MITOCW | Ses. 1-3: Lean Thinking: Part I

HUGH MCMANUS: Earl introduced to you the concept of Lean and made the assertion that lean isn't so much a collection of tools as a way of thinking about things. So what we're going to do now, actually, in two parts, one before lunch, one after, is introduce you to the basics of that way of thinking. So that's why we call this module Lean Thinking.

What we're going to do first is talk about processes. And if Lean thinking has one really important component, if you walk away from here with one idea in your head, it's to think about work as a process which can be improved, so we're going to spend a little bit of time thinking about what is a process, how can we think about processes, how can we map processes, how can we create visual representations of them, and how we can think about value in that context.

We're going to look at the fundamental Lean principles of Womack and Jones, which are essentially how can we think about improving the process in kind of an organized way. And then we're going to walk through a set of tools which, over the course of the next couple of days, we will dive deeper into. For now, with the exception of mapping, which we're actually going to do in some detail, we'll walk through the tools relatively quickly just to sort of give you an introduction to them. Again, those will be reinforced as the course goes on.

So what do we mean by a process? Simply put, it's an action or a series of actions that transforms something. We have an input, some kind of process that transforms it into an output. If we want to expand the definition a little bit more, we can also think about where the inputs come from.

A manufacturing-derived terminology is suppliers. That's actually kind of dangerous because in a service thing, that may actually be the customer that has a request, or it may be somebody else. It may not necessarily be a supplier in the material sense. But there is a place where the inputs come from, a set of defined inputs, instead of defined transformations, and the outputs go to a customer.

So let's talk about a customer a little bit. What happens to the outputs of a process? They go to a customer. Again, just like supplier, the terminology, we've got to be careful not to get too hung up on. Customer may be customer in the sort of retail sense, somebody who buys something. Or it may be somebody else who gets value out of the process. So external customers are really that retail customer. The customer is the people who pay for the process to take place. They may or may not be the end user.

There are plenty of examples in the aerospace business, for the engineering side of the room, of customers, for example, government acquisition, the people who buy things are not the people who use them. So there's even there a distinction between the purchasing customer and the end user customer.

In addition, in many complex processes, you may actually be working for an internal customer. So a given step in a more complicated process may actually be working for somebody inside the organization. A classic case of that in aerospace engineering operations. Sometimes you do engineering for outside customers. Most of the time you do it for customers within your organization.

In the health care side, there's an awful lot of service provision which are not directly affecting the patient but that are necessary, say, to keep the hospital going. So thinking about customers with a little bit of nuance is necessary.

The other thing that we want to make sure we don't get too caught up in the words is the fact that our customers also often provide some of the inputs to our process. So actually, in a classic retail transaction, the customer has a need, which is an input to our process, as well as being the ones who receive the output of the process.

So how do we visualize a process? Very general question. A good method is process mapping, is to try to get our brains wrapped around what goes on inside our work process through a simple map. There's a couple of examples here. This one is close to my heart. This is an aerospace engineering drawing release process. This is a before Lean. It's actually, from an engineering point of view, a simple process. But when you map it out in the sort of legacy state, it doesn't look so simple. In fact, it looks very confusing.

And this is near and dear to my heart because I spent 10 years working in that box. You can't read it. That's stress analysis. And notice that's the one that all the lines come in and out of. So the task actually turned out to be very simple there, but the interactions with the rest of the process were very confusing in the old, pre-Lean state.

Here, interestingly, is a before picture, and Earl can probably comment on this a little more, for heart attack treatment. This one doesn't look too bad compared to that one. It's sort of more or less linear. There seems to be some sort of steps, probably involving different people working on the patient. But apparently that was pre-Lean. So apparently that process could be improved.

AUDIENCE: Problem with that process was it took too long.

HUGH MCMANUS: OK, too many steps. So it's organized here. We can see a pretty clear path. But lots and lots of steps. So took too long. That's easy to understand. This one, yeah, more complex set of problems with that process.

In any case, the point here is not to is not to go too deep on the individual processes, but to get the point across that in order to improve a process, you have to understand it, and that one good way to understand it is visually, and maps help us with that.

So here's an example. It's not even a very good example, but it's an intuitive example. Most people would understand it. I want a hot dog. Or my kids want a hot dog. That's usually what happens on the weekends. Dad, can we have a hot dog?

So my customer, the kids, order a hot dog. So they're providing input to the process as well as being the output customer. They're kind of in a loop there. So then the question is, do I have hot dogs? So I go look in the pantry. Why the hot dogs are in the pantry I've still not figured out. They should probably be in the refrigerator. Apparently this is not a perfected process, but that's OK.

And if there is hot dogs in the pantry, I'm all set. If there's not, I have to go to the store. So there's a little bit of a decision here. Here's another supplier, which is the store. If I have everything I need, I cook the hot dog, I put it in the bun. I give it to the kids. We're all set. There's a little bit of an extra sort of tail end loop here, which is I got to clean up. And if I'm smart about it, I'll actually save myself some front end work by putting hot dogs on the shopping list if I used them all up. Not the greatest not the greatest process map, but it's one everyone can understand.

You could probably do better, and we're going to give you an opportunity to do exactly that. We're going to do a little bit more complicated process. It's not just kids ordering from me. But it's not that much more complicated, and it does, in fact, involve fixing hot dogs.

In your blue folder you have a little story about Sasha and Andy's hot dog stand, and the stuff in the front give you an introduction to Sasha and Andy, who have a hot dog stand. And they're doing fine, but they find that they are a little bit swamped. They have more customers than they can deal with, and they want to improve their process.

So we're going to help them do that. And so we're going to help them do that with a direct exercise here. Read the sheet here. For you, their process is actually already been broken down. If you were doing this with your own process from start, you'd have to do the little exercise of figuring out what are the steps, what are the inputs and outputs to the steps. Don't even worry about the data yet, just the first column. That's the steps that they take. That's been done for you, and we're going to map this.

So give you a second to look at that. Think about the steps, their inputs and outputs. And then we're going to create a map using the post-it notes which are out on the table with the sharpies. For each of the process elements, make a post-it. And this is not supposed to be complicated. The first one is, let's see, take order. So let's make it easy. Take order.

Who takes the order? Sasha takes the order. We could add that information, or we could use color. Perhaps this color implies Sasha. And we'll put that on our thing, and we're using a sticky. Why? We can move it around because a priori, we're not really sure how these things should be arranged to make the most sense.

Let's think about inputs and outputs who gives the input? Customer, OK. So there's another one. So we might want to do something like that. And you get the picture. We're not going to do the whole thing for you. You're going to do it. Get the stickies. Arrange them on the board. Don't start drawing lines yet because that would kind of ruin the point of having the stickies there.

When you think you have everything puzzled out, there might be some other details that are necessary. One of them is that there might be waiting or inventory. There may be places where the process waits. And the traditional symbol for that is a triangle. We don't have any triangle-shaped stickies, so we are going to use something like this. Perhaps there is a line of customers. So there's kind of an inventory waiting box in front of them. I don't know. I'm making this up as I go along.

And perhaps a decision has to be made at that point. Do we take the order or tell them no, I'm sorry, we don't sell that? Decisions are diamonds. You can do a diamond by just putting a square sideways. When all that is done, then it's time to draw the lines. You can actually even make that temporary and use stickies with arrows on them, or use string. I've participated in exercises where you do that. That's getting a little bit too clever. It gets a bit messy.

Best thing to do is arrange everything on the board with the stickies. When you think you got everything lined up, then draw lines to show how the process is flowing. This is a speed exercise. You only have 10 minutes, so get with your groups. Here are the basic mapping symbols, triangle, rectangle, diamond. Don't worry about issues yet. We're going to get to that. Map out this process.

[INTERPOSING VOICES]

HUGH MCMANUS: So time's up. I think everybody's got something that approximates a map here. And don't worry, you'll get that chance to play with it more in the near future. So let's see what we have. Let's have the folks in the back, who have a map that looks kind of different, let us know what they have.

AUDIENCE: So we had the [INAUDIBLE] colors as well, and it starts at the upper left and goes down here. We don't actually have the process line, but essentially the time next to each post-it referred to how long that is suggested to take. And then we have this loop-interlook process here where Andy will need to prepare the hot dog, and potentially multiple hot dogs.

And coming up here, Sasha checking the order and completing that process, as well as ending with a 10-minute-per-hour makes sense.

HUGH MCMANUS: And you've got sort of a different physical arrangement. Comes down and then back up again, which is sort of enforced by the geometry of that board. So that's fine. And I guess because maybe you didn't have time to finish with the lines, it's a little bit less clear kind of what the rework is. It looks a little more linear. That's fine.

And I don't think we're going to go through. It looks like everybody else also did a nice job. The point, though, is not to go through each individual one and give you a grade. The point actually is that I think all of these maps are successful in visually representing the process and some of its difficulties, the fact that it is fairly long, that it has reworks and decisions, that it has weights and times. Those are all captured.

And there's no real right answer because that's the point of our next slide. It's a 2D visualization. It's something that's actually taking place in 3D space. Plus there's time issues. There's issues of these processes that are not on the main loop. You can't basically get everything into a two-dimensional map. You do the best you can. You use it as a way of communicating the process. So capturing and communicating the key features of the process is what you want to do.

One thing that you do have to be careful of, and this exercise is actually fairly carefully designed this way, you have to capture-- I actually shouldn't say avoid unneeded details. You have to capture the right level of detail. If we just said, make the hot dog, we'd miss all of this interesting stuff.

On the other hand, if we went through--and some people did, and that's OK because I didn't tell you not to-- went through the individual, OK, take the order, chat with the customer, take the money. At some level of detail we might actually want to do that. At the level of detail of this whole process, if we get into those individual things, it gets too complicated. so most folks did capture that level of detail about right.

So I think we've all succeeded in doing the key thing, which is capturing the features of the process. We're going to come back to these maps. But for now, that's it for processes. Like I said, if there's one thing you take away from here, it's thinking about work as processes because once you think of something as a process, you can understand and improve it, often fairly intuitively. Often it really is application of common sense to the process to make it better.

So a little bit of a transition now. We're going to get into the five Lean thinking fundamentals. Earl introduced you a little earlier to the origins of Lean, how it came out of a study of Japanese practices by Jim Womack and his team. And Womack and Jones wrote a book in 1995, where they basically took the base, the ideas, the concepts of the Japanese system and captured them not so much as a system, but as a way of transforming existing processes into better ones.

They said, let's take these principles and figure out how they can be used to take existing processes, which are maybe not so great, and transform them into better ones. And that's kind of the essence of Lean as practiced in North America and Europe, at least. And here they are. Here are the fundamental principles.

First of all, specify value. Understand what we want to accomplish because if we don't do that, we can't really think clearly about any of the other steps. So what is the value of our hot dog stand? What is the value of a hot dog stand? Hot dogs, right? Hot dogs for customers, warm, safe, no diseases or bugs. You can think of a couple of the quality issues. You can think of some nuance to it. But basically, we want to make hot dogs.

Identify the value stream. We've sort of done that. If we think about the process and take a process map, but a rather specific kind of process map, which is a process map that follows the value added product through the process, and then think about how value is added to that product as it moves through the process, that's a value stream map. We're pretty close on this. We figured out the value is the hot dog, and we're following the hot dog pretty much. We're following a hot dog order through there.

So all of ours are approaching value stream. Not all process maps are. We could have followed Sasha around, right? What does that person do? That's not a value stream map. It's a process map. It's following that person's work process. But value stream map follows the product, the value added product. Make value flow.

Saw a couple of maps earlier. There was that engineering map. Didn't look like a lot of flow in that map. The lines are all over the place. The heart attack map was better. At least there was some coherent patient comes in to patient is resolved, in some way. So there was a potential there for flow, at least. But Earl was saying that in the old state, it wasn't really being achieved because there was too many steps. It was too slow.

So what we would like to do is have value flow through the value stream as continuously as possible, not necessarily as fast as possible, a low speed. Usually processes are too slow, so it's reasonable to say we would like it to flow quickly through the process.

Then we get a little bit more sophisticated, and by the end of the class, we'll get to what this concept means. It may not be intuitive right away. If we have a system that flows and creates value for the customer, there's the potential that we can allow the customers to pull value from that system. Like Lean, that's a slightly fraught word. What does that mean, especially when we're pulling on something that flows or pulling on water? I don't know, the metaphor's getting kind of messed up.

But the idea here is that essentially if the system flows continuously and creates value, from the customer's point of view, when they want something, they get it. They can come up to the hot dog stand, say, I want a hot dog. The hot dog comes. They're happy. And this act of satisfying the customer actually controls the process all the way back to the lowest levels. The customer gets their hot dog.

We essentially have a process that doesn't require a whole lot of decision making that isn't complicated, that flows, that creates the hot dogs, that orders the buns, that cleans up the grill, whatever. The whole system is set up so that the customer desire activates the system to satisfy that desire in a way that's continuous and easy and creates value with the minimum of waste.

And finally, pursuing perfection. If we can do all of this, we're not done because we can always do better. Earl mentioned the F18, how they identified them as a Lean enterprise. And the first thing they said is, that's not true. We have so much more to do. Right attitude. They knew that they weren't perfect.

An external observer said you're pretty good. But they knew that they weren't perfect. They were, in fact, pursuing perfection. So this is a continuous process.

All right. So we're going to spend the rest of both this unit, and then after lunch, the second unit, essentially walking through these concepts, going a little deeper and also giving you some tools on each one of these levels.

First thing we're going to talk about is value. This one is fraught. It's fairly easy to define value-- not always. You have to be a little bit careful- But? It's fairly easy to define the value of the output of a process. We want hot dogs. That's our value. When we start looking in more detail, what's the value of the individual process steps? Is cooking the hot dog valuable? I hope so, assuming you want it cooked.

But is cleaning the grill valuable? Maybe. We have to think about that a little harder. And in a real workplace, this can get very difficult, especially if you start attaching personal self-worth issues. If you're told you are non-value added, what does that do to your morale?

And it's not just a morale issue. It's also a motivation issue. When we first started applying Lean to product development activities, we got things completely up and down the scale from people arguing that their work was valuable because they knew it was without really any context to what it did for the customer, all the way to the other side, where we had some Lean experts come in and say, well, analysis isn't valuable because it doesn't add anything directly to the customer, which, as an analyst, I sort of had problems with. It took me a while to figure out exactly what the problem was with that.

But people that were too eager to essentially say that activities, and by implication, people were non-value added. The point is that you have to think about it. So there's some guides on here. We can think about value as like cooking the hot dog, things that directly transform material or information in the direction of the customer's desire and done correctly, no mistakes. That's unambiguously valuable.

The other end's kind of easy to think about, too, pure waste. Consumes resources but creates no value. So waiting. Inventory, stuff that's just sitting around. Mistakes. Reworking things in a creative sense can be good. But if it's because you're fixing a mistake, no value there. Things like that.

And then in the middle, there may be things that we know don't really add value but we simply have to do. There may be setup and tear down issues with our current technologies. There may be the necessity to do project coordination. We may have to satisfy regulations or laws. So there may be things that we got to do.

Like I said, t the individual task level, that's not necessarily an easy thing, and here's a great example. Does inspection add value? A couple of little brainteasers here. Inspect those. Everybody got them, maybe? Yeah.

This one's funny. One of my colleagues in the back, we have a mark-up copy of our slides because we are always doing continuous improvement. She found one of these double word things. See the two V's? She found a double word error. It wasn't even a line jumper. They were right next to each other on a slide we've been using for five years.

So people are not very good at this. People are not very good at inspecting in quality. So is it value added or not? And you could have a lively argument about. We're not now. Actually, anybody have any ideas? What's your gut feeling about inspection? Value added or not?

AUDIENCE: It depends on where it is in the process.

HUGH MCMANUS: Depends on where it is in the process. Very good. Very good answer, actually, nice general answer. But a very good answer. Yeah. aren't are very good at inspecting. And inspecting in quality is actually known not to work. On the other hand, you might have to do that. If something is super safety critical and it's just really hard to do right the first time, you might have to inspect it.

Also, continuous inspection of the work process is known to be quite valuable. Inspecting in quality at the end of something that should go right the first time, probably not. And unfortunately a lot of traditional, especially manufacturing-type processes lean on that a little too heavily.

So context dependent, an interesting case where you have to be careful that you don't assume something either way. Inspection is non-value added. No, no, no, it's super safety critical. We got to do it. I don't want to fly in an airplane that hasn't been inspected. But inspecting something that's coming off a line that you're making a million of, given that you know inspection doesn't work very well as a quality method, not so good. So that's value. We're going to do a little exercise in that before the day is over, before this class is over.

Identifying value stream. What is the value stream? It's the end- to-end activities that take place to deliver value. Said this already against that first slide, starting with the raw material or the initial information, ending with the customer, or user. From the beginning to the end, the material, the product flows is often a backwards flow of information. Customer needs, schedules, inventory information, et cetera. So is the main flow of the value from raw material or raw information to something the customer wants, often a backwards flow of information.

What moves in a value stream? Manufacturing, it's easy. Stuff. In design and services, less easy. Some kind of information flows. I call it the help line. I have a question. I want an answer. It's all information. It's not physical. It makes it a little bit harder to track, a little bit harder to think about. But there is a flow of information that is satisfying the customer.

In human services, medical, for example, it may be people. It may be the actual customer flowing through the system. And that could be in medicine. It could also be great Lean company, Disneyland. They process people and make them happy. But they think of it very much as a process. So there's a flow of people coming in sad and grumpy and going out sad, grumpy, and hot and poor, at least in my-- no, I joke. They have a good time. And the process is set up so they do.

So thinking about value streams the definition of the value stream is the set of activities that adds value to the work product to satisfy the customer. So the first order analysis of the value stream is to look for things that don't do that, look for waste. This is called waste hunting, and it's actually a lot of fun because it's easy. Most processes, once you've defined them, it's very easy to find wasteful steps. May be a little harder to get rid of them, but it's really easy to find them.

And waste comes in a couple of different flavors. We're actually going to be talking mostly about muda, about just looking at stuff that doesn't add value. So cleaning the grill or waiting or throwing away the unused hot dogs at the end of the day, or stuff that just is clearly not valuable.

Something to keep in the back of your mind, though-- and we'll come back to this later, especially the health care folks, you're going to get a good dose of this tomorrow-- are issues that can cause muda. And there's some Japanese words associated with this that don't have good translations. So we like to use the Japanese muri, overburden or unreasonableness.

Essentially, there's somebody in the process that too much is being asked of. Telling them to work harder doesn't do very much good. This can be people. It can be machines. We've got to run this machine 24/7. How good is that process? How long is it going to work? It's going to work until the machine breaks, and then it's not going to work at all anymore. So being unreasonable, overburdening things tends to spawn muda waste.

Even more dynamic as is mura, unevenness, instability. Again, there aren't particularly good translations. But the idea here is that if the process is uneven, if it's irregular or fluctuating, it can't flow. Again, our metaphor there, our sort of fluid flow metaphor, if the stream is turbulent, if it has back flows, if it has backwaters where it's not flowing, it has fast parts where it is flowing, if it's uneven, it's not going to be an efficient process. And so these are also kinds of wastes that one should look for. And often, these are the root causes of the musa, of the obvious waste.

Here are seven or eight mudas. These are sort of classic, right out of Toyota and Womack. There are lots of lists like this. In fact, most fields-- if you're in health care, engineering, whatever, you look up the latest book, they'll have a list like this. It won't be the same because everybody likes to make up lists for their own field. That's fine, actually.

These actually are kind of fundamental. You can translate these into almost any field. But if you want to make up your own, that's good, too. The whole point is to categorize. Categorizing waste makes it easier to spot. So things like waiting. That's pretty fundamental. Stuff that's not moving, people that aren't working, it's a waste.

Moving stuff around. Moving employees or moving the material or information. This is essentially movement of the value added stuff. This is movement of the resources, the employees, and the stuff necessary to do the work. Either of those is a waste. If your stuff is moving around, it's not being worked on, and that costs money or something. It costs people's time. It costs money to move around inventory.

Stuff that's sitting. It's kind of the converse of waiting. People are waiting, stuff is waiting.

Producing too much. It's efficient to produce large batches of things. That's still true even in our Lean world. However, if you don't need them, it's a waste. It's tempting, in Earl's analogy, to buy what's on sale, but if it goes bad, that's a waste, having too much. Defects, always bad. Doing more work than you need to affect the transformation. Engineers are great at that.

There's some question about whether our health care system over processes these things. That's a controversy, but all of these things don't add value. And they're fairly easy to spot. Unused employee creativity is often added as the eighth waste. Essentially, it's missed opportunities. It may be just missed work. But if they're just not working, that's waiting. But if they're working at a sort of mental level that's beneath them, if you're losing opportunities to take advantage of the employee's creativity and capability, that, too, is a waste.

Here's a really simple example of unnecessary movement from the health care world. This is called a spaghetti chart. It's actually a kind of process chart. It's not a value stream map. It's completely different. You have a physical layout that's a hospital floor. And you trace something. It could be the patient. It could be the nurse.

In this case it's the nurse doing their work. And this nurse is all over the place just because things are badly arranged. To get the work done, she actually ends up walking 1250 feet to do something trivial. Hopefully the patient is going from the elevator to the room, but the nurse, to get the patient checked in, has to run all over the place to do their job. So it's a great visual way of finding waste of movement.

And here's some tools at this value stream level to help. One of them is called kitting. This is kind of the active version of 5S. If we need to move materials to the place of work, why don't we move them laid out the way they're going to be used?

So here's a aerospace example. We had a beautiful picture that we didn't have copyright for, so now we have a bad diagram. But if you have a complicated mechanical assembly that uses lots of tubes and wires, why not just deliver all the tubes and wires you need in a box where they're laid out nice and easy for the workers to get them?

Likewise for a medical procedure, having everything laid out nice and neat is a good practice. Not new, right? I mean, a good OR doctor is going to have a tray that looks like that. But why isn't that standard practice? Why isn't that just done everywhere?

Mistake proofing. Mistakes in a process are waste. And relying on people to fix mistakes is dicey. People are good at some things, but not so good at others. And one of the things they're not so good is getting things right on a really consistent basis over many, many repeats. So why not make the process itself mistake-proof?

This is a great example. It makes me feel much better about being in a hospital. This is vacuum, and this is oxygen. Now some things you want to hook up to vacuum, and some things you want to hook up to oxygen. And those look the same. And in fact, the business end is the same. The coupler is the same.

Obviously, hooking the breather up to vacuum or the sort of waste disposal thing up to pure oxygen that will light it on fire, not a good idea. So there's a little stud so that when you hook the thing up, it won't go into the wrong one. Very simple, very effective. That basic idea applies across an amazing number of fields. Make it so you can't hook it up wrong.

There's a possibly apocryphal story about airplanes. A lot of airplanes these days fly by wire. Most of the controls go through electronic components. They use the same couplers because it's cheaper that way, so it's perfectly possible to hook up the right-hand controls to the left wing and vice versa. That's news, right? No, it's not possible anymore. That is something that has been mistake-proofed, fortunately, long ago.

Mistake-proofing the process. Checklist. This is a no brainer. But there's a great book out in the medical field called *Checklist Revolution* because it's revolutionary to use checklists. This, as a patient, scares the heck out of me because in the aerospace field, commercial airliners are astonishingly safe. They're probably the safest complicated thing any civilization has ever come up with. I'm sure they are, in fact.

And one of the reasons is that they are completely anal retentive about checklists. Maintenance people do it. The pilots do it. Everybody operates off of lists. So you're not relying on fallible human memory to make sure that the flaps work before you take off. There's actually a famous accident where they didn't bother to do the checklist. And the flaps were not working, and they took off, and it didn't work out so well. So very simple way of making sure that complex processes are actually executed correctly by fallible people.

OK. We're going to do a quick exercise in waste walking. I have handed out some dots. And we're going to look at our map and decide if each one of the steps and decisions-- don't bother with the weights because we're pretty sure those are non-value added-- but the steps and decisions, for sure. Are they value added, green? Do something for the customer. Are they necessary waste? We got to do them, but they don't really help the customer, but maybe the health board or whatever would be unhappy if we didn't do them. Or are they pure waste? Are they something we should try to get rid of? And

There's no right answer, and we're only going to take about five minutes. But we want you to, as a group, think about these issues against the process map that you've already done there. Here is your guide of wastes, if that's helpful to your discussion.

Take about five minutes, and that will actually conclude our exercise. But don't go away. We'll have a couple words before we let you go to lunch.

[INTERPOSING VOICES]

HUGH MCMANUS: Everybody's had a chance to at least argue about this. A lot of times the value isn't so much in the answer. It's in the debating. Trying to find out, maybe you never do decide whether it's valuable or not, but you do understand the issues.

So let's have one group that hadn't done it before, maybe you folks. Tell us your conclusions against your map there. So you're on camera. Do a good job here of explaining to us the value and non-value added that you guys found for the processes.

AUDIENCE: [INAUDIBLE] customer, we figured that, well, it's not essential. People expect it to happen. [INAUDIBLE] people get happy. Packing order on the board and getting the order we [INAUDIBLE] yellow. We think obviously was not value added. Then decision, when you add dots, again, it doesn't add value to the customer, but it needs to be done. [INAUDIBLE] the order all the way was is quite straightforward that adds value.

And then after that, checking the order is one of those-- I guess it doesn't add value to me as a customer. But if it's not done [INAUDIBLE], I'll be very happy. Adding beverage adds value. [INAUDIBLE] customer [INAUDIBLE]. Ideally customer would have just been [INAUDIBLE] waste time [INAUDIBLE] come up. And delivering order obviously adds value.

The rest of the general things like setting up the work area, cleaning, service, stuff like that, is all regulatory requirements and necessary evils.

HUGH MCMANUS: OK. See if we get any compare and contrast with, say, this group. You guys didn't read the report, did you? What do you guys have here?

AUDIENCE: So we have taking the order, collecting money, it's all very important. Tracking order is something that doesn't really add value to it, or putting it on the board. Then of course, getting the order, making it, cooking the hot dogs, that's all important. Checking if the order is complete doesn't really add value. But we need to do that so that you know what you're giving to the customer.

Of course you have to give them their beverage and [INAUDIBLE] their order. And then setting up and cleaning the back area where you're working, that's not really value added to the customer because they're not interacting with that space. But the place where they put on the condiments is important because it's part of their simple process.

HUGH MCMANUS: OK, so that's good. So we see some of the possibilities here. The thing that I noticed that actually is often one of the more controversial ones that you had different. You guys called it customer relations and gave it a green. And those folks chat with customer and gave it a yellow. And some people give it a red.

Now there's a red over there. There's a yellow to red over there. Right. So there's some judgment calls in there. And if this was a real exercise, what would we need to make that call before we told Sasha, no, sit down. Stop talking to the customers. No talking. Before we made that call, what would we need?

AUDIENCE: They ask the customer what they value.

HUGH MCMANUS: OK. Ask the customer.

AUDIENCE: I was going to say you could kind of do the analysis and see your profit over time versus chattering.

HUGH MCMANUS: See the chat versus, OK, we can get some data.

AUDIENCE: Decide what our mission is as a company.

HUGH MCMANUS: There we go. Yeah. Are we all about customer service, or are we just about hot dogs and nothing else? Are we the hot dog Nazis? We're just not nice to people but have great hot dogs.

Yeah, there's a bunch of there's a bunch of different factors that aren't on this piece of paper. That's the key thing. If we're sitting in our classroom here, we can't know these things. Here's another Japanese word. We have to go to the gemba, which is the actual place. That's the literal translation of gemba, the actual place where the work happens.

And this is another basic idea in Lean. We have to go to the place where the work happens. Sadly, we can't go visit Sasha and Andy because they're imaginary. Unfortunately, we also can't visit our shoe factory because of schedule and budget constraints this year. But after we come back from lunch, Earl will be taking us through a video factory tour so we can see real work in action.