

MANUFACTURING INSIGHTS

Kanban Systems

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MUSIC UP AND UNDER

NARRATION (VO) : MANUFACTURING INSIGHTS, MANUFACTURING ENGINEERING MAGAZINE'S VIDEO SERIES FOR PROCESS IMPROVEMENT. THIS PROGRAM WILL DEMONSTRATE KANBAN SYSTEMS, AND WILL SHOW HOW THIS LEAN TECHNIQUE IS USED TO CONTROL INVENTORY AND ALLOW COMPANIES TO RESPOND BETTER TO CUSTOMER DEMAND.

NARRATION (VO) :

THE INTRODUCTION OF THIS PROGRAM WILL HELP YOU UNDERSTAND THE BASIC CONCEPTS OF KANBAN AND SHOW YOU WHERE IT WILL BE SUCCESSFUL.

NARRATION (VO) :

YOU WILL SEE KANBAN IN USE AT... CARVER PUMP, WHERE KANBAN AND OTHER LEAN TECHNIQUES HAVE BEGUN TO LOWER THE TIME IT TAKES TO RESPOND TO CUSTOMER ORDERS OF SPECIALIZED MILITARY AND COMMERCIAL PUMPS...

NARRATION (VO) :

...AND AT ARIENS CORPORATION, WHERE KANBAN SYSTEMS ARE BEING USED IN MANY FORMS TO HELP ARIENS BUILD SNOW BLOWERS AND LAWN MOWERS WITHOUT EXCESSIVE INVENTORY.

NARRATION (VO) :

THE PROGRAM WILL WRAP UP WITH SEVERAL BASIC RULES TO FOLLOW WHEN USING KANBAN SYSTEMS.

NARRATION (VO) :

TO BEGIN, LET'S FIRST UNDERSTAND: WHAT IS KANBAN? KANBAN IS A JAPANESE TERM FOR A VISUAL SYSTEM WHICH IS USED TO TRIGGER ACTIVITY UPSTREAM IN A GIVEN PROCESS. THIS SYSTEM CONTAINS THE CRITICAL INFORMATION THAT CONTROLS THE PRODUCTION OF THE RIGHT PRODUCTS, IN THE RIGHT QUANTITY AND AT THE RIGHT TIME.

NARRATION (VO) :

KANBAN IS THE **KEY** TOOL TO MANAGE JUST-IN-TIME PRODUCTION WHICH IS A MAJOR PART OF THE TOYOTA PRODUCTION SYSTEM. TOYOTA AND MANY OTHER COMPANIES USE KANBAN AS A SIMPLE AND DIRECT FORM OF COMMUNICATION INSIDE THE PRODUCTION PROCESS.

NARRATION (VO) :

THE BASIC KANBAN ACTIVATES MATERIAL MOVEMENT WHEN PEOPLE IN A DOWNSTREAM PROCESS COME TO THE UPSTREAM PROCESS TO WITHDRAW THE CORRECT QUANTITY OF PARTS ,AT THE RIGHT TIME.

NARRATION (VO) :

THEN, AS A RESULT OF THIS WITHDRAWAL, THE PRECEDING PROCESS PRODUCES ONLY ENOUGH PARTS TO REPLACE THOSE THAT HAVE BEEN WITHDRAWN.

NARRATION (VO) :

THIS, IN ESSENCE, CONNECTS THE TWO PROCESSES AND CREATES A "PULL" SYSTEM. AS EACH SUB-PROCESS WITHIN AN ORGANIZATION IS CONNECTED BY A KANBAN SYSTEM, THE ENTIRE PROCESS BEGINS TO ACT AS A SINGLE UNIT WHERE THE PRODUCT IS PULLED TO THE CUSTOMER DEMAND.

NARRATION (VO) :

THIS RESULTS IN THE ELIMINATION OF EXCESS INVENTORY, EXCESSIVE EQUIPMENT, AND THE RISK OF WASTED MATERIAL DURING MODEL CHANGEOVER.

NARRATION (VO) :

THE MOST IMPORTANT POINT TO REMEMBER ABOUT A KANBAN SYSTEM, IS THAT THE BEST KANBAN

SYSTEM IS NO KANBAN SYSTEM. THE USE OF KANBAN IS ONLY A SUBSTITUTE FOR NOT BEING ABLE TO IMPLEMENT SINGLE PIECE FLOW IN YOUR PROCESS.

NARRATION (VO) :

SINGLE PIECE FLOW IS THE LEAST WASTEFUL METHOD TO PRODUCE GOODS AND SERVICES. HOWEVER, IT IS OFTEN DIFFICULT IF NOT IMPOSSIBLE TO ACHIEVE WITH MOST OF THE EQUIPMENT USED IN MANUFACTURING TODAY.

NARRATION (VO) :

AS YOU IMPLEMENT A KANBAN SYSTEM, YOU MUST PRACTICE CONTINUOUS IMPROVEMENT AND TRY TO ELIMINATE THE KANBAN.

YOUR IMPROVEMENT EFFORTS MUST FOCUS ON:

REDUCTION OF SET-UP TIMES...

STANDARDIZATION OF JOBS...

SMOOTHING OF PRODUCTION...

IMPROVING MACHINE LAYOUT...

AND USING RIGHT SIZED EQUIPMENT...

NARRATION (VO) :

YOUR IDEAL STATE WOULD BE SINGLE PIECE FLOW THROUGH ALL THE MAIN PROCESSES AND SUB-PROCESSES.

NARRATION (VO) :

KANBAN SYSTEMS ARE USED TO PERFORM THE FOLLOWING FUNCTIONS:

INSTRUCTION,

SELF CONTROL TO PREVENT OVERPRODUCTION,

VISUAL CONTROL,

REDUCTION OF MANAGERIAL COSTS, AND

REDUCE INVENTORY

NARRATION (VO) :

THE KANBAN SIGNAL NOT ONLY SERVES AS THE INSTRUMENT OR TRIGGER TO REPLENISH OR MOVE PARTS OR PRODUCTS, BUT IT ALSO PROVIDES **INSTRUCTION** ON WHERE TO WITHDRAW THE PRODUCTS. IT ALSO DEFINES THE LOCATION WHERE THE PRODUCTS ARE TO BE POSITIONED IN THE DOWNSTREAM AND UPSTREAM PROCESSES. IT IS VERY IMPORTANT THAT THIS INFORMATION BE ACCURATE TO ELIMINATE THE WASTE OF SEARCHING.

NARRATION (VO) :

THE KANBAN PROVIDES **SELF CONTROL TO PREVENT OVERPRODUCTION** IN SEVERAL WAYS. THE NATURAL PULL FROM THE DOWNSTREAM PROCESS CONTROLS THE UPSTREAM PROCESS IN TERMS OF PRODUCING MORE PRODUCTS. THIS ALSO ALLOWS EACH PROCESS TO BE AUTONOMOUSLY CONTROLLED BASED ON THE TRIGGERED KANBANS.

NARRATION (VO) :

OVER PRODUCTION CAN BE FURTHER RESTRICTED BY DEFINED PARTS STORAGE LOCATIONS ON FLOORS OR SHELVES. THIS CAN BE ACHIEVED BY USING PAINTED AREAS, LINES OR TWO-BIN SYSTEMS TO PREVENT OVERPRODUCTION.

NARRATION (VO) :

KANBANS NOT ONLY GIVE NUMERICAL INFORMATION ON THE CARD OR TAG IN TERMS OF QUANTITY, CONTAINER SIZE AND LOCATION, BUT SOME TIMES THEY PROVIDE A **VISUAL CONTROL** LIKE AN IMAGE OF THE PART TO MAKE IT EASY TO KNOW ITS THE RIGHT PART.

NARRATION (VO) :

IF THE PRODUCTION ORDERING KANBANS ARE NOT POSTED ON THE PRODUCTION ORDER BOARD ON TIME, THE PRODUCTION WILL NOT HAPPEN ON TIME, AND THE RESULT WILL BE A DELAY IN THE DOWNSTREAM PROCESS.

NARRATION (VO) :

USE OF KANBAN WILL RESULT IN A REDUCTION OF MANAGERIAL COSTS. A WELL-DESIGNED AND MAINTAINED KANBAN SYSTEM WILL REDUCE THE NEED FOR MATERIAL PLANNERS. KANBAN REDUCES, IF NOT ELIMINATES, THE NEED TO PLAN EVERY LEVEL OF THE PROCESS.

NARRATION (VO) :

THE SECOND KEY BENEFIT OF IMPLEMENTING KANBAN SYSTEMS IS THAT OF **REDUCED INVENTORY**. THIS REDUCTION IS A RESULT OF THE PULL SYSTEM DRIVING THE REPLENISHMENT AND THE CONTINUOUS IMPROVEMENT PROCESS WORKING TO REDUCE THE QUANTITY OF MATERIAL, AND THEN FINALLY, THE NEED FOR THE KANBAN COMPLETELY.

NARRATION (VO) :

CARVER PUMP, LOCATED IN MUSCATINE, IOWA, PROVIDES CENTRIFUGAL PUMPS TO BOTH INDUSTRIAL AND GOVERNMENT CUSTOMERS.

NARRATION (VO) :

CARVER EMPLOYS AROUND 100 PEOPLE TO MACHINE AND ASSEMBLE A VARIETY OF PUMPS THAT ARE USED THROUGHOUT THE WORLD TO MOVE WATER, OILS AND CHEMICALS. THESE PUMPS COME IN MANY CONFIGURATIONS SUCH AS HORIZONTAL AND VERTICAL END PUMPS AND MULTI-STAGE UNITS.

NARRATION (VO) :

CARVER'S STRATEGY IS TO OFFER HIGH VALUE THROUGH COMPETITIVE PRICING OF A PREMIUM PRODUCT. THEIR GOAL IS TO DELIVER A ROBUST PRODUCT BUILT FROM STRAIGHTFORWARD DESIGNS BASED ON MODULAR GROUPS OF COMMON PARTS.

NARRATION (VO) :

THIS STRATEGY CREATES A VARIETY OF 50,000 PART NUMBERS THAT ARE NECESSARY TO DELIVER THEIR PUMPS. EACH MONTH 2000 OF THE 50,000 PARTS ARE USED IN THEIR OPERATION. BEFORE THE APPLICATION OF KANBAN, ABOUT 95% OF THE PARTS WERE RUN ON RELATIVELY LOW LOT SIZES AND THE REMAINING 5% WERE RUN WITH LARGE LOT SIZES.

NARRATION (VO) :

AS CARVER BEGAN THEIR LEAN JOURNEY, THE CHALLENGE FOR CARVER WAS TO DEVELOP PULL SYSTEMS THAT WOULD CONNECT THE VARIOUS PRODUCTION AND ASSEMBLY CELLS. THIS PULL SYSTEM HAD TO FLEX ENOUGH NOT TO DRIVE UP INVENTORIES WHEN ORDERS SPIKE UP OR DOWN.

NARRATION (VO) :

CARVER ALSO FACED THE CHALLENGE OF FINDING THE RIGHT LOT SIZES SO THEY COULD COMBINE SET-UPS ON SIMILAR COMPONENTS TO REDUCE THE NUMBER OF SET-UPS.

BUTCH- 02.02.34.00 to 2:02:51:26 We have such a high variety of parts going through our cells, that if we ran to demand, over 50% of our day we would be in set-ups, and with 50% of your day in set-ups, we would not be able to meet demand. So we need that buffer in there to have parts available since we cannot run to demand.

NARRATION (VO) :

PREVIOUSLY, CARVER KEPT LOTS OF INVENTORY ON THE SHELF TO TRY TO ALWAYS HAVE WHAT THEY NEEDED, BUT IT DIDN'T ALWAYS WORK OUT THAT WAY.

BUTCH-02.04.32 to 02:04:53 By running batch work we had a lot of parts on the shelf, a lot of wrong parts on the shelf. By picking out the ones that we needed for our Kanbans, we had the right parts available and the rest of the inventory was able to just go away. So we reduced a lot of inventory we opened a lot of floor space, and freed up a lot of cash.

NARRATION (VO) :

ONE OF THE OTHER ISSUES CARVER WAS FACING WAS CUSTOMER LEAD TIME. WITH THE LARGE BATCH SIZE PRODUCTION RUNS, ORDERS WERE RUNNING ABOUT 10 DAYS LATE. THE MACHINING SEQUENCE OF THE PARTS WAS NOT IN THE SEQUENCE THAT THE ASSEMBLY AREAS NEEDED THEM.

BUTCH 02:04:07 till 02:04:23: The delivery times without the Kanbans in place, we had to just carry a lot of inventory, to have parts available, so in order to keep the parts available, because we can't run to demand, the Kanbans still have the parts there so we can meet our on-time performance.

NARRATION (VO) :

AS CARVER STARTED TO BUILD CELLS TO MACHINE THE VARIOUS COMPONENTS FOR THE PUMPS,

SEVERAL TYPES OF KANBAN SYSTEMS WERE PILOTED. THESE KANBAN SYSTEMS INCLUDED:

VISUAL REPLENISHMENT,

CARD,

SINGLE BIN,

AND TWO OR THREE BIN SYSTEMS.

AFTER WORKING WITH EACH SYSTEM, THE SINGLE BIN WAS SELECTED FOR LOW VOLUME, AND A TWO OR THREE BIN SYSTEM WAS SELECTED FOR MEDIUM AND HIGH-VOLUME PARTS.

NARRATION (VO) :

AFTER A SPECIFIC CONTAINER WAS IDENTIFIED FOR EACH TYPE OF PART, THE CONTAINER QUANTITY WAS DETERMINED. THIS PROCESS UTILIZED SEVERAL ELEMENTS FOR THE CALCULATION. IT WAS DETERMINED THAT TO LEVERAGE THE SET-UP AND CAPACITY RATIO, AN AVERAGE WEEKLY QUANTITY WOULD BE RUN. THIS WOULD GIVE THE MACHINING CELL ONE WEEK TO REFILL THE CONTAINER ONCE THE ASSEMBLY CELL RETURNED THE EMPTY CONTAINER TO THE MACHINING CELL. VARIABLES INCLUDE CELL AVAILABILITY, DIFFICULTY OF PART, SET-UPS AND THE CONSISTENCY OF DEMAND FOR THE PART. THESE FACTORS AND THE AVERAGE WEEKLY DEMAND PROVIDED THE DATA TO SET THE NUMBER OF CONTAINERS THAT ARE REQUIRED. AFTER THE QUANTITY WAS SET, A SAFETY FACTOR WAS DETERMINED.

*FOR LOW QUANTITY PARTS, CARVER USES A SIMPLE ONE BIN SYSTEM. THESE SHAFT BINS ARE PAINTED GREEN, YELLOW, AND RED TO CLEARLY INDICATE THE DEMAND STATUS OF EACH SHAFT.

NARRATION (VO) :

IF POSSIBLE, EACH CONTAINER IS SPECIFIC TO THE STYLE OR SIZE OF PART THAT IS BEING MANUFACTURED TO MAKE SURE WORKERS ARE USING THE RIGHT BIN.

NARRATION (VO) :

THE BASIC TWO BIN SYSTEM AT CARVER HAS ONE PALLET OR CONTAINER STORED IN THE ASSEMBLY CELL AND ONE IN THE MACHINING CELL. WHEN THE ASSEMBLY CELL EMPTIES THE CONTAINER IN THEIR CELL, THEY RETURN THE EMPTY BIN TO THE CELL THAT IS INDICATED ON THE CONTAINER. THEY THEN PULL THE FULL CONTAINER AND RETURN TO THE ASSEMBLY CELL.

THIS NEWLY EMPTIED BIN IS THE SIGNAL FOR THE MACHINING CELL TO FILL THE CONTAINER IN THE NEXT SET-UP CYCLE.

NARRATION (VO) :

THE SECOND TYPE OF KANBAN SYSTEM AT CARVER USES A PUSH CART FOR EACH NEW INDIVIDUAL PUMP. THIS CART STARTS IN THE ASSEMBLY CELL WHEN EACH ORDER IS PLACED AND MOVES THROUGH THE PROCESS. BASICALLY, THE CART TRAVELS BETWEEN MACHINING CELLS COLLECTING THE NECESSARY COMPONENTS FOR THE PUMP ASSEMBLY. EACH CELL OPERATOR PUSHES THE CART TO THE NEXT CELL. WHEN ALL THE COMPONENTS ARE COLLECTED ON THE KIT, IT IS THEN SEQUENCED BACK TO THE FINAL ASSEMBLY PROCESS.

NARRATION (VO) :

BESIDES THESE INTERNAL CONTROLS, A KANBAN SYSTEM WAS ALSO APPLIED TO OVER 500 EXTERNAL PARTS FROM SUPPLIERS. FOR THESE PURCHASED PARTS, KANBAN CARDS WERE HUNG ON BINS STORING THESE PARTS. WHEN A BIN IS CONSUMED, THE CARD IS PULLED AND FAXED TO THE SUPPLIER. THE CARD IS THEN SENT TO RECEIVING WHERE IT WAITS FOR THE PARTS. WHEN THE PARTS ARRIVE, THE KANBAN CARD IS REATTACHED AND PLACED BACK INTO INVENTORY WITH THE PARTS.

NARRATION (VO) :

SOME SMALLER ITEMS LIKE THESE O-RINGS ARE NOT STORED IN A BIN, BUT ARE STILL CONTROLLED BY KANBAN. ONCE THE KANBAN CARD IS EXPOSED, IT IS FAXED TO REPLENISH THE PARTS.

NARRATION (VO) :

(MOVED TO END OF SCENE 39)

NARRATION (VO) :

CARVER'S LEAN EXPERIENCE HAS TAUGHT THEM SOME GOOD LESSONS IN KANBAN AND HAS GREATLY IMPROVED THEIR ON TIME PERFORMANCE.

BUTCH- 02.18.44 02.19.18 the first thing you want to do is make sure you need it. We had a lot of part numbers in Kanban we were able to pull out of Kanban, and just run to demand, we didn't need that buffer. But if you do need that buffer of a

Kanban, first, don't make it permanent, and make it simple. We have tried numerous types of Kanbans, there are cards systems out there that we tried, the bin systems, the visual systems. Find the one that works for you, and that is what we did and just keep it as simple and visual as possible.

NARRATION (VO) :

ARIENS CORPORATION IS LOCATED IN BRILLION, WISCONSIN PRODUCING LAWNMOWERS AND SNOWBLOWERS FOR BOTH CONSUMERS AND PROFESSIONALS. ARIENS OCCUPIES ABOUT 700,000 SQUARE FEET IN TWO MANUFACTURING FACILITIES AND EMPLOYS ABOUT 750 PEOPLE.

NARRATION (VO) :

A PROBLEM AT ARIENS WAS THE EXCESSIVE INVENTORY THAT ARIENS CREATED WITH A BATCH STAMPING OPERATION THAT FORMED LARGE QUANTITIES OF METAL PARTS, THAT THEN NEEDED TO BE STORED.

NARRATION (VO) :

PRODUCTION WAS PREVIOUSLY CONTROLLED BY A MATERIAL RESOURCE PLANNING OR MRP COMPUTER SYSTEM THAT DID NOT ALWAYS KNOW WHAT WAS REALLY BEING BUILT IN THE PLANT.

Jeff 05.26.13 to 05.26.36 if you can imagine being in the MRP world where they controlled everything, and they controlled it all from the computer information that came into them and then they disseminated that out to the factory and decided who did what at every moment. And then going to a kanban system, it is quite a shock.

NARRATION (VO) :

A KEY ISSUE WAS THAT THIS FABRICATION PLANT IS ONE HALF A MILE FROM THE ASSEMBLY PLANT.

NARRATION (VO) :

ARIENS DECIDED TO TRY KANBAN TO ELIMINATE SOME INVENTORY, AND CREATE FLOW.

PAUL 04:01:40:08 till 04:01:47:18 our flow has greatly improved to the point that we have the right product at the right time, in the right quantities that we want.

NARRATION (VO) :

SEVERAL TYPES OF KANBAN SYSTEMS WERE USED TO ACHIEVE THE REDUCTION OF INVENTORY.

PAUL 04:03:06 till 04:03:45:20 ... We do have the typical kanban card for an individual part number.

We have a kanban kit card which would contain anywhere from 2 to 10 different part numbers per card so that we can deliver in a kit fashion.

We have visual management systems where there is a display that says you need x number of parts in these many bins and things like that is purely visual.

We also use the carts. We have carts that go from plant one to plant three for paint, and also carts from the paint line to the assembly area as well.

NARRATION (VO) :

ONE OF THE KEY BENEFITS FROM A KANBAN SYSTEM IS THAT YOUR SUBORDINATE SYSTEMS BECOME ALIGNED WITH CUSTOMER DEMAND RATE. IN THE CASE OF ARIENS, THE PURCHASED MATERIALS ARE PREPARED AS A KIT, THE PAINTED PARTS ARE PREPARED AS A KIT AND THE FABRICATED PARTS ARE PREPARED AS A KIT. THE MARRIAGE OF THESE VARIOUS KITS AT ASSEMBLY PROVIDES ALL THE COMPONENTS TO KEEP PRODUCT FLOWING TO THE CUSTOMER.

NARRATION (VO) :

THESE VARIOUS CARTS ARE AN INTEGRAL PART OF THE PRODUCTION SYSTEM BUT HOW DO THEY CONTROL INVENTORY?

PAUL 04:04:05 till 04:04:38:02 The cart has a bill of materials if you will on there that needs to be filled. We have people that then pull all of those products from the super market and load up the cart. Once the cart is full it is sent back down to the paint line and that is the signal and the means of transferring those parts as well. We don't use any other system to get those parts to the paint line we use the cart. If there is a cart to be filled, we fill the cart, if there is no cart, then obviously, nothing to fill.

NARRATION (VO) :

EMPLOYEES AT ARIES METAL STAMPING PLANT CAME UP WITH A WAY TO MAKE 10 DIFFERENT METAL PARTS OF A SINGLE PRODUCT WITH ONE HIT OF THE PRESS. THEY CALL IT "ONE HIT, ONE KIT". AFTER STAMPING, THE KITED PARTS ARE THEN HUNG DIRECTLY ONTO A CART FOR TRANSPORTATION TO THE PAINT LINE.

NARRATION (VO) :

IN SOME CASES, A PORTABLE WELDING BOOTH IS PLACED NEXT TO THE PRESS TO WELD SUBASSEMBLIES AND MAINTAIN PRODUCT FLOW. BY WELDING THEM AT THE PRESS, ARIENS

ELIMINATED THE INVENTORY OF THIS PART IN WELDING.

NARRATION (VO) :

WITH THE IMPLEMENTATION OF KANBAN AND REMOVAL OF A COMPUTERIZED SCHEDULING SYSTEM, YOU'RE CHANGING THE FOUNDATION OF YOUR MATERIAL CONTROL. AT ARIENS THEY FACED SOME PROBLEMS DURING THIS TRANSITION.

PAUL 04:05:43:00 till 04:06:10:18 But as our people had to learn the Kanban system and we had to put our trust in that Kanban system that is telling us to build the right thing at the right time and that is a huge learning curve going into the Kanbaning adventure here, we did have to work on that here, trusting the kanban, using that as the signal rather than have some computer tell us that we need to make something.

PAUL 04:06:22 till 04:07:23 Well we went through a fairly significant training curve with all of those people we needed to get not only the planners and the material handlers but the operators as well trained on how to handle those cards. I always say there is a few "Thou shall not's" with Kanban Cards, thou shall not loose it, thou shall not write on it, those kind of things, so that we adhere to the system. As we got more and more Kanbans in place the planners began to see this is making their much job easier, it is one less thing they would have to look up on the computer to see if they had to make it. And as we get more and more involved in it the material handlers like it because it tells them right where to move the parts. All the information you need is right their on the card and the operators themselves in the individual cells, we have trained them how to read the cards so they know what to make and when to make it. They really control their own destiny with those kanban cards.

NARRATION (VO) :

ARIENS HAS MANY KANBAN SYSTEMS HARMONIOUSLY SUPPLYING COMPONENTS NEEDED TO BUILD A PRODUCT IN THE ASSEMBLY CELL ONLY AS THE PRODUCT IS NEEDED. SOME SYSTEMS ARE FOR PURCHASED PARTS LIKE THESE ENGINES, AND OTHERS ARE TO PULL PARTS FROM THE PAINT DEPARTMENT OR THE FABRICATION CELLS.

NARRATION (VO) :

ONCE THE PARTS ARE CONSUMED IN ASSEMBLY, THE KANBAN CARDS AND EMPTY CARTS ARE RETURNED TO THE ORIGINATING CELL. THIS IS THE SIGNAL TO MAKE MORE OF THOSE PARTS.

NARRATION (VO) :

THE BOARDS WHERE THE KANBANS ARE HUNG ARE MADE AS VISUAL AS POSSIBLE. THIS WAY ANYONE CAN SEE FROM A DISTANCE THAT EVERYTHING IS RUNNING SUCCESSFULLY, OR, IF THERE ARE PROBLEMS.

NARRATION (VO) :

ARIENS USED TO HAVE THE PROBLEM IN THE METAL FABRICATION AREA OF NOT HAVING ENOUGH WIRE BASKETS TO HOLD PARTS BECAUSE THEIR BASKETS WERE ALWAYS FULL.

NARRATION (VO) :

WITH KANBAN IN PLACE AND LESS INVENTORY ON HAND, ARIENS HAS BEEN COLLECTING AND RECYCLING MANY OF THE OLD BASKETS.

NARRATION (VO) :

WHAT ARE SOME INTANGIBLE BENEFITS KANBAN HAS PROVIDED FOR ARIENS?

JEFF HEBBARD 05:26:51 till 05:27.21 at the beginning it was, they really didn't believe and there were concerns about all the problems that "It" may cause, and until we successfully started to see that the expediting started to go away, the parts flow problems to assembly started to go away, that it was easier to visually control than it was than try to manage on a computer. Once they started to believe, now I got to the point they want to see us go faster and put everything on Kanban.

NARRATION (VO) :

WHAT ARE SOME OF THE KEY LESSONS THAT ARIENS HAS LEARNED ABOUT KANBAN?

JEFF HEBBARD 05:32:27 till 05:33.05 A really important lesson is always start as close to your customer as you can and work your way backward and you start in your shipping dock and you work your way to assembly. And from assembly you work to wherever your supermarket is for purchased parts, then it's time to go back to the supplier. And if you don't do that you don't know what you are really asking for. Now we know we want all purchased parts in two hour kits for every cell. So we can define the shape size and look of what we are really asking for. We can go back to the supplier and say this is what we really want. How close can we get to that?

NARRATION (VO) :

KANBAN HAS CHANGED THE FOUNDATION OF MATERIAL FLOW AT BOTH ARIENS AND CARVER.

THERE IS NO ONE SYSTEM THAT FITS ALL APPLICATIONS BUT THE RULES ARE THE SAME EVEN THOUGH THE CONTAINERS, TICKETS, AND PARTS ARE ALL DIFFERENT. MAKE THE SYSTEM SIMPLE, VISUAL AND THEN WORK TO ELIMINATE THE NEED FOR KANBAN. AT THE VERY LEAST WORK TO MINIMIZED THE QUANTITY.

NARRATION (VO) :

TO REALIZE THE JUST IN TIME RESULTS OF A KANBAN SYSTEM, THERE ARE SIX RULES THAT

MUST BE FOLLOWED:

NARRATION (VO) :

RULE ONE: THE DOWNSTREAM PROCESS SHOULD WITHDRAW THE RIGHT PARTS OR PRODUCTS FROM THE UPSTREAM PROCESS AT THE RIGHT QUANTITY AND AT THE RIGHT POINT IN TIME.

-THE IMPLEMENTATION OF THIS RULE WILL CHANGE THE FLOW OF PRODUCTION, TRANSPORTATION AND DELIVERY OF MATERIALS THROUGHOUT THE ORGANIZATION. THIS MUST BE COMMUNICATED AND THE NEW ROLES MUST BE UNDERSTOOD AND PLANNED CORRECTLY.

THERE ARE A FEW SUB-RULES THAT RELATE TO THIS FIRST RULE:

-ANY WITHDRAWAL WITHOUT A KANBAN SHOULD BE PROHIBITED.

-ANY WITHDRAWAL WHICH IS GREATER THAN THE NUMBER OF KANBANS SHOULD BE PROHIBITED.

-A KANBAN SHOULD ALWAYS BE ATTACHED TO THE PHYSICAL PRODUCT.

NARRATION (VO) :

RULE TWO: THE UPSTREAM PROCESS SHOULD PRODUCE THE PARTS OR PRODUCT IN THE QUANTITIES WITHDRAWN BY THE DOWNSTREAM PROCESS.

WITH THE IMPLEMENTATION OF THESE FIRST TWO RULES, THE ENTIRE PRODUCTION PROCESS BECOMES LINKED LIKE A CHAIN. ONCE THE CUSTOMER PULLS ON THE LAST LINK, THAT IS THEY BUY A PRODUCT, THE ENTIRE CHAIN PULLS FORWARD TO RESPOND TO THE CUSTOMER DEMAND.

THERE ARE A COUPLE OF SUB-RULES ASSOCIATED WITH THIS:

-PRODUCTION GREATER THAN THE NUMBER DEFINED BY THE KANBAN IS NOT ALLOWED.

-WHEN DIFFERENT GROUPS OR SERIES OF PARTS ARE TO BE PRODUCED IN UPSTREAM PROCESS, THEY SHOULD BE PROCESSED IN THE SEQUENCE THE KANBAN WAS DELIVERED.

NARRATION (VO) :

RULE THREE: DEFECTIVE PRODUCTS SHOULD NEVER BE TRANSPORTED TO THE DOWNSTREAM PROCESS.

-THE ENTIRE FOUNDATION OF THE KANBAN SYSTEM IS DESTROYED WHEN THE DELIVERED PARTS ARE DEFECTIVE.

NARRATION (VO) :

RULE FOUR: THE NUMBER OF KANBANS SHOULD BE MINIMIZED.

-REMEMBER THE BEST KANBAN IS NO KANBAN. SO AS THE LEAD-TIME IS REDUCED, SET-UP TIMES REDUCED AND SINGLE PIECE FLOW IS IMPLEMENTED, THE NUMBER OF KANBANS MUST CONTINUOUSLY BE RE-EVALUATED AND REDUCED.

NARRATION (VO) :

RULE FIVE: KANBAN CAN BE UTILIZED TO ADAPT TO SMALL VARIATIONS IN PRODUCTION VOLUME.

VARIATIONS OF 10% OR LESS TYPICALLY CAN BE MANAGED BY THE KANBAN SYSTEM.

NARRATION (VO) :

RULE SIX: THE ACTUAL QUANTITY OF PARTS CONTAINED IN A BIN, BOX OR PALLET MUST BE EQUAL TO THE QUANTITY WRITTEN ON THE KANBAN.

THESE SIX RULES SEEM VERY SIMPLE IN NATURE. HOWEVER, AS THE PROCESS IS IMPLEMENTED IN THE REAL WORLD, THERE ARE A NUMBER OF REASONS WHY THESE SIMPLE RULES ARE NOT FOLLOWED.

IT IS IMPORTANT TO UNDERSTAND THAT THE KANBAN SYSTEM WILL **FAIL** IF THESE RULES ARE NOT ADHERED TO AND THE BARRIERS TO FOLLOWING THEM ARE NOT REMOVED.

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