

MANUFACTURING INSIGHTS

Learning Lean Through Simulation

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**MUSIC UP AND UNDER
NARRATION (VO) :**

MANUFACTURING INSIGHTS, MANUFACTURING ENGINEERING MAGAZINE'S VIDEO SERIES FOR PROCESS IMPROVEMENT.

THIS PROGRAM LETS YOU EXPERIENCE A SIMULATED LEAN TRANSFORMATION DURING A WEEK-LONG TRAINING COURSE.

NARRATION (VO) :

ALL INDIVIDUALS AND ORGANIZATIONS NEED EDUCATION BEFORE THEY BEGIN THEIR LEAN JOURNEY. THEY ALSO NEED TO CONTINUE THIS LEARNING AS THEY BEGIN THE CONVERSION TO A LEAN ORGANIZATION.

MANY COMPANIES USE SOME TYPE OF SIMULATION AS A FUNDAMENTAL ELEMENT OF TEACHING AND UNDERSTANDING LEAN MANUFACTURING FUNDAMENTALS.

NARRATION (VO) :

AN EDUCATIONAL SIMULATION CAN BE USED TO SHOW WHAT THE IDEAL STATE OF A LEAN ORGANIZATION LOOKS AND FEELS LIKE.

TO CREATE THIS LEARNING SITUATION, THE SIMULATION SHOULD BE AS CLOSE TO REALITY AS POSSIBLE. THE GROUP MUST FIRST OPERATE AS A TRADITIONAL OPERATION, THEN TRANSFORM TO A LEAN PRODUCTION SYSTEM.

THIS MAKES THE TEAMS NOT ONLY HAVE TO LEARN WHAT LEAN MEANS, THEY ALSO HAVE TO APPLY IT.

NARRATION (VO) :

TO GIVE YOU THIS LEAN EXPERIENCE, WE TRAVELED TO THE LEAN LEARNING CENTER LOCATED IN NOVI, MICHIGAN, TO BE PART OF THEIR LEAN EXPERIENCE PROGRAM.

DURING THIS WEEK-LONG PROGRAM, PEOPLE FROM INDUSTRIES RANGING FROM PET FOOD, TO STEEL, TO HEALTHCARE, CAME TOGETHER TO PRACTICE LEAN THINKING, AND UNDERSTAND THE RULES AND PRINCIPLES THAT MAKE LEAN WORK.

NARRATION (VO) :

WE ASKED LEAN LEARNING CENTER COFOUNDER AND PARTNER JAMIE FLINCHBAUGH WHY SIMULATION IS SUCH A VALUABLE TOOL.

JAMIE FLINCHBAUGH:

With simulation we get two effects, one is the experimentation in learning is greatly accelerated and has very low risk because it's not in the real environment.

We can do so many iterations in a simulation that might take years to try and do and replicate in a real environment. And if we screw it up, the results don't matter.

It's just a game and so if we do something wrong nobody cares. The other part it is, it's kind of fun, we let our guard down and while we are in that process we can learn much more because it's fun, it's a sense of play and we do learn more when we are in that mood.

Ha-ha-ha

NARRATION (VO) :

LEARNING IS A COMBINATION OF EXPERIMENTATION AND REFLECTION. UNFORTUNATELY, EXPERIMENTING WITH YOUR FACTORY LAYOUT CAN BE COSTLY AND TIME CONSUMING. YOU JUST CAN'T QUICKLY TRY DIFFERENT PLANT LAYOUTS AND SEE THE RESULTS, SO THAT'S WHERE SIMULATION CAN BE VALUABLE. SIMULATION WITH A GENERIC FACTORY OR A MODEL OF YOUR OWN PLANT WILL PROVIDE THE OPPORTUNITY FOR FREQUENT AND COMPLEXITY EXPERIMENTS WITHOUT THE HIGH COST, OR RISK OF FAILURE.

NARRATION (VO) :

PARTICIPANT TOM BOOTHE HAD THIS TO SAY ABOUT THE SIMULATION EXERCISE.

TOM BOOTHE :

I think it was real insightful, it helped us work together as a team, and it gave you the opportunity to try things that you normally wouldn't try.

NARRATION (VO) :

THE FIRST TIME THEY RUN THE SIMULATION, THE EXPERIMENT IS RUN WITH FOUR STANDARD ASSEMBLY DEPARTMENTS.

SOUND EFFECTS

DOUBLE RINGSIDE BELL "DING DING" BOXING RING BELL SOUND

NARRATION (VO) :

WE STARTED THE SIMULATION BY FORMING INTO FIVE DIFFERENT TEAMS THAT WILL COMPETE WITH EACH OTHER TO DESIGN AND OPERATE THE BEST FACTORY.

THE PRODUCT TO BE ASSEMBLED IS AN AIRPLANE WITH THREE DIFFERENT MODELS FOR THREE DIFFERENT CUSTOMERS.

THE TEAM SUPERVISOR WAS GIVEN A DETAILED DESCRIPTION OF EACH PRODUCT AND THERE WERE CERTAIN WORK RULES TO BE FOLLOWED DURING THE SIMULATION.

BEFORE THE SIMULATION BEGAN, EVERY TEAM MEMBER SELECTED A SPECIFIC ROLE. THE TEAMS STARTED THE FIRST ROUND OF THE SIMULATION WITH THE PROCESS THAT WAS EXPLAINED TO THE GROUP AND THE TEAMS IMMEDIATELY TRIED TO DO THE BEST THEY COULD WITH WHAT THEY HAD, JUST LIKE YOU DO AT YOUR REAL JOB.

NARRATION (VO) :

THE COMPONENTS OF THE PLANE ARE ASSEMBLED AT FOUR WORKSTATIONS: COCKPIT, FUSALAGE, TAIL SECTION AND WING THEN EACH SUB-ASSEMBLY IS MOVED TO FINAL ASSEMBLY.

BESIDES THE ASSEMBLY TASKS, OTHER ROLES INCLUDE THE MATERIAL HANDLER WHO RETRIEVES RAW MATERIAL FROM THE WAREHOUSE AND MOVES EVERYTHING BETWEEN WORKSTATIONS.

THE SUPERVISOR FILLS THE KEY ROLE AND MUST COORDINATE THE TEAM'S EFFORTS.

IN OUR SIMULATION, WE ALSO HAD SEVERAL EXTRA PEOPLE WHO PLAYED THE ROLE OF CONSULTANT TO PROVIDE INSIGHT INTO ANY PERCEIVED PROBLEMS.

NARRATION (VO) :

THE GOAL OF THIS SIMULATION IS OBVIOUSLY NOT TO LEARN HOW TO MANUFACTURE 12 TOY PLANES IN 36 MINUTES.

INSTEAD WE SET OUT TO LEARN ABOUT PEOPLE PROBLEMS, COMMUNICATION PROBLEMS,

MATERIAL PROBLEMS, CUSTOMER PROBLEMS, AND COORDINATION PROBLEMS, JUST LIKE ANY PROCESS IN A REAL FACTORY OR OFFICE.

NARRATION (VO) :

HAVE YOU EVER HEARD ANY OF THESE PROBLEMS IN YOUR FACTORY?

(AUDIO FROM TAPE) quality problems

(AUDIO FROM TAPE) grab those clips!

(AUDIO FROM TAPE) Need Parts!

NARRATION (VO) :

THE RESULTS OF THIS FIRST ROUND WERE QUITE DISAPPOINTING AND ANY SHAREHOLDERS WOULD NOT BE PLEASED IF THIS WERE A REAL COMPANY.

AT THE END OF THE FIRST ROUND OF THE SIMULATION WE MEASURED SEVERAL ASPECTS OF THE OPERATION. ON AVERAGE, EACH TEAM SHIPPED ONLY 2 PLANES ALTHOUGH THEY RECEIVED 12 NEW ORDERS.

THIS RESULTED IN ONLY FOUR MILLION DOLLARS REVENUE FROM 24 MILLION DOLLARS OF ORDERS.

FINAL INVENTORY COUNT WAS AN AVERAGE OF 3.2 MILLION DOLLARS INDICATING INVENTORY TURNS OF 1.25.

MORALE, DERIVED FROM A SURVEY OF TEAM MEMBERS BY THE SUPERVISOR, WAS SCORED AT AN AVERAGE 2.9 OUT OF 5.

LEAD TIME, MEASURED BY TRACKING HOW LONG IT TOOK FOR THE FIRST COCKPIT TO TRAVEL THROUGH THE PROCESS, WAS GREATER THAN 36 MINUTES.

LEAD TIME WAS SO LONG BECAUSE OF EXCESS INVENTORY AND SEVERAL OF THE FIRST COCKPITS, MARKED BY A TAG, NEVER MADE IT TO A CUSTOMER. ALL THINGS

CONSIDERED, THE TEAMS FIRST ROUND PERFORMANCE WAS DISAPPOINTING.

NARRATION (VO) :

BUT JUST AS IMPORTANT AS REVIEWING THE PERFORMANCE RESULTS, IS KNOWING HOW
THE PARTICIPANTS FELT DURING THE FIRST ROUND OF THE SIMULATION.

(AUDIO FROM VIDEO FOOTAGE)

NARRATION (VO) :

THE PARTICIPANTS TOLD US THEY WERE FRUSTRATED,
SOME SAID THEY WERE TOO BUSY,
SOME WERE BORED,
WHILE OTHERS WERE JUST CLUELESS OR STRESSED OUT.

SOUND EFFECTS

DOUBLE RINGSIDE BELL "DING DING"

NARRATION (VO) :

SINCE THE FIRST ROUND OF THE SIMULATION ENDED TWO DAYS AGO THE GROUP HAS BEEN
LEARNING LEAN RULES
AND PRINCIPLES AND APPLYING THEM TO THEIR SIMULATED AIRPLANE FACTORIES.

NARRATION (VO) :

DURING THIS SECOND ROUND OF THE SIMULATION, MANY PEOPLE NOTICE HOW MUCH
QUIETER IT IS WHILE THE TEAMS ARE AT WORK.

AUDIO FROM VIDEO WITH BACKGROUND NOISE ON

A 7.22.15/26

B 07.25.04/15

C 07.17.41/55

NARRATION (VO) :

DELETED

NARRATION (VO) :

PERFORMANCE RESULTS IN THIS SECOND ROUND WERE DRAMATICALLY BETTER THAN THE FIRST. ON AVERAGE, TEAMS EXPERIENCED A 350 PERCENT INCREASE IN OUTPUT, AND AN 87 PERCENT REDUCTION IN DEFECTS.

OTHER TEAMS HAD A 380 PERCENT INCREASE IN INVENTORY TURNS AND AN 86 PERCENT REDUCTION IN LEAD TIME. THE TEAMS DID THIS **WITHOUT** USING MORE PEOPLE, MORE EQUIPMENT, DIFFERENT CUSTOMERS OR MORE TIME. WHILE MOST COMPANIES CAN NOT ACHIEVE THIS SAME DEGREE OF IMPROVEMENT IN TWO DAYS, THIS SIMULATION DEMONSTRATES SOME OF THE OPPORTUNITIES FOR SIGNIFICANT IMPROVEMENT FOR VIRTUALLY ANY ORGANIZATION.

NARRATION (VO) :

BUT WHAT WERE THE CHANGES THAT THE TEAMS MADE IN ORDER TO SOLVE THEIR PROBLEMS AND ACHIEVE THOSE IMPRESSIVE RESULTS?

NARRATION (VO) :

DURING THE FIRST ROUND OF THE SIMULATION IT WAS OBVIOUS THAT THERE WAS A PROBLEM WITH THE FLOW OF WORK AND THAT THERE WAS A LOT OF WASTED MOTION. SO EACH TEAM STARTED OFF BY CREATING A SIMPLE WORK FLOW, WHICH IS ONE OF THE GUIDING LEAN PRINCIPLES.

EACH OF THE TEAMS ELIMINATED THIS WASTE BY MOVING THE WHOLE ASSEMBLY PROCESS TO A COMMON LOCATION SO THE WASTE OF TRANSPORTATION BETWEEN DEPARTMENTS COULD BE REDUCED.

WITHIN EACH SINGLE WORK AREA, WE SAW SEVERAL DIFFERENT SOLUTIONS TO THE CHALLENGE OF CREATING A SIMPLE AND SPECIFIC FLOW OF WORK.

ONE TEAM DESIGNED A VERY SMALL LAYOUT,

ANOTHER HAD EASIER ACCESS FOR THE MATERIAL HANDLER,

AND WHILE THEY COULD SURELY DEBATE FOR HOURS ABOUT WHICH IS BETTER, THE TEAMS INSTEAD FOCUSED ON THEIR GOAL OF MAKING PLANES AS FAST AS THEY WERE BEING ORDERED.

ONE TEAM EVEN DESIGNED THE FLOW TO BE SO SPECIFIC THAT THEY DREW ARROWS ON THE TABLE MAKING IT CLEAR TO THE OPERATOR WHERE THE NEXT THE PROCESS WAS.

NARRATION (VO) :

A BIG PROBLEM THE TEAMS ENCOUNTERED IN THE FIRST ROUND WAS COMMUNICATING WHAT TO BUILD NEXT? TO SOLVE THAT PROBLEM IN THE SECOND ROUND, MOST TEAMS FOUND A CLEAR WAY TO COMMUNICATE WHAT THE NEXT ORDER WOULD BE.

SOME TEAMS PUT TEMPLATES ON THE WALLS, OTHERS JUST ATTACHED THE INFORMATION TO THE PLANES THEMSELVES.

APPLYING THESE VISUAL MANAGEMENT TECHNIQUES TO THIS COMMUNICATION PROBLEM WAS VERY SUCCESSFUL IN REDUCING WASTED TIME. THEY ALSO FOUND THAT WHEN NEW ORDER INFORMATION COULD BE INTEGRATED DIRECTLY INTO THE MATERIAL FLOW, IT IMPROVED ASSEMBLY EFFICIENCY AND REDUCED ERRORS.

NARRATION (VO) :

ANOTHER ISSUE OF COMMUNICATION WAS HOW TO TELL THE MATERIAL HANDLERS WHAT TO MOVE. IN THE FIRST ROUND, THE MATERIAL HANDLERS JOB EXPLANATION COULD BEST BE DESCRIBED AS "SCRAMBLING."

IN THE SECOND ROUND, TEAMS FOUND DIFFERENT WAYS TO CREATE A CLEAR CUSTOMER-

SUPPLIER CONNECTION TO ACHIEVE ACCURATE MATERIAL CONTROL, ANOTHER UNDERLYING LEAN PRINCIPLE.

TO ACCOMPLISH THIS CONTROL SOME TEAMS CREATED A WORKSTATION LISTS OF REQUIREMENTS, OTHERS USED MATERIAL CONTAINERS THAT INCLUDED THE NECESSARY INFORMATION FOR EACH COMPONENT.

AND YET ANOTHER TEAM CREATED A SUPERMARKET WHERE ALL TEAM MEMBERS PULLED FROM CENTRAL BINS AND THE MATERIAL HANDLER FILLED THEM UP AS THEY WERE EMPTIED.

NARRATION (VO) :

ANOTHER CHALLENGE WAS TO PREVENT THE ERRORS THAT COULD OCCUR IN EACH ASSEMBLY WORKSTATION. USING THE LEAN RULE OF STRUCTURING EVERY ACTIVITY, TEAMS USED VISUAL MANAGEMENT AND ERROR PROOFING TECHNIQUES.

THE FASTEST AND MOST ERROR-FREE ASSEMBLY SOLUTION WAS A COLOR-CODED IMAGE OF THE PARTS THAT SHOWED THE PARTS LAID OUT IN ORDER. THIS INFORMATION MADE THE JOB EASY.

NARRATION (VO) :

DURING THE FIRST ROUND OF THE SIMULATION, SEVERAL PARTICIPANTS SAT AROUND WAITING FOR PARTS

WHILE OTHERS COULDN'T KEEP UP WITH THE WORK IN FRONT OF THEM.

TO SOLVE THIS, TEAMS REBALANCED THE WORK LOAD BY LOOKING AT THE STRUCTURE OF THE ACTIVITIES AND THE CUSTOMER DEMAND RATE, OR TAKT TIME, AND REBUILT EACH JOB ACCORDINGLY.

NARRATION (VO) :

IN ORDER TO ACHIEVE THESE RESULTS AND PUT IN PLACE SOME OF THESE IMPROVEMENTS, TEAMS DIDN'T JUST JUMP IN AND START MOVING THINGS AROUND.

THEY FIRST WENT THROUGH A STRUCTURED PROCESS OF UNDERSTANDING HOW THINGS

WORKED IN THE FIRST ROUND AND THEN THOUGHT ABOUT AND PLANNED THEIR IDEAL LEAN STATE.

NEXT THEY WORKED HARD TO COME UP WITH PROCEDURES AND EQUIPMENT TO HELP THEM REACH THIS IDEAL STATE.

FLINCHBAUGH :

From the simulation I think what people really start to experience on **Tuesday**, we see people are really putting in place tools. Their talking about one piece flow, their talking about standard work instruction, their talking about 5 s, and those are the things they are familiar with whether they have been on lean or if they just read one book on lean. They know those tools so when they really start to look at their simulation they think they can put in these five tools and I am going to have a much better result.

And when we hear them talking on **Thursday** we will hear them talking about the way they are looking at it, the way they are thinking together. The kinds of things they experienced while they were designing, or in their process.

NARRATION (VO) :

BEFORE ANY CHANGES WERE MADE, THE TEAMS SOUGHT TO UNDERSTAND THEIR CURRENT REALITY. THEY DID THIS BY DIRECTLY OBSERVING WORK AS ACTIVITIES, CONNECTIONS AND FLOWS BY MAPPING THEIR PROCESS.

THEY THEN USED THIS INFORMATION TO BUILD AN ACTIVITY MAP. THIS ACTIVITY MAP SHOWED THEM WHAT EACH PERSON DID IN EACH STEP OF THE PROCESS.

THEY ALSO BUILT A PRODUCT AND PROCESS MAP WHICH TOLD THEM WHAT HAPPENED TO THE PRODUCT AT EACH STEP OF THE PROCESS. THIS INFORMATION HELPED THEM TRULY UNDERSTAND THE SYSTEM THAT WAS DRIVING THEIR PERFORMANCE RESULTS.

NARRATION (VO) :

THE PURPOSE OF THESE MAPS IS TO ILLUSTRATE WHAT THEY COULD NOT SEE IN THEIR INDIVIDUAL ROLES OR EVEN AS AN OBSERVER. BY SEEING THE SYSTEM AS ONE SET OF ACTIVITIES, CONNECTIONS AND FLOWS, INSTEAD OF INDIVIDUAL PARTS, TOOLS AND PEOPLE, THE TEAMS HAVE A BETTER UNDERSTANDING OF THE ENTIRE PROCESS. THIS VIEWPOINT ALLOWS THEM TO MAKE CHANGES TO IMPROVE THE OVERALL PROCESS, NOT JUST ONE SECTION.

NARRATION (VO) :

NEXT THE TEAMS NEEDED TO LEARN HOW TO FIND OPPORTUNITY FOR IMPROVEMENT WITHIN THEIR PROCESSES. THEY LEARNED ABOUT THE PRINCIPLE OF SYSTEMATIC WASTE ELIMINATION AND LEARNED ABOUT THE SEVEN WASTES.

THE SEVEN WASTES ARE OVERPRODUCTION, WAITING, MOTION, INVENTORY, OVERPROCESSING, TRANSPORTATION AND DEFECTS.

NARRATION (VO) :

LEAN IS OFTEN PRESENTED AS A SET OF TOOLS THAT YOU DEPLOY IN ORDER TO ELIMINATE WASTE. INSTEAD, THESE TEAMS TOOK THEIR UNDERSTANDING OF WASTE ELIMINATION AND FOUND OPPORTUNITIES FOR IMPROVEMENTS.

WASTE ELIMINATION IS MORE THAN JUST A REASON TO DO LEAN, IT IS AN ACTIVITY THAT SHOULD BE PRACTICED EVERYDAY.

NARRATION (VO) :

THE TEAMS LEARNED THE PRINCIPLE OF WHAT IT MEANS TO ESTABLISH HIGH AGREEMENT, SO EVERYONE UNDERSTANDS BOTH WHAT TO DO AND HOW TO DO IT. HIGH AGREEMENT MEANS THAT THE TEAM MEMBERS VALUE USING A COMMON PROCESS MORE THAN THEIR OWN INDIVIDUAL WAY OF DOING THINGS. HIGH AGREEMENT WORKS BEST WHEN COMPANIES HAVE STANDARDIZED THEIR WORK PROCESSES.

NARRATION (VO) :

NEXT THE TEAMS GATHERED AROUND THEIR PROCESS MAPS AND LOOKED FOR WHERE THEY

LACKED HIGH AGREEMENT, AND FOUND THESE AREAS THAT WOULD BENEFIT FROM A DEEPER UNDERSTANDING OF THE PROCESS.

NARRATION (VO) :

WITH MANY NEW IDEAS GUIDED BY LEAN RULES AND PRINCIPLES, THE TEAMS SET ABOUT REDESIGNING EVERY ASPECT OF THEIR PROCESS, AND PUT THEIR IDEAS TO WORK. THE TEAMS WERE ANXIOUS TO PROVE THAT THEIR EFFORTS YIELDED SUCCESS.

NARRATION (VO) :

SO WHAT CAN WE LEARN FROM OBSERVING THESE PARTICIPANTS GOING THROUGH THEIR LEARNING PROCESS?

THERE ARE FOUR KEY LESSONS THAT EVERYONE CAN LEARN AND SHOULD APPLY TO THEIR LEAN TRANSFORMATION EFFORTS, WHETHER THEY ARE JUST GETTING STARTED OR THEY HAVE BEEN WORKING ON IMPROVEMENTS FOR MANY YEARS.

NARRATION (VO) :

LESSON ONE IS, LEAN IS NOT BORN FROM WHAT YOU SEE BUT FROM HOW YOU THINK.

Flinchbaugh:

The very first lesson that we try to get into their heads is that lean is about thinking lean. It isn't about a set of tools that you put in place one by one, lean is about the way that you think and look at the world. And you can take that thinking anywhere from home to different jobs to different industries, so that fundamental thinking is what we really focus on the rest of the week. And while they may or may not know what every tool is in the lean toolbox, that's ok, because we don't want them to be just carrying a toolbox around and many of the tools might not work in their environment anyway.

So as they learn lean, they really learn how that thinking should work, and the tools become much easier for them to put into place.

NARRATION (VO) :

“LESSON 2 IS, ADULTS LEARN BEST THROUGH DISCOVERY”

NARRATION (VO) :

ADULTS LEARN AND RETAIN MORE INFORMATION WHEN THEY ARE ABLE TO APPLY FRESHLY LEARNED TECHNIQUES, THEN REFLECT ON WHAT THEY REALLY LEARNED.

LEADERS AT ALL LEVELS MUST UNDERSTAND HOW ADULTS LEARN IN ORDER TO HELP PROMOTE LEAN THINKING WITHIN THEIR ORGANIZATION.

NARRATION (VO) :

LESSON 3 IS, LEAN IS A CONTINUOUS JOURNEY

FLINCHBAUGH :

The idea of improvement through experimentation, that there is no one right design that you just implement into every process and automatically get a better result. That really it's a process of step by step iteration and experimentation all moving in the same direction but that experimentation, guided by lean principles, really leads them to a better result.

And so as they are working on their simulations they get to practice things like observing work in a different way, really understanding how work is processed in a different environment. Begin able to see waste that they wouldn't be able to see before, they knew they were frustrated they knew they weren't getting good results, but now they could see the why's, they could see what was breaking down in the system.

Being able to put in the principal of high agreement and be able to make sure that their process was a process that had a very little ambiguity about how they were going to get the work done.

It wasn't just about how they were going to assemble planes its also about how they communicated, how they worked together, or how things are connected from one step to the next.

A process where if they are just better at building planes, they still won't necessarily get better results and in fact some times it can get worse

NARRATION (VO) :

LESSON 4: LEADERS MUST BE LEARNERS AND TEACHERS TO DRIVE CHANGE

NARRATION (VO) :

A SUCCESSFUL LEAN TRANSFORMATION REQUIRES LEADERS TO MAKE MANY DIFFICULT CHANGES IN HOW AN ORGANIZATION PERFORMS.

DENNIS PAWLEY, WHO LEAD 90,000 PEOPLE THROUGH A LEAN TRANSFORMATION WHILE EXECUTIVE VICE-PRESIDENT OF MANUFACTURING AT CHRYSLER, SHARES HIS VIEW OF THIS LEADERSHIP GAP AS HE DESCRIBES A CUSTOMER WALK.

PAWLEY:

Take a customer walk sometime. Pretend you have a customer along side of you and say ok. What I'm doing right now, would that customer look at that as being a legitimate reason for him to pay part the cost of my product, am I value added to the customer with what I am doing right now. That's a tough walk,... If you really want to do it. I would tell you today that most executives when you take that customer walk and say, am I doing true value added work? Is this what the customer wanted me to be doing? I'm telling you 80 to 85% of what executives do today wouldn't pass this customer test. 80 to 85% of what executives do today is overlap.

NARRATION (VO) :

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TO BE COMPETITIVE, ALL COMPANIES MUST MAKE PLANS TO EDUCATE THEIR ENTIRE TEAM ABOUT LEAN MANUFACTURING BEFORE ANY MEANINGFUL CHANGE CAN BE ACCOMPLISHED.

WHETHER YOU USE AN EXISTING SIMULATION, OR MAKE ONE UP YOURSELF, EXPERIENCING A SIMULATION CAN BE AN EXTREMELY EFFECTIVE TOOL FOR HELPING TO ACCELERATE THE LEAN LEARNING PROCESS.

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THANK YOU TO THE STAFF AND PARTICIPANTS OF THE LEAN LEARNING CENTER