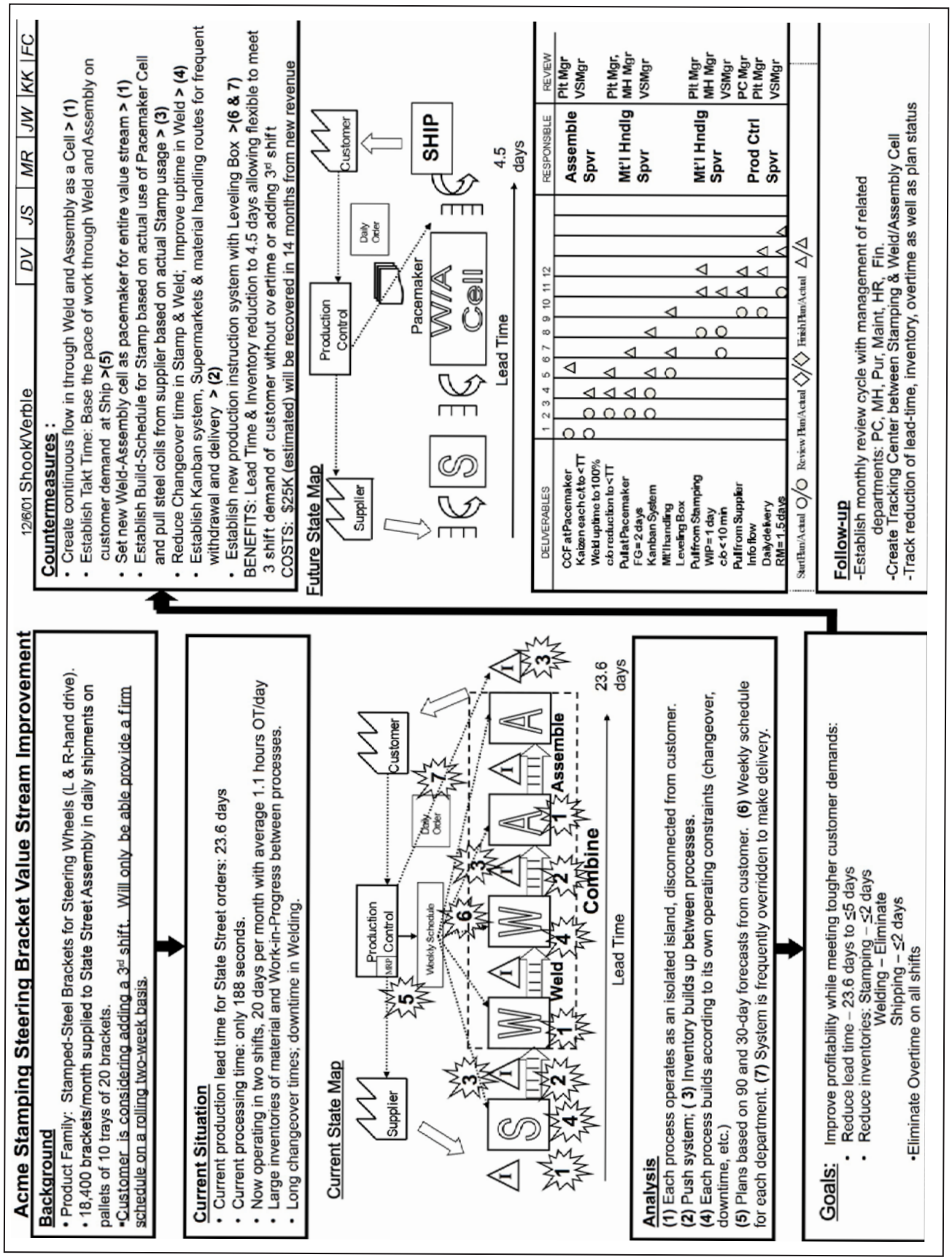
And don't wait for major milestones to engage your stakeholders. Instead, share your A3 report with them often (think "small lot" sharing). As you do this, you can take meeting notes right on the A3 document, so you don't lose what you've learned from the engagement.

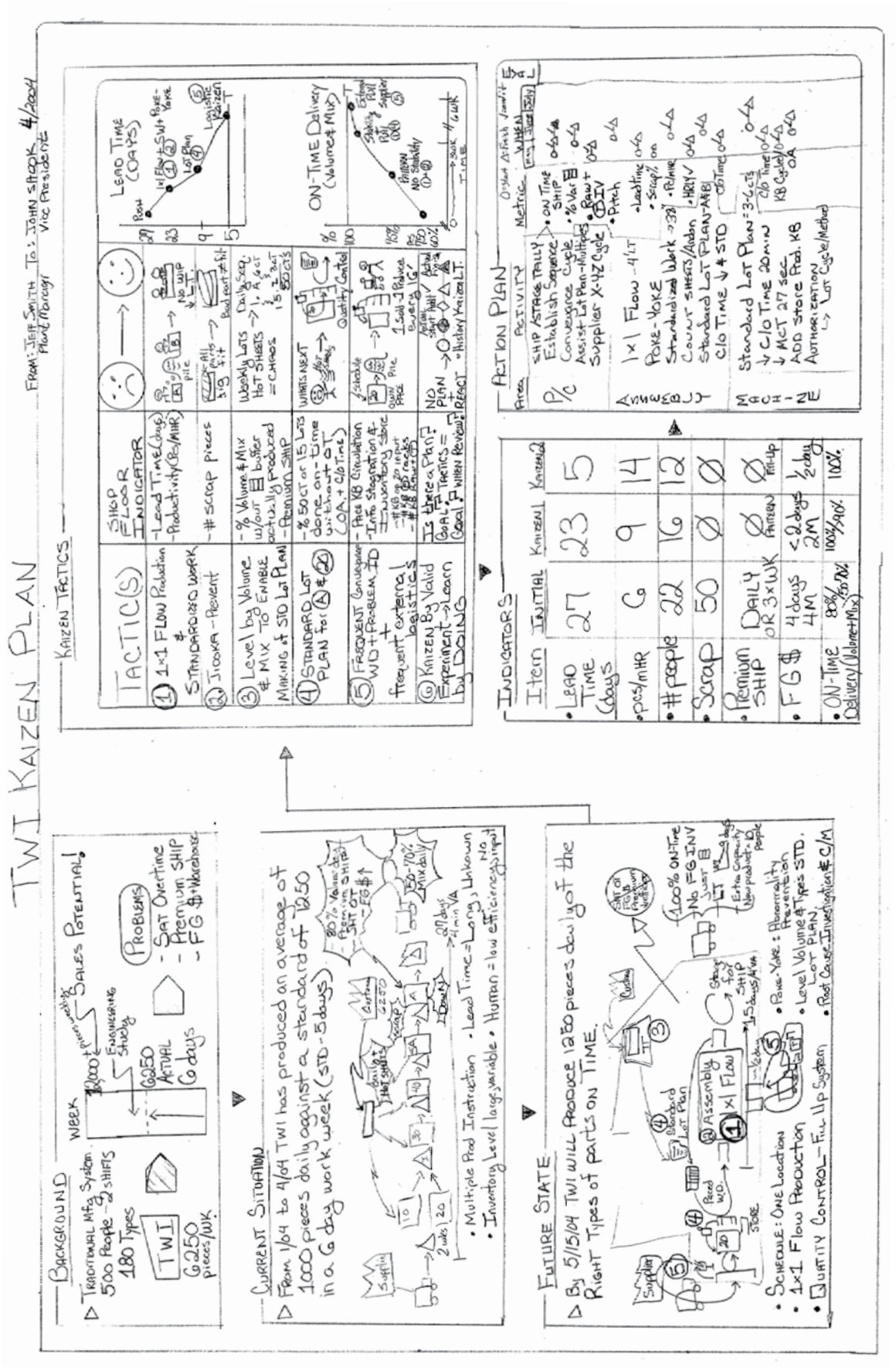
What About Achieving Consensus?

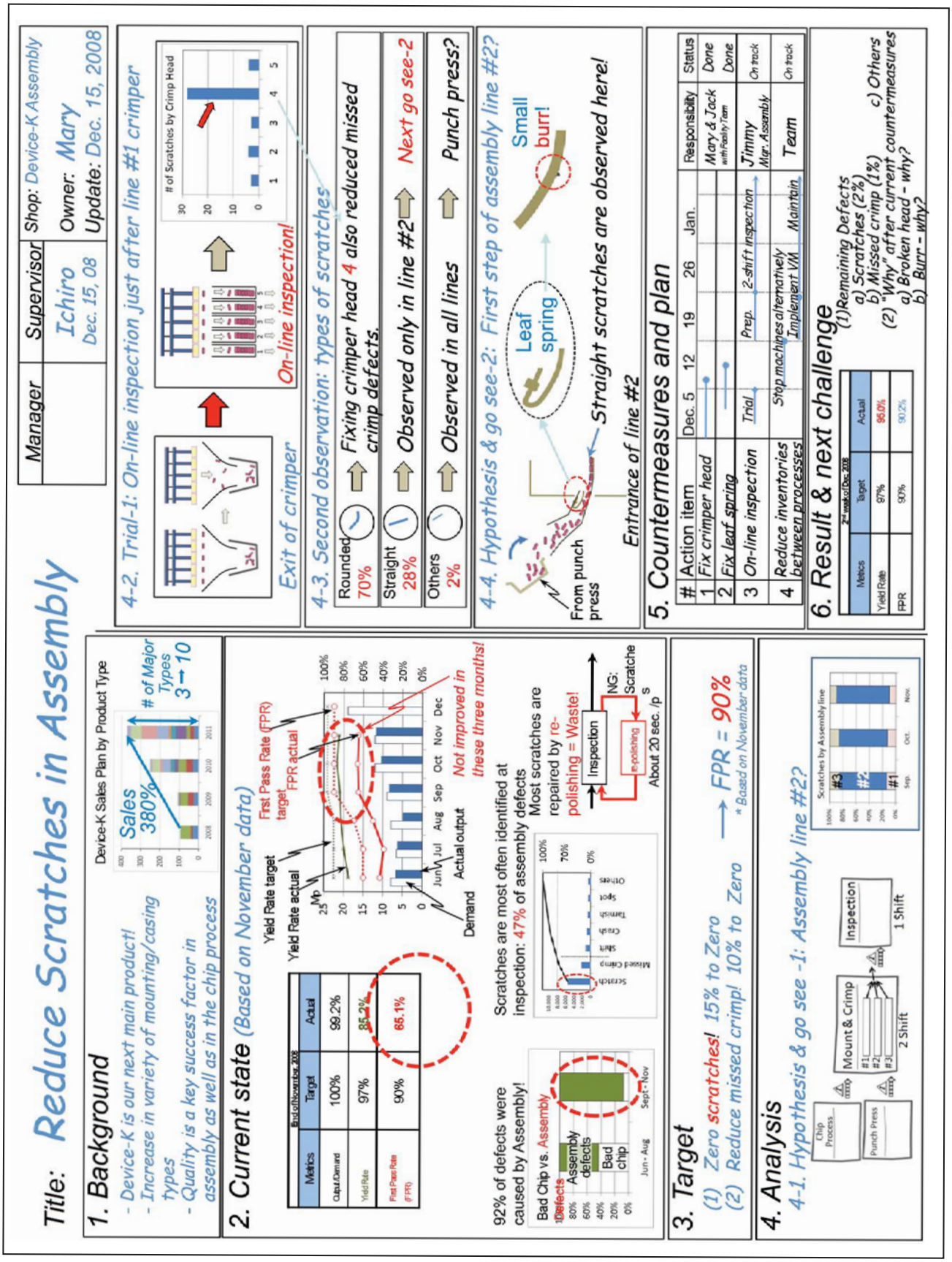
Of course, the time will come when you need to bring all the stakeholders together to ensure consensus. Then you will need to "present" your A3, but you should still think, "share." One way to share effectively in this situation is to provide a copy of the A3 report to everyone at the meeting. It's only one page (versus 30 or more for a PowerPoint deck). Then the stakeholders can look at the screen to follow your story, but they can also reference their hard copy for any details. They will naturally feel a stronger sense of ownership over something they can hold in their own hands. Also, keep one copy for yourself to write notes on as you gain additional input from the group discussion and simultaneously create meeting minutes.

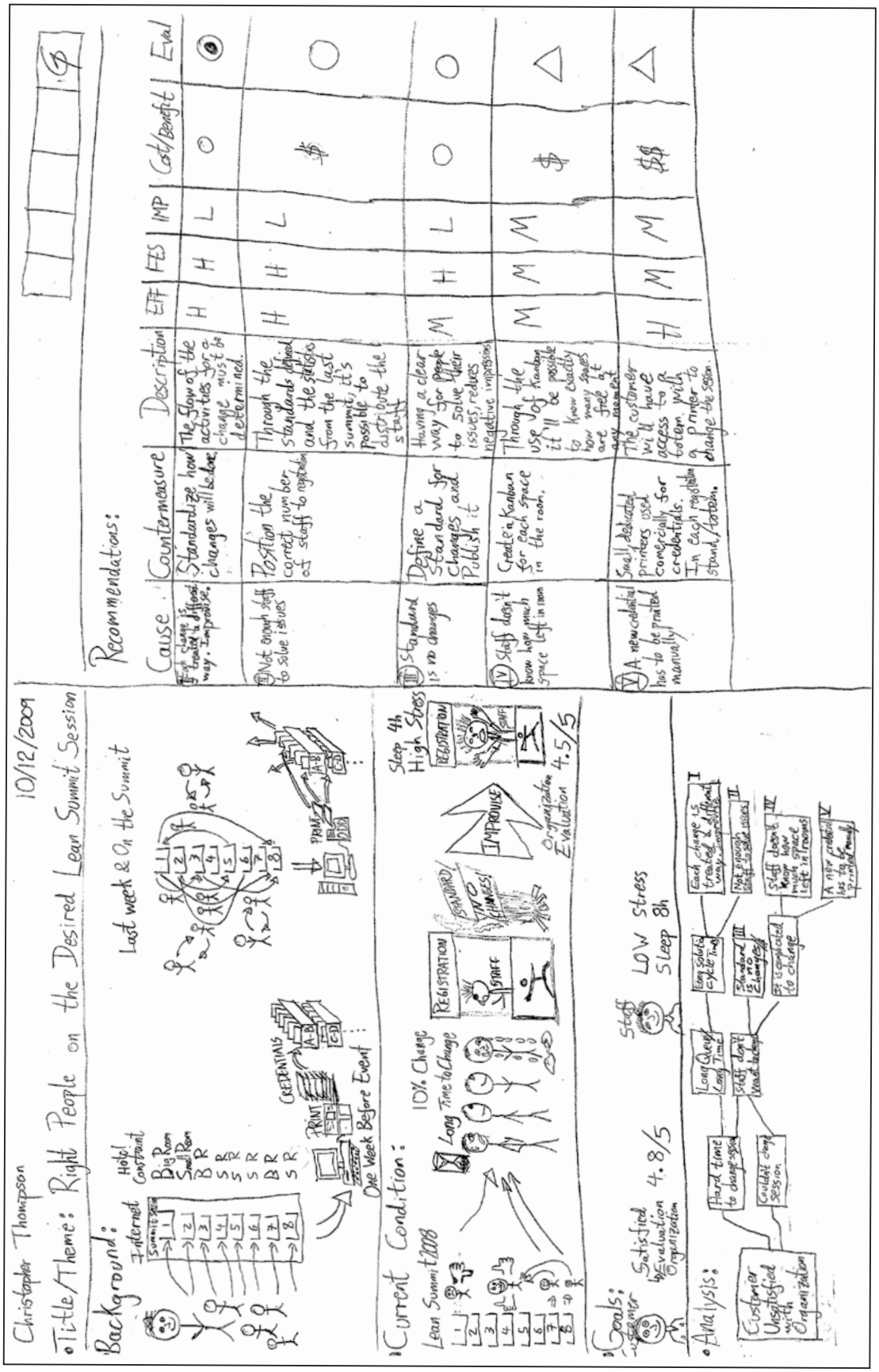
Sometimes a simple word choice can help us to see a way forward. So, don't present your A3 reports only occasionally to large groups. Instead, share them frequently with small groups of people, in small lots, using them as you would a portable whiteboard, gathering people to discuss and adding their input to the report in real time. ■

***Managing to Learn* — A3 Example #1: Acme Stamping**




TWI KAIZEN PLAN
FROM: JEFF SMITH TO: JOHN SHOOK 4/2004
Plant Manager Vice President
BACKGROUND
WEEK
TRADITIONAL Mfg System
500 People - 2 SHIFTS
180 Types
TWI
6250 pieces/WK.
Sales Potential
Forecasting Shortly
6250 ACTUAL 6 days
PROBLEMS
- Sat Overtime
- Premium SHIP
- FG $ + Warehouse
CURRENT SITUATION
From 1/04 to 4/04 TWI has produced an average of 1000 pieces daily against a standard of 1250 in a 6 day work week (STD - 5 days)
Multiple Prod Instruction • Lead Time = Long, Unknown
Inventory Level large, variable • Human = low efficiency/input
FUTURE STATE
By 5/15/04 TWI will Produce 1250 pieces daily of the Right Types of parts on TIME.
Schedule: One Location
1x1 Flow Production
Quality Control - Fix Up System
Pace-Yoke : Abnormality Prevention
Level Volume & Types STD. LOT PLAN.
Root Cause Investigation
KAIZEN TACTICS
TACTIC(S)
SHOP FLOOR INDICATOR
1) 1x1 FLOW Production
STANDARDIZED WORK
2) Jidoka - Prevent
SCRAP Pieces
3) Level by Volume # MIX TO ENABLE
Making of STD Lot Plan
- % Volume & Mix w/in Buffer actually Produced
- Premium SHIP
4) STANDARD LOT PLAN for
- % SOC or IS Lots done on-Time w/in Amount of COA + C/O TIME)
5) FREQUENT Conveyance WIP + PROBLEM ID
+ frequent external logistics
- Pace KB Circulation
- Info Stagnation & Inventory Store
6) Kaizen By Valid Experiment → Learn by Doing
NO PLAN → REACT
LEAD TIME (DAYS)
ON-TIME Delivery (Volume & Mix)
INDICATORS
ACTION PLAN
Item | Initial | Kaizen | Kaizen2
Lead Time (days) | 27 | 23 | 5
pcs/mHR | 6 | 9 | 14
people | 22 | 16 | 12
Scrap | 50 | 0 | 0
Premium SHIP | DAILY OR 3x WK | 0 | 0
FG $ | 4 days 4M | <2 days 2M | ½ day
ON-TIME Delivery (Volume+Mix) | 80% | 100% | 100%
SHIP ATTACK TALLY
Establish Sequence
Convergence Cycle
Assist Lot Plan-Multiples
Supplier X-YZ Cycle
1x1 Flow - 4 LT
Pace-Yoke
Standardized Work
Count Sheets/Andon
Standard Lot PLAN-ABI
C/O TIME ↓ 4 STD
Standard Lot Plan = 3-6 days
↓ C/O Time Down
↓ MCT 27 sec
ADD Store Prod. KB
Authorization
Lot Cycle/Method


Title: Reduce Scratches in Assembly
Manager
Supervisor: Ichiro Dec. 15, 08
Shop: Device-K Assembly
Owner: Mary
Update: Dec. 15, 2008
1. Background
- Device-K is our next main product!
- Increase in variety of mounting/casing types
- Quality is a key success factor in assembly as well as in the chip process
Device-K Sales Plan by Product Type
Sales 380%
# of Major Types 3→10
2. Current state (Based on November data)
Yield Rate target
Yield Rate actual
First Pass Rate (FPR) target
FPR actual
Demand
Actual output
Not improved in these three months!
Metrics | Target | Actual
Output/Demand | 100% | 99.2%
Yield Rate | 97% | 85.2%
First Pass Rate (FPR) | 90% | 85.1%
92% of defects were caused by Assembly!
Bad Chip vs. Assembly Defects
Jun - Aug
Sept - Nov
Scratches are most often identified at inspection: 47% of assembly defects
Most scratches are repaired by re-polishing = Waste!
Inspection
re-polishing
NG: Scratches
About 20 sec. /pcs
3. Target
(1) Zero scratches! 15% to Zero
(2) Reduce missed crimp! 10% to Zero
→ FPR = 90%
* Based on November data
4. Analysis
4-1. Hypothesis & go see -1: Assembly line #2?
Chip Process
Punch Press
Mount & Crimp
Inspection
2 Shift
1 Shift
Scratches by Assembly line
4-2. Trial-1: On-line inspection just after line #1 crimper
Exit of crimper
# of Scratches by Crimp Head
On-line inspection!
4-3. Second observation: types of scratches
Rounded 70%
Fixing crimper head 4 also reduced missed crimp defects.
Straight 28%
Observed only in line #2
Next go see-2
Others 2%
Observed in all lines
Punch press?
4-4. Hypothesis & go see-2: First step of assembly line #2?
From punch press
Leaf spring
Small burr!
Straight scratches are observed here!
Entrance of line #2
5. Countermeasures and plan
| Action item | Dec. 5 | 12 | 19 | 26 | Jan. | Responsibility | Status
1 | Fix crimper head | | | | | | Mary & Jack with Facility Team | Done
2 | Fix leaf spring | | | | | | | Done
3 | On-line inspection | Trial | | Prep. | 2-shift inspection | | Jimmy Mgr. Assembly | On track
4 | Reduce inventories between processes | Stop machines alternatively | | | Implement VM | Maintain | Team | On track
6. Result & next challenge
(1)Remaining Defects
a) Scratches (2%)
b) Missed crimp (1%)
c) Others
(2) "Why" after current countermeasures
a) Broken head - why?
b) Burr - why?
Metrics | Target | Actual
Yield Rate | 97% | 96.0%
FPR | 90% | 90.2%



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Managing to Learn — A3 Example #5: Acme Stamping from *Understanding A3 Thinking*

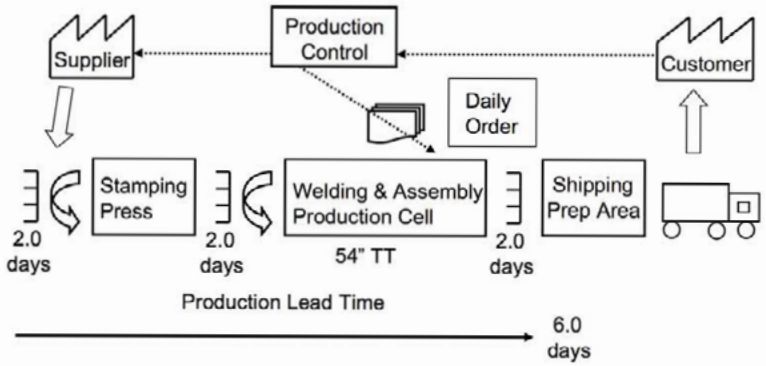
Acme Stamping Steering: Lead-time & Inventory Reduction Project Status Review

3/6/02

Background

- Stamping division goals require reductions in lead-time, and inventory of 25% this fiscal year.
- Bracket value stream was a push style of operations with long lead-time, excess inventory, over-production, and poor on-time delivery performance.
- A project was initiated to improve in these dimensions targeting full completion by June 2002.

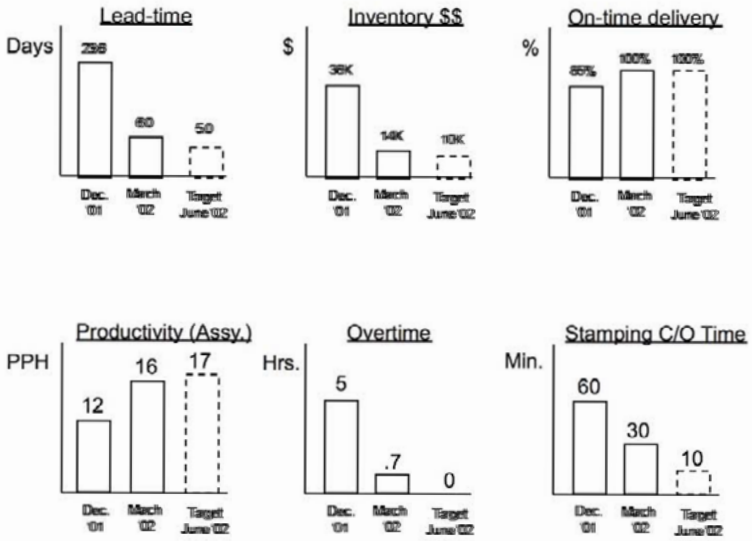
Current Condition – March 2002



Key Concepts Implemented:

1) Conversion to an improved flow of operations
2) Establishment of supermarkets for Raw, WIP, & FG inventory
3) Creation of replenishment style pull system with kanban signal
4) Creation of a pacemaker cell combining welding & assembly
5) Pacing of all work to takt time and hourly count boards
6) Creation of detailed standardized work for welding and assembly cell
7) Leveling of the production schedule in terms of type and quantity
8) Reduction of changeover time at stamping
9) Reduction of lot sizes in stamping

Results



Remaining Issues / Action Items

Category	Remaining Problem	Counter-measure	Responsibility & Due Date
Lead-time	.5 days over goal	Reduce stamping WIP	PC by 5/30
Inventory	$4K over goal	Purchase parts market	PC by 5/30
Delivery	N/A	Maintain performance	Operations
Productivity	1 PPH under goal	Eliminate overtime	Ops. By 5/30
Overtime	.7 Hours over goal	Eliminate minor stops	Maint. By 5/30
C/O Time	20 min. over goal	Reduce internal work	Eng. By 5/30

***Managing to Learn* — Detailed A3 Template**

Title: What change or improvement are you talking about?

Owner/Date

1. Background: What are you talking about and why?

What is the purpose, the business reason for choosing this issue?

What specific perfomance measure needs to be improved?

What is the strategic, operational, historical, or organizational context of the situation?

2. Current Conditions: Where do things stand now?

What is the problem or need—the gap in performance?

What is happening now versus what you want or needs to be happening?

Have you been to the gemba?

What facts or data indicate there is a problem?

What specific conditions indicate that you have a problem or need?

Where and how much? Can you break the problem into smaller pieces?

→ Show facts and processes visually using charts, graphs, maps, etc.

3. Goal: What specific outcome is required?

What specific improvement(s) in performance do you need to achieve?

→ Show visually how much, by when, and with what impact.

→ Don't state a countermeasure as a goal!

4. Analysis: Why does the problem or need exist?

What do the specifics of the issues in work processes (location, patterns, trends, factors) indicate about why the performance gap or need exists?

What conditions or occurances are preventing you from achieving the goals?

Why do they exist? What is (are) their cause(s)?

→ Use the simplest problem-analysis tool that will suffice to show cause-and-effect down to root cause. From 5 Whys to 7 QC tools (fishbones, analysis trees, Pareto charts) to more sophisticated SPC, 6 Sigma, and other tools as needed.

→ Test the cause-and-effect logic by asking "why?" downward and stating "therefore" upward.

5. Recommendations: What do you propose and why?

What are the options for addressing the gaps and improving performance in the current situation?

→ Always start with two or three alternatives to evaluate.

How do they compare in effectiveness, feasibility, and potential disruption?

What are their relative costs and benefits?

Which do you recommend and why?

→ Show how your proposed actions will address the specific causes of the gaps or constraints you identified in your analysis. The link should be clear and explicit!

6. Plan: How will you implement? (4Ws, 1H)

What will be the main actions and outcomes in the implementation process and in what sequence?

What support and resources will be required?

Who will be responsible for what, when, and how much?

How will you measure effectiveness?

When will progress be reviewed and by whom?

→ Use a Gantt chart (or similar diagram) to display actions, steps, outcomes, timelines, and roles.

7. Followup: How will you ensure ongoing PDCA?

How and when will you know if plans have been followed and the actions have had the impact planned and needed?

How will you know if you meet your targets?

How will you know if you reduced the gap in performance?

What related issues or unintended consequences do you anticipate?

What contingencies can you anticipate?

What processes will you use to enable, assure, and sustain success?

How will you share your learnings with other areas?

Faculty Highlight

John Shook

Chairman, Lean Global Network
Senior Advisor, Lean Enterprise Institute

John learned about lean management while working for Toyota for 11 years in Japan and the U.S., helping it transfer production, engineering, and management systems from Japan to NUMMI and other operations around the world. While at Toyota's headquarters, he became the company's first American kacho (manager) in Japan. In the U.S., John joined Toyota's North American engineering, research and development center in Ann Arbor, Michigan, as general manager of administration and planning. His last position with Toyota was as senior American manager with the Toyota Supplier Support Center in Lexington, Kentucky, helping North American companies adopt the Toyota Production System. John coauthored *Learning to See*, the book that introduced the world to value-stream mapping, *Kaizen Express*, a bi-lingual manual of the essential concepts and tools of the Toyota Production System. With *Managing to Learn*, John revealed the deeper workings of the A3 management process that is at the heart of Toyota's management and leadership.

David Verble

Lean Coach, Lean Enterprise Institute
Partner, Lean Transformations Group

A performance improvement consultant and leadership coach since 2000, David has been an LEI faculty member for 17 years. Recognized as one of the first Toyota-trained managers to bring A3 thinking from Japan to the United States, he has conducted A3 problem-solving and leadership programs for 30 years. As part of his coaching more recently, David helps leaders build stronger teams by encouraging them to focus on the work environment created by their leadership behaviors. Additionally, he works to help leaders and coaches encourage employee problem-solving through Humble Inquiry skills of intentional listening and respectful questioning.

David gained his expertise working for Toyota in North America for fourteen years, first as an internal change agent and later as a Manager of Human Resource Development at the plant and North American levels. He also has a graduate degree in instructional systems and performance technology and additional training in process consulting and coaching psychology.

Faculty Highlight

Eric Ethington

Senior Coach and Chief Engineer, Lean Product and Process Development
Lean Enterprise Institute

President, Lean Shift Consulting

Eric is a recognized expert in process development and problem-solving methodologies with over 30 years of industry experience in frontline-through-executive leadership roles at Delphi and Textron and 12 years of consulting practice. His experience in applying lean includes most types of industries and functional areas, including organizations as varied as Medtronic, Michigan Medicine, Coca-Cola Enterprises, and Goodwill.

As LEI's chief engineer, process and product development, Eric leads the development of learning experiences that enhance design professionals' lean development knowledge and capabilities while advancing the discipline's body of knowledge.

Eric holds a Bachelor of Science in Industrial Engineering from General Motors Institute (now Kettering University), a Master of Business Administration from the University of Michigan-Flint, and a six-sigma black belt in design.

Additionally, he is the coauthor of *The Power of Process, a Story of Innovative Lean Process Development* (2022).

Tracey Richardson

Instructor, Lean Enterprise Institute
Co-Owner, Teaching Lean Incorporated

Tracey has over 29 years of combined experience in various roles within Toyota and learned lean practices as a group leader at Toyota Motor Manufacturing Kentucky from 198 to 1998. She was one of the first team members hired, with the fortunate opportunity to learn directly from Japanese trainers. As a group leader and quality circle advisor, she learned firsthand about lean tools and culture development.

For the last 19 years, as president of Teaching Lean, Inc., Tracey has worked with Toyota North American plants and other companies on their lean journeys, helping them develop employees' capabilities, including team members and company leaders. Using problem-solving and aligning daily activities with company business plans, she assists clients in creating lean cultures that are the foundations for long-term sustainability.

Tracey is an active coach and contributor to LEI's *Lean Post,* teaches several problem-solving and A3 courses as an LEI faculty member, and is coauthor of *The Toyota Engagement Equation (2017).*

Lean Enterprise Institute
lean.org

About The Lean Enterprise Institute

The Lean Enterprise Institute, Inc., was founded in 1997 by management expert James P. Womack, PhD, as a nonprofit research, education, publishing, and conferencing company. As part of its mission to advance lean thinking around the world, LEI supports the Lean Global Network (leanglobal.org), the Lean Education Academic Network (teachinglean.org), and the Healthcare Value Network (healthcarevalueleaders.org).

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The Lean Enterprise Institute (LEI) offers a wide range of learning resources, all with the practical knowledge you need to sustain a lean transformation:

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Education

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