

## MITOCW | Ses. 3-4: A3 Thinking

The following content is provided under a Creative Commons license. Your support will help MIT OpenCourseWare continue to offer high-quality educational resources for free. To make a donation, or to view additional materials from hundreds of MIT courses, visit MIT OpenCourseWare at [ocw.mit.edu](http://ocw.mit.edu).

**ANNALISA L. WEIGEL:** I know we've had a very exciting morning so far. We've been talking about the accounts payable case study at Rockwell Collins. Our next module on A3 thinking is going to take that setting of the case study that we used, and we'll launch an A3 planning exercise from that scenario.

Before we do that, I just want to give you a little bit of background on A3 as a tool. So in this module, we expect you to be able to do two things at the end. First is to recognize that A3 is not just a tool but really is a way of thinking, a way of trying to solve a problem in a very structured way. And secondly, we want you to gain a little bit of practice with using the tool of an A3 chart as a standard tool for implementing lean projects.

All right. So first of all, A3 is really a tool for enabling our whole PDSA or PDCA cycle. And this is a snapshot of one particular version of an A3 tool up in the corner. So as we said in the goals for our module here, A3 is not just a tool, but it is also a way of thinking.

It originally evolved as a management process from Toyota. And it's named for the A3 size sheet of paper, which is roughly 11 by 17. And it was chosen as the form for this particular exercise, because it is the largest piece of paper that can fit through a fax machine in Japan. So you could contain all the information you needed on that one page, and it was still easily translatable to anywhere else, because you could put it in a fax machine and someone at the other end would get it and be able to see the whole description of your problem and your courses of action presented on that one piece of paper.

So here is in more detail an example of an A3 sheet that was developed at Toyota. You can see on your tables we have some starts of an A3 sheet for the Rockwell Collins case study. And they're also blown up here very largely on the butcher paper that's around the room.

And they're broken down into several sections. And I just want to spend the next couple of slides walking you through the basic purpose of an A3 and the different sections of it. And I really have to thank Susan for giving us this great introduction to A3 as a tool in her talk that happened earlier. And she showed you some excellent examples of what these actually look like when they're created.

So first, at the top you want to start with a title. What is it that you're talking about? What is the focus of your problem investigation? Then there's some background on why you're talking about it and the particular business context for the problem you're examining.

Then more detail on the current situation. And you saw in Susan's representation some great pictures and diagrams. Pictures can be worth a thousand words. They're very helpful in communicating that. Sometimes a picture and some couple of phrases of text may be all that you need.

Then there's some analysis usually done, trying to get at, really, what's the root cause of the problem you're seeing, requirements, constraints, or alternatives that have to be considered. And then lastly down here, although it's sliding off the page, is the goal. So what's the specific change that you want to accomplish now?

So this is called the left-hand side of the A3. And then over here on the right-hand side starts up with your recommendations. So what's your proposed countermeasures to remedy the root causes that you've identified over here and get to your goal?

Then a plan for how you're going to implement those recommendations, and who's going to do what and when, and then some follow-up. So how will you know if the actions that you're planning really have the impact that you expected they do? And this not only lets you know that your actions have been successful, but it also confirms that your understanding of the problem was right. Because of what you thought was going to happen happened, that's a good reinforcement for it.

All right. So we just want to stress again that the thought process used in A3 thinking-- thinking about the context, analyzing the problem, figuring out root causes, setting a goal, thinking about your steps to then remedy it-- it really is a thought process, it's not just a tool. And sometimes you hear people talking about A3, and sometimes it feels like they get lost in the tool and they've somewhat forgotten about the process.

Another important attribute of this, it really is collaborative. Everybody should get around an A3 sheet. It's small enough so you can all see what's going on, and it lets people who are all part of the solutions get together to figure out how to solve the problem.

It promotes very logical and objective thinking. We stress having data on your A3 sheet in your description of the situation and in the analysis. It lets you think about the results and the process that you might take to try to meet some of your objectives. It forces you to be synthetic about the problem you're thinking about, because you only have one A3 page to write it on. So you've got to be able to understand your problem well enough, distill it well enough, that you can convey it in a nice, contained space.

It forces alignment between the context of the situation, the problems you're seeing, the root causes of those, the goals that you want to achieve, and the actions that you're going to take to make that happen. Those all have to be aligned. And you can see that in the A3 sheet.

Then as a result, you have some coherence, both within and consistency across all these elements in your A3 sheet. And it really makes sure that you take a systems perspective on the problem to get out of those silos.

So just a little bit more information about each section of the A3. So we'll start with what's typically on the left-hand side-- the background, the current situation, analysis, and goals. Diagrams are very useful and efficient for communicating in small spaces like that.

And on Susan's examples of A3, you saw a lot of diagrams. Value stream maps were shown up in the current situation, which showed the items of interest, the process flow between them. It showed you some data on that, and then identified those cloudbursts of areas where there were problems.

So some useful questions to ask as you start to put together the left side of the sheet. Are the activities clearly specified with regards to the content, in order, and intended outcomes as you work through the current situation analysis and goals? And are the connections between all the entities that are involved in your A3 problem very clear and explicit?

So now, moving over to the right-hand side of the A3 sheet-- thinking about recommendations and plans. When you're thinking about recommendations, you really want to make sure that they're directly addressing the root cause. So there has to be consistency between that part of your A3 sheet and where you describe the root causes taking place. And they really should help you evolve your process from the current state towards something that you see as an ideal state by eliminating some of the root causes.

And then in the plan section, that's where you're going to define the steps to correct each of the root causes-- so, again, traceability and connectivity, back to that. And in the process of doing so, you have to identify who exactly is responsible for what, and when, and exactly what it is that they're going to do.

And then the last part of the A3 sheet is really the continuous improvement part of it. This is your follow-up activities. So how do you know that what you wanted to happen, happened? And make sure that when you're thinking about what you're going to look at in the follow-up section, that links back to your original goals for this, and the criteria and metrics that you set up for that.

So we have an example here in the module. Susan has already teed up a lot of great examples. And you're going to be going through one in your exercise. So I don't think I want to spend much time on this particular example. This happens to be from Acme stamping steering bracket value stream improvement exercise.

And just to show you the breadth of situations across which A3 thinking can apply, you see one here for manufacturing process. We saw lots for health care from Susan. And now we're going to go and do one in the office area and accounts payable. So really, there's no limit to the context in which you can apply A3 thinking, because it's really all about structured problem solving.

What I will note before leaving this example is the prevalence of the visual types of information. So they have their current state map, a future state map on here, a Gantt chart that they have used to describe their plan, which are all the deliverables that have to happen, and who is going to do them, who's responsible for them, and when. So you can see how these visual representations pack a lot of information into a nice, tight space.

Further examples-- we may have come across this in our New Balance video. I can't recall exactly. But when you go into the New Balance plant for sure, you see these-- they're actually whiteboard-sized, so a little bit large. So you can actually have people with markers writing on them.

This is an A3 chart. And it's up around the factory floor. So that's an incredibly powerful boundary-spanning object. And all the workers in a cell can get together around their A3 board and strategize about problem solving. And here's an example where they've written up in this section their root cause analysis. And they chose to do a five whys to get down to their root cause.

And it's just wonderful to see this being used right on the factory floor. And it's quite powerful to have that there right in front of the station where everybody is doing their work. So it's not kept by somebody else in a desk drawer somewhere. It's just up front and visual.

All right. So now let's move into our exercise for this module, which is taking the Rockwell Collins accounts payable case study. And we're going to use that to create an A3 sheet on what we should do to try to solve some of the problems that Rockwell is encountering. So on your table, you'll each have a small size of these so you can refer to it. And then each of the groups has a larger version up on the easel charts.

So each of the tables is going to be working with a group. And you're going to develop an A3 plan which responds to question 8 in the case study, which is, "Suppose you are the RPI team leader and have to report back to Joanie. What will you recommend?"

So we'd like you to spend about 20 minutes preparing with your team at the table an A3 plan. All right. And we've given you the template that you can use to fill that out. So first, we have to remember what the constraints are. I'll detail those in the next slide.

You should also consider what Rockwell Collins groups should participate in this rapid process improvement team. So make sure you think about all stakeholders. Then you'll want to verify that the information we've provided to you on those sheets is correct. Complete the additional information blocks that are in the template. And you can use some of the Post-It notes on the large A3 to draft the different elements that you want. And then you can record your final recommendations on the large A3 sheet.

And at the end of the class, we'll have some table tours where you can walk around and see what your different colleague teams have produced for their plans. And then we'll have a discussion and compare and contrast some of the strategies that you thought about in this context.

So just very briefly, the management constraints as we pulled from the case study are these. So remember, your main objective is to reduce cycle time, going for a goal of invoice resolution in less than 10 days. But shorter than that is even better.

Management wants to establish a training program for everyone that's affected by the change. They'd like to formalize communication requirements for invoice payments with suppliers. Changes have to be accomplished within the current system. So there's no purchasing new IT systems to actually solve the problem. And also, to use already available in-house software or IT technology. Those sort of go hand in hand.

Any action items that might be addressed in your A3 plan have to be completed within 30 days. And there can't be any additional staff. So an outcome of your A3 can't be, "let's hire five new people." That wouldn't be acceptable.

All right. So I'm going to leave the management constraints up here on the projector so you can see them as you're working through your problem solving activities. And we'll ask each table to get started. We'll have the instructors in the class walking around to answer questions and help you through the process.

So take about 20-- yeah, 20 minutes. So I'll give you a 3-minute warning when we get to the end of that time period.

**PROFESSOR:** Could someone suggest what might be one of the things you're going to have to do to implement these recommendations? Just one thing.

**AUDIENCE:** Cross-training.

**PROFESSOR:** Cross-training, OK. Let's just take cross-training, OK? So you're going to have some kind of recommendation on training. How's that going to-- who's going to do that? When's it going to get done in the sequence of things?

I find a useful way to think about this is that maybe think of each of you as one of the stakeholders in the organization. Maybe you're the mailroom guy, and Celeste, maybe you're the accounts payable person. And think about what would be done in your area to implement this. Maybe you're a vendor.

So you've got to change your mind now. Don't go back and redo the whole problem. We spent all morning doing that. Think about, we've got to implement it. And you've got to come back to Joanie. And [INAUDIBLE]?

**ANNALISA L.** Yes.

**WEIGEL:**

**PROFESSOR:** OK. So focus on this task.

**AUDIENCE:** This is change billing address.

**AUDIENCE:** Yeah. And the next thing we need to do is we need to--

**AUDIENCE:** Who does that? Who does that?

**AUDIENCE:** Yeah.

**AUDIENCE:** Who does it?

**AUDIENCE:** Who changes the billing address?

**AUDIENCE:** Purchasing. Because [INAUDIBLE].

**AUDIENCE:** Purchasing.

**AUDIENCE:** Yeah. Purchasing, yep.

**AUDIENCE:** Simply from the sheer magnitude, I would say to get the five Xs on the end of the invoices on the outside of the company would reduce a massive amount of letters coming in, number one. And while that's being done, it allows us to train some of the people inside the company to implement the next few steps.

**AUDIENCE:** So use local companies for faster turnaround.

[INTERPOSING VOICES]

**AUDIENCE:** They just do-- they just throw out the Xs. We got that.

**AUDIENCE:** The call center needs to be trained.

**AUDIENCE:** In what?

**AUDIENCE:** How to use--

**AUDIENCE:** IT has to be aware--

[INTERPOSING VOICES]

**AUDIENCE:** IT needs to-- yeah.

[INTERPOSING VOICES]

**ANNALISA L. WEIGEL:** All right. So what we'd like to do at this point, recognizing that not all the implementation plans are finished and that's OK, is we'd like to go around the room around the tables and have you share with us where you are in your implementation plan and what you've come up with so far. Try to limit your summary for us to 60 seconds or less.

I'm going to ask to start with the table in the front, and we'll go around the room.

**AUDIENCE:** OK. So thinking about the three different decisions, we have purchasing, the mailroom, and accounts payable. So the one who will be doing the training, probably the senior management, talk to the main leaders in each group. And we want to train at the same time, because [INAUDIBLE] scheduling issues have the purchasing group trainers have to add the Xs. But now we're going to train them to recognize the Xs. And then they have to be able to train them in document imaging.

And then after the simpler steps, and then in the future, create a call center within the mailroom to train the staff [INAUDIBLE].

**ANNALISA L. WEIGEL:** Very good, thank you. So let's go around to the next group. And you can tell us what you thought about.

**AUDIENCE:** We focused on the implementation of the labeling of-- the first one we had five Xs to the [INAUDIBLE] of our invoices. And the way we're going to do this, we're going to have a small meeting where we have a representative from the mailroom, and a representative from purchasing, as well as one of us who came up with all these ideas, sit down together and decide what the format needs to be of this addition.

It could be that some suppliers' names or some, whatever in the address block, would be too big, and you would never actually see the Xs because they would move off-- the little window in the envelopes. So we just have to decide what exactly the format, the best lettering would be to add on. Five Xs may not be the best.

Once we know what we want to put on, we pick one of our medium-sized suppliers-- we picked Ben & Jerry's for obvious reasons-- and set up a meeting with them. Again, we would have a purchasing rep, we'd have the mailroom rep there, but also the supplier rep to hopefully bring the ice cream. And then we would talk to-- just talk them through the whole process and just make them aware of the whole situation.

They don't really have to do anything if we have purchasing implement the whole solution. But they need to be aware [INAUDIBLE] are also the random letters on the orders.

Actually, I never mentioned this. We were thinking about purchasing when the order gets sent initially, that purchasing actually, when they type in the order, that they would add the tag as opposed to the supplier. They would add the tag and then the supplier would just see the letters, wouldn't have to add them. And then just watch how well it goes.

**ANNALISA L. WEIGEL:** OK. All right. Let's go around to the next table.

**AUDIENCE:** So we tried to introduce a vendor pilot for-- using a vendor pilot for our suppliers, so add a XXX and a PFR. We started with a pilot model, maybe one or two suppliers, and then scale up if, depending on the success, or introduce some little modifications as need be, before we expand for the PFR.

And then much of our-- we talked about the IT work on the scanners. And then we'd also have to train staff on the document imaging, so be able to use the scanners. And then we also talked about training. But the Lotus Notes, we realized that that was the point where when one staff member is away, others cannot do her function, his/her function, take her place.

So we thought of training our analysts to be able to use the Lotus Notes so that even when one person is away, other people can fill in the space and work-- could go on that way. So that's what we came up with.

**ANNALISA L.** Great. Thank you. So all very three different ideas. This is great. Go ahead, next table.

**WEIGEL:**

**AUDIENCE:** We spent most of the time talking about the process of scanning documents into the system, and who would be doing it. We talked about whether we could have a rotating analyst, in which case-- because they would have knowledge of what the different needs are, or whether we would do someone from purchasing or from [INAUDIBLE], and probably having a meeting to talk about that within the group would be the best way.

And then when you would have to train people to use the Lotus Notes, and also doing the scanner, and the outcome would be that all the documents are scanned, and you would have some cross-training ability so that, kind of as mentioned previously, if one person's out, you still would have the work done.

**ANNALISA L.** OK. Last table.

**WEIGEL:**

**AUDIENCE:** We talked a lot about the process of putting the tags onto the addresses and used a similar idea to that table of the pilot. We wanted to start with like one person from purchasing, and training them and adding to the tags. And [INAUDIBLE] local company or a couple of local companies to add it to, just so that we could be sure that we actually got the invoices before the end of our 30-day period.

And then also, train all the mailroom on that first day about what to expect, because they'd start seeing those Xs [INAUDIBLE] we can't guarantee that one versus another person would see them. And then we also talked a bit about what the analysts had to do regarding what exactly they need to know to no longer check for PFRs, because that's going to be a bit tough-- it's not very clear-cut time when those will stop coming in.

Also, we discussed how to find the new images after the document is scanned, instead of on the microfilm. So that was the [INAUDIBLE]. Anything else I'm missing?

**ANNALISA L.** OK. Excellent. Well, these are all very good starts to the implementation plan. It's fascinating to see the different ways that your groups approached them and which aspects you thought you wanted to start on, as well as level of details that some of your groups thought about. A lot of great transition issues are raised and how you implement lean kinds of new programs that you're thinking about.

**WEIGEL:**

So this group talked about training. A number of you talked about training, the importance of that. And if you don't provide training, efforts can fail before you even begin.

And this group talked about some staged rollout, as did other groups. So let's do pilots-- test a little bit, see if it works. And then if it does work, then we can deploy it on a larger scale, and if it doesn't we will find that and test a little bit more before we get success and then go out. Also an excellent attribute of trying to implement a big change like that.

What really happened in Rockwell Collins? Are you curious?

[INTERPOSING VOICES]

**ANNALISA L.** Right. OK. So they implemented the recommendations. And it didn't work. They weren't seeing any change in their performance metrics. What do you think was happening?

**WEIGEL:** Any guesses? I don't expect you to know. I don't expect you to have a right guess, but.

**AUDIENCE:** Too much change at once?

**ANNALISA L.** Too much change? Yeah, what else?

**WEIGEL:**

**AUDIENCE:** They just didn't understand what was going on.

**ANNALISA L.** They didn't know-- that's pretty much accurate. So what happened was the analyst said, oh, you've got a new system? Well, I don't like this new system. I don't know this new system. I'm not going to follow this new system.

**WEIGEL:**

And they started calling all their contacts and saying, look, you know, they've implemented this new system, but forget about it. If you have a problem, just give me a call directly. And they just totally subverted all the systems that were put in place, largely because they didn't understand that the document imaging and Lotus Notes was going to be useful for them.

So Rockwell said, all right. You know what, we'll just-- we'll back away from this, and we'll do this sort of in a staged deployment method. So they just got the analysts trained up and comfortable on the document imaging to see that was useful. And then when that happened, then they went to their pooled queue calling center and then initiated that.

So it took a little while, but they eventually got it. But the implementation was challenging because of these issues that very perceptively were raised just about, human nature and organizational natures when we come into big change problems. Yes.

**AUDIENCE:** So how does the culture of organization play a role in implementation of recommendations?

**ANNALISA L.** It plays a huge role, right? I mean, we've kind of been alluding to this over the course the last couple of days.

**WEIGEL:** And some cultures and the way that they operate are going to be more amenable to change-- that may be part of their culture-- and accepting of it. And others are not going to accept change so much.

And you have to really recognize which one you're in so that you can approach any kind of change effort in a way that's going to make sense to the organization that you're in and be productive as a result. But it's a really big topic, and longer than we have time to address in a quick question here. But we can talk about it during the break.