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SEMINAR ON VALUE ADDING MANUFACTURING

VAM

By

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for

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1) Introduction

- Presentation of Steve Woloz and Associates Inc.
- Presentation of the speaker
- Outline of seminar

2) Definitions

Just-in-Time is the capability to manufacture the required product at the required time in the required amounts, therefore in-time receiving of raw materials, for in-time production and in-time delivery to clients. Although there are many variables involved, the critical one is delay or leadtime at all levels. This means:

Shorter delays

Small lots, ideally one piece at a time

The capacity to produce a little of everything every day

Overproduction is just as bad as underproduction

Just-in-Time rests on two pillars:

- **VAM**
- **Kaizen**

Value Adding Manufacturing (VAM): a management philosophy of continual improvement, through the identification and the progressive elimination of all wastes (**MUDA in Japanese**) in manufacturing related activities, i.e. non-value adding activities. A value adding activity is:

- An activity that transforms the product (transformation, processing)
- An activity or a feature of the product that the client is willing to pay for
- Example: W/Bra and serging of jersey cups in style 1137
- Example: DR and leather goalie pads

Kaizen: Kai (to change); Zen (for the better). A **Kaizen** is an approach consisting of creating a multi-task group of persons (including workers) to improve an existing process by **small, quick and inexpensive changes, without major investment.** Since the workers are involved, they are not bent on returning to the production floor with the intention of proving that the consultant or management is wrong.

Example of process efficiency in pant manufacturing

Definition: the sum of production times of non-parallel value adding operations

Pant production

- Select raw material and trim: 20'
- Spread: 100'
- Cut manually: 100'
- Number plies: 60'
- Bundle: 60'
- Sew, press and finish: 25'/85% efficiency = 30'
- Total production time: 370' or 6.2 hours

Normal throughput time: 3 weeks or 120 hours

Efficiency of process

Production time (value adding time)
Total throughput time

6.2/120 = 5.2% (but we quote 85%)

A new concept: Cost/VAH (versus Cost/SAH)

Cost/SAH: cost per standard allowed hour

Cost/VAH: cost per value adding hour

Example for pant sewing

- Cost/SAH
  - SAM: 25’
  - Average hourly salary: $ 9.00
  - Plant efficiency: 85%
  - Excess costs: 17%
  - In 1 hour an operator will produce: 1 x 85% = 0.85 standard hour
  - Cost/SAH: ($ 9.00 x 117%)/0.85 hour = $ 12.38
- Cost/VAH

  In a pant of 25’ of standard time, the non value adding operations could be identified as:
  - Bundle handling: 40 operations x 0.04’ per garment = 1.60’
  - Match fronts and backs: 0.25’
  - Trim and inspect: 1.25’
  - Underpressing: 0.50’
  - Total: 3.60’
  - Value adding standard time: 25’ – 3.60’ = 21.4’
  - Real efficiency: 85% x (21.4’/25’) = 72.8%
  - Cost/VAH: $ 12.38 x (85%/72.8%) = $ 14.45

If other non-value adding operations are added, like extra trimming around the waistband or extra bundle handling, or extra underpressing, the Cost/SAH will not increase (both cost and SAH increase), but the Cost/VAH will increase (the cost increases but not the VAH).

Just-in-time flow production	Traditional lot production
Produce when needed	Produce to keep the factory working and achieve a high efficiency
Produce a little of every style every day	Produce large lots of the same style one after the other
Increase flexibility and lower stocks to respond rapidly to demand	Create important stocks in finished goods to respond to demand
Process order immediately	Group orders to have big lots
Lower set-up times to have small lots	Have big lots to absorb set-up times

3) Identification of wastes

3.1) Waiting

Products waiting to be processed

Needed operator waiting for work: unbalance, machine breakdown

Bottleneck machine waiting for work: machine breakdown, set up time

Causes

- Bad planning: lots put aside and replaced by others
- Bad balancing and production control
- Bad maintenance
- Individual piece work which needs a lot of in-process inventory to balance:
  - To keep the operators on one job
  - Only one person does the balancing: the supervisor

3) Identification of wastes

3.2) Stock or inventory

Raw material, final

Cause: the traditional lot production system

The Toyota vision of inventory: stock is the greatest symptom of problems. By decreasing inventory, the problems appear and thus can be corrected.

The results of inventory reduction

- On the product
  - Better quality: less defective units produced when a quality problem is detected
  - Better design: quicker feedback to design and pattern making for concept corrections
- On the price and cost
  - Higher profit margins: less investment in inventory (raw material and labor); less overtime due to late or urgent orders, or due to orders that were produced out of sequence and had to be put aside
  - Lower investment per unit sold: fewer fires to fight, fewer chances of producing the wrong thing, thus need of less capacity, space and equipment to catch up
- On responsiveness
  - Greater respect of delivery dates: with less inventory, forecasts become shorter term and more precise; only the needed orders are in process
  - Shorter quoted lead time

The consequences of excess in-process inventory

- Damaged goods, soiled goods and high cost of cleaning
- Lost parts
- Handling costs: store, get, displace
- Cost of keeping track of the inventory: paper work, input in computerized system
- Space

The consequences of excess inventory in finished goods

- Mark-downs
- Unsold goods
- Space and rent costs

3) Identification of wastes

3.3) Overproduction

Definition: the manufacturing of products that are not sold immediately or of components that are not going to be used immediately

Principles of JIT: put off until tomorrow what is not essential for today; when the production plan is reached, stop and do something else, i.e. transfer operators

Cause: the traditional lot production process where we want to keep the operators busy on the same operation so that they reach a high efficiency

3) Identification of wastes

3.4) Transportation

From one workstation to another

From one area of the factory to another

From one plant to another

Causes

- Bad layout
- The traditional lot production system

3) Identification of wastes

3.5) Handling

At the workstation: bad methods

Bundle handling

Handling stock

3) Identification of wastes

3.6) Space

Space used for inventory

Measure productivity in garments produced/square foot (meter) or SAH/square foot (meter)

3) Identification of wastes

3.7) Rework

Cost of repairing defective products

Production lost

Delays incurred

3) Identification of wastes

3.8) Inspection

A necessary evil?

An important cause: the individual piece work system

3) Identification of wastes

3.9) Poor working methods

Unnecessary steps that add cost and not value

Unnecessary movements

Causes

- Not made under the principles of motion economy and ergonomics
- Inadequate design due to the absence of participation of the production department in the development process
- Caused by a product feature that the client is not willing to pay for

3) Identification of wastes

3.10) Unutilized creativity

Of everyone, including workers

Cause: the individual piece work system

3) Identification of wastes

3.11) The table of value adding activities in the plant

Definitions and presentation

4) General benefits of VAM

Reduction of total manufacturing cost: not necessarily of standard direct labor cost but significant impact on the reduction of indirect labor and overhead

Increase in quality and reduction of costs due to non-quality

Reduction in manufacturing and delivery time: quicker response

Reduction of inventories

Raw material

In process

Finished products

Possible reduction of space, though some layouts in modular environments require a high percentage of spare machines

Reduction of machine breakdowns

Reduction of absenteeism

Reduction of personnel turnover

Facility to plan, balance and control

Ability to do small runs and repeats

Long term gains in productivity due to employee involvement

5) The tools and techniques of VAM

5.1) Process analysis

Map the process precisely, including the transportations and the waiting

Question all the steps in the process

Redefine a new process

5) The tools and techniques of VAM

5.2) Group technology: modules or cells

The only way to reduce leadtime

Skill centers

Skill center: a group of workers with one type of equipment (overlocks for example) and performing various operations with that equipment; garments are transported from one center to another and have to go through all the centers to be completed

- The progressive bundle system is a super specialized skill center arrangement where workers only perform one specific operation with the equipment

Modules or cells

- Module: a small self-contained groups of workers having all the necessary equipment to completely manufacture a product; often (but not always) in a "U" shape, to create the feeling of space ownership and a sense of responsibility

Advantages of modules

Reduction of leadtimes

Since leadtimes are reduced and the modules can produce small orders, the Master Production Schedule is not based on long-term forecasting anymore but on short-term actual orders, which reduces uncertainty in planning

The output and delivery of orders can be predicted to the hour

Note: some modular setups will require more spare machines than the traditional sewing process (skill centers). But the reduced investment in inventory support will compensate for the added investment in machinery.

Good if

- Many orders are produced simultaneously, where the production plan is long to make and the execution of the plan is complex
- High excess costs in the factory
- Need for quicker deliveries
- Operators already know many operations and often change

New roles

For the operator

Use of the correct method

Self control in quality

Empowerment: responsible for line balancing

Flexibility

Autonomy

Creativity in ways to improve harmony, productivity and quality in the module

For the supervisor

Planning

A facilitator more than a controller: does not intervene much in the module if the goal is achieved

Manages people more than production

Promotes harmony

Production and productivity controls

The purpose: to inform the group on its progress

The controls have to be visual

Planning of a module: 2 types

- Sit-down with inventory between workstations
- Stand-up without inventory between workstations

5) The tools and techniques of VAM

5.3) Bottleneck elimination

Different solutions

- Stagger break and lunch periods so that the bottleneck operation continues working during those periods
- Modify the working hours
- Control quality before the bottleneck operation so that the bottleneck only works on good products
- Apply the doctor-nurse principle: have some simple parts of the operation done by other workers or operations to decrease the time of the bottleneck operation
- Put a manual machine to alleviate the work content of the automatic one even if the manual machine is slower
- Reduce the set-up time of the bottleneck operation
- Standardization may be one answer even if the SAM is slightly higher

Bottlenecks can vary daily, due to machine breakdowns for example

- Have a reserve of manual machines or spare machines on wheels
- Use a bottleneck ID card as a reminder to the supervisor

5) The tools and techniques of VAM

5.4) Reduction of set-up times (SMED: Single Minute Exchange of Dies)

The excessive time required for set-ups is in fact at the very core of lot production.

In the needle trade, the retraining time involved in the production of small lots is also a major factor for the lot production environment.

The objective is to do more set-ups and thus produce smaller lots.

Example of set-up times:

Fabric is being prepared for spreading

The next spread is being prepared for the NC cutter

A sewing machine is being modified: SPI, thread color, different folder, different presser foot

The stitch length is being modified on a welt pocket automated machine for a different pocket length

A different die is being installed on an automatic jeans pocket setter

A reorganization of the machines in a module is being carried out in order to produce another style

The reduction procedure is the application of the principles developed by Mr. Shigeo Shingo:

Definitions:

Internal elements: elements that must be done when the machine if shut down

External elements: elements that can be done when the machine is working

The four steps:

Step 1: Separate the internal elements from the external ones (50% overall reduction)

Step 2: Reduce the internal elements (75% overall reduction)

Step 3: Transform the internal elements into external ones (90% overall reduction)

Step 4: Optimize the process with automation (100% overall reduction)

Step 1: Separate the internal elements from the external ones

The steps are

- Form an improvement team
- Film the set-up
- List all the tasks of the set-up and time them
- Separate the internal and external elements with the help of the form: "Study of set-up elements"
- Organize the work so that the external elements really occur while the machine is operating and have the following items readily available in the vicinity of the machine:
  - Tools
  - Fabric
  - Spare machines
  - Clear and precise instructions and specifications
- Apply the doctor-nurse principle to change some of the internal elements into external ones

Step 2: Reduce the internal elements

The steps are

Order the tasks on a time basis and attack those that consume more time: usually 20% of the tasks consume 80% of the time

Use quick disconnects: on the floor instead of 8' high

Simplify fastening methods: wing nuts instead of regular nuts, color coding to identify points of connection, special knot that goes through the needle; painted measures for guide adjustment; machine on casters; individual thread racks with the necessary thread colors; many bobbins per operator with different colors; clip-on extensions for sewing tables

Use flexible attachments: swing away guides and folders, turret with 3 pivoting presser feet

Train the operator in doing part of the job or all of it instead of waiting for the mechanic or the supervisor (changing and adjusting folders for example; adjusting thread tensions for a new fabric)

Have all the required tools readily available: basic tool kits for the operators

Organize parallel tasks: many persons working simultaneously

Step 3: Transform the internal elements into external ones

Step 4: Optimize the process with automation

This is difficult to do in the apparel trade.

This is the last step because it is preferable to simplify before automating.

5) The tools and techniques of VAM

5.5) Layout technique

The six steps

Chart the relationships

Establish space requirements

Diagram activity relationships

Draw space relationship layouts

Evaluate alternative arrangements

Detail the selected layout plan

5) The tools and techniques of VAM

5.6) Production and stock planning system: Pull versus Push, Kanban system

The production and stock planning system can be divided into two important phases:

1. The planning phase

The objective of this phase is to determine, according to the demand forecasts:

A list of the items to be manufactured: the Demand Forecast

A global capacity plan: the Annual Production Plan

A more precise capacity plan by week, for a certain number of months: a Master Production Schedule (MPS)

A list of the materials to buy and when: the Material Requirements Planning (MRP)

2. The execution and control phase

The objective of this phase is the release of the production plan and the control of its progress

In both of these phases a lot of uncertainty exists because the decisions are taken long before the events occur.

There are two approaches to this type of system: the Push and the Pull.

The fundamental difference between Push and Pull is mainly found in the execution and control phase.

With Push, the execution phase is ensured by a work order system given to cutting and purchase orders issued by the office. Push is more often associated with the traditional factory using skill centers and production lots.

With Pull, the execution phase is ensured by a Kanban system without office intervention. Pull is more often associated with the modular production system.

The Pull system

The Pull system is used to establish the link between the production modules, in order to inform the **previous** module of the work to be accomplished. Thus the work order would be given to the last assembly module and not to cutting. It is not used between the operations in the modules.

Therefore, before this last module, a minimal stock is required for each of the pieces used in each of the articles that the company produces. These stocks are managed by cards called Kanbans. When the stocks decrease below a certain point, the Kanban card is transmitted to the previous module, which acts as an order request, without the intervention of the office. The quantity to be manufactured is identified on the card. The Kanban card comes back to the original module with the parts from the previous module (this is the one-card Kanban system, which is used in a plant where modules are close by, as in apparel).

If distances are very large, then a two-card system is used, with a Transfer Kanban and a Production Kanban. The Kanban system is thus a communication technique to easily transmit the supply needs.

The system can function between all the modules in the factory as well as with the suppliers.

It is a system that can be compared to a supermarket where the shelves are filled according to what the consumers buy.

The Pull system requires having parts of every product made and ready to assemble, thus limited to a stable product, without many variations. This is of course difficult in the apparel trade due to fabric varieties (often one shot deals) and the number of sizes. It also requires the capability of making small lots.

Within each module though, the Push system is used from the first machine to the last, and the Pull system is only used between the different modules. If the Pull system was used within the modules, there would have to be a stock of each of the parts in front of every machine, which is of course unthinkable.

The operator who follows another operator can only work on what the previous one sends him. But between operators, a buffer zone can be planned with a limited amount of products; when the zone is full, the previous operator stops producing in order not to build unnecessary inventory. This zone is called a Kanban square and serves to control the Push system. The Kanban square must not be confused with the Kanban system between the modules, which is the true Pull.

Thus the Pull system simplifies the controls and paperwork between the different modules or sections in the factory, and decreases uncertainty in production planning and control, as stated in the previous section on Group Technology.

In an apparel factory, the Push and the Pull systems can coexist:

- Standard parts in Pull
- Customized parts in Push

Thus a plant can be modular and have reduced leadtimes and still function in Push, which is excellent: we are talking here of the improved Push system. In such an environment, the distinction between Pull and Push becomes almost irrelevant.

5) The tools and techniques of VAM

5.7) Total Productive Maintenance (TPM)

The purpose of total productive maintenance is that each piece of equipment must always be available when it is needed for production: each machine must be inspected and repaired at specific and planned intervals (anticipation of breakdowns).

The key to success:

A complete involvement of the machine operator: a lot of adjustments can be made by the operators, without tools or with a screwdriver at the most (mostly thread tension problems)

A thorough understanding of the machine

A training program: for the operators, the supervisors and the mechanics

Gathering of data by machine

If a breakdown occurs, ask why until the root cause is found: never be satisfied with the first answer which is rarely the real cause of the problem

Major causes of breakdowns and their solutions

Cause of breakdown	Solution
Failure to maintain the fundamental needs of the machine: cleanliness, lubrication, keeping bolts tight, belt tension, folder adjustment; this represents 80% of all sewing machine failures	Train the operators to perform part of these duties on a daily basis and reserve time at the end of the day to do so: give the operator or the group the responsibility of the machine. Institute a preventive maintenance program with cards and a maintenance schedule for every machine, to be performed by the mechanics outside of factory working hours. Define the roles of the supervisors, the operators and the mechanics in the case of machine breakdown
Failure to maintain the normal operating procedures: speed, thick fabrics	Refer to machine manufacturer's specifications; use correct needle size
Lack of competence of the operator or the maintenance crew	Institute a training program (at the vendor's shop for the mechanics)
Normal deterioration of the machine	Parts to be changed at specific and regular intervals identified by the preventive maintenance program
Design errors of machines (rare in sewing) and attachments like folders and guides	Test folders and guides thoroughly before installing in production

5) The tools and techniques of VAM

5.8) Methods and workplace improvement

The 5 "S"

Sort (Seiri): determine what is necessary and what is useless at the workstation and get rid of the useless

Set in order (Seiton): dispose objects so that they can be easily found i.e. one place for each thing and each thing in its place

Shine (Seiso): keep area ordered and clean

Standardize (Seiketsu): workstations, methods and sequence of activities

Sustain (Shitsuke): be rigorous in maintaining order with constant follow-up and evaluation by employee and supervisor; implement maintenance and cleaning calendar

Motion economy: principles for a good method

Ergonomics: the science of fitting the job to the worker with consideration of

Posture: back, elbows, etc.

Hand and body movements

Lighting

Noise level

Security measures

Predetermined times: a way to define the method precisely (distance codes)

Note on standardization of work: standardize the operator's motions so that he may repeat the same movement and gain practice and speed:

- Thorough methods description
- Written quality specifications

5) The tools and techniques of VAM

5.9) Employee involvement: the Kaizen approach

Employee involvement and contribution for continual improvement must be centered on team work. Each person is affected by the quality of work performed by the others as well as affecting the work of others.

- The best group: members of a cell (they are all interdependent)
- The best means of developing team spirit: request that a group solve a problem that is of special interest to it
- Often, the solution to a problem lies outside the group: form a multi-task group, involving people from other areas
- Do not leave your employees' brain at the door

Approach to problem solving

- Identify the problem
- Set priorities: Problem Frequency Chart
- Identify probable causes
- Organize a study of the probable causes to reach the real causes
- Develop an improvement plan
- Implement the plan
- Follow-up to ensure that the improvements yield the expected benefits

This is the **Kaizen** approach: Kai (to change); Zen (for the better).

A **Kaizen** is an approach consisting of creating a multi-task group of persons (including workers) to improve an existing process by **small, quick and inexpensive changes (no major investment)**. Since the workers are involved, they are not bent on returning to the production floor with the intention of proving that the consultant is wrong.

The steps of the Kaizen approach are

Training on VAM principles

Thorough understanding of how the process works (not demanding outcomes without concern for how): get and analyze data (people are usually not the problem)

Brain storming on the identification of wastes

Elaboration of an action plan

Change and control the process with people, based on data

Use controls as tools for improvement, not to blame people: “what” is wrong should override “who” is wrong

The seven basic rules for practicing Kaizen

Discard conventional fixed ideas about production: think about what you could do if you started from scratch, without the actual constraints (building, attitudes, systems, procedures)

Think of how to do it, and not why it cannot be done: anything can be done

Do not make excuses: start by questioning current practices, ask why five times and seek root causes

Do not seek perfection: do it immediately in small steps even if for only 50% of target

Correct mistakes at once by following up closely on the changes

Do not spend a lot of money for Kaizen (no important investment)

Seek the wisdom of ten people rather than the knowledge of one

5) The tools and techniques of VAM

5.10) Total quality control (TQC) and 6 Σ

Total quality control

A type of organization that will enable each person in a company capable of carrying out correctly the first time and every time an operation that adds value to the finished product (the last part of the objective is very important). Also, the organization will make workers participate in the control of quality, in problem solving and in the implementation of the solutions (the Kaizen approach).

Therefore, it is essential to have a strategy that will:

- Establish the criteria used by the clients to add value to the products (quality is the satisfaction of client's requirements). In a garment:
  - Price
  - Design/look
  - Comfort/usage
  - Durability
  - Ease of maintenance
  - Reputation of maker
  - Availability
- Identify the operations which add value (what the client is ready to pay for).
- Eliminate the operations that do not add value
- Establish and control the procedure of operation for each task that adds value
- Introduce the concept of internal clients: what the team needs from the previous one to do its job correctly (the next team or worker is the customer)

To carry out an operation successfully the first time and every time, it is essential to

- Establish or design the production process precisely: very important for the prevention of problems
  - Method description
  - Machinery and attachment specifications
  - Quality specifications
  - Involve the users (production representatives should be present in any product development committee)
- Control the process at the source
  - Reduce to a minimum the time elapsed between the occurrence of a fault and its detection: modular environment
  - Involve workers to either
    - Stop the operation or repair immediately by the same operator: the operator must be responsible
    - Control by the next operator: never sew over a defect but give it back to the previous operator
    - Easier to do in a modular environment
  - Find the root cause of the problem involving workers, using the techniques of the Kaizen approach
  - Evaluate the impact of the problem on the organization and the cost
  - Correct the problem with a permanent solution and thus improve the process
  - Use anti-error mechanisms: POKA YOKE
    - Sewing guides (always)
    - Folders, ID notches
  - Reduce final inspection and replace by statistical methods
  - Implement an audit based on standards Z1.4 (replacing military standards 105)

6Σ

A methodology to improve the operational process of a company by implementing a system of quantitative measurements based on statistics and enabling it to evaluate, compare, establish objectives and monitor results.

The 6Σ (6 standard deviations) level defines a condition in which only 3.4 parts per million are defective: that is 99.999% perfection. It is not the exercise of daily improvement but the exercise of daily excellence, which begins with the acknowledgement that there really is one right way to run a process.

As an example, the AQL of 2.5% generally accepted in the apparel trade means 25,000 defective part per million and is equivalent to 3Σ.

There are two preparation steps for 6Σ:

- Have **profound knowledge** of the process, both theoretical and practical (Deming):
  - Through technical experts in the company, through the suppliers that created and sold the process, through external consultants
  - This applies to workers as well as managers
  - Two areas: process knowledge, and understanding your goals and key success factors
- Use this profound knowledge to have **process stability** and a full commitment to **daily excellence**
- Note: if the central responsibility of a good manager is to train, coach, and mentor, he (she) has to have a high degree of content knowledge as well as organizational leadership. If not, he (she) will not be able to lead or support the quest for process stability and excellence. This does not mean that the best sewing operator will make a good supervisor but a sewing supervisor who does not know sewing technology will have a hard time.

There are four basic steps in the implementation methodology:

- **Measure** the actual situation and the number of defects: quantitative data
- **Analyze** the problem and find the root causes (Kaizen approach)
- **Improve** the process
- **Implement the controls** that will maintain the results

A simplified 6Σ is simply using the Kaizen approach to solve a quality problem and monitoring the results with data (number of defects for example).

5) The tools and techniques of VAM

5.11) Partnership with suppliers and clients

Elements

- Direct and preferred links with suppliers (EDI or otherwise)
- Fewer suppliers in exchange for higher volume purchases
- Technical exchange
- Short distances between suppliers and manufacturers
- Frequent deliveries and “0” defects

Advantages for the manufacturer

- Better price
- Elimination or reduction of inspection costs
- Continual improvement

Advantages for the supplier

Higher volume of business

Long term guarantee of business

6) VAM in the office

Reducing the leadtime in the administrative processes and in paperwork caused by waiting for:

Processing

Information

Authorization

Transportation of documents

Elements

- Organize work in modules just as in production cells
- Implement visual controls instead of paperwork to trigger events
- Put people close together (in same office)
- The 5 “S” of the office areas
- Apply the doctor-nurse principle

Example: treatment of file in finance

Indicators	Before	After	% gain
Total number of operations	27	20	26%
Number of value adding operations	5	5	
Number of non value adding operations	22	15	32%
Ratio of value adding operations (%)	18.5%	25%	6.5%
Distance in feet traveled by the file	131	99	24%

7) The different approaches of VAM/Kaizen

The **FLO** system: the production process is like a tube where water flows

F: Faults in the tube

- Problem: quality (leaks)
- Solutions
  - Total quality control
  - 6Σ

L: Length of tube

- Problem: long leadtime
- Solutions
  - Just-in-time principles
  - Modular manufacturing
  - Process analysis
  - The Pull system
  - Reduction of set-up times

O: Opening of tube

- Problem: low capacity
- Solutions
  - Bottleneck analysis
  - Methods work
  - Layout
  - Total productive maintenance
  - Reduction of set-up times

8) The different areas where VAM/Kaizen can be applied

- Strategic planning
- Warehouse: layout and procedures
- Inventory management
- New product development
- Production: layout and process
- Administrative processes
- Quick response and throughput time
- Quality issues

9) The implementation steps of Value Adding Manufacturing: the SWA approach

Macro Kaizen with top management, if necessary, to identify priorities: 3 days

Mini Kaizens of employees of various levels: section by section

- General training to cover all employees in groups of 20 to 25: 1 day
- Creation of Kaizen team: multi-task
- Comprehensive training of Kaizen team in the tools and techniques of VAM, with visits on the production floor: 2 days
- Brain storming by Kaizen team, elaboration of an action plan, presentation of plan to colleagues and management: 3 days
- Implementation by Kaizen team: 2 to 4 weeks

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