Journal of Governance and Innovation
Vol. III, No. 2, July-December 2017
ISSN- 2312-5551

# Productivity, not production: To grow in global market n eeds globally practiced Management

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***Abstract***

*Readymade garment industry, the game changer in post liberation economy of Bangladesh is growing up still. Being in second position in worldwide export market, barely adopting the modern manufacturing system. In the management of readymade garment industry, from first line management to top level management synchronization of understanding and adopting modern manufacturing has a tremendous gap. This sector is trying to play at global level with their level of experience from the past instead of adopting management for future. One of the very common thing to do costing, to plan and to evaluate the performance is consideration of production instead of productivity. In my last few years of working experience in this sector, I observed so many factories are even not informed about the term productivity. From early 90's workstudy was introduced in this sector to implement the time-based management. The primary initiative was to convert the base of calculation from overall performance to head wise performance. To evaluate the performance of different sewing line in a factory use of output of per person per hour Instead of hourly or daily output number was the objective. To understand the expense to earn ratio easily, productivity was introduced as a simple tool. Later on SMV (Standard Minute Value), efficiency and others tools were introduced. But here at 2016, so many factories, their top management to first line management are not interested in and/or aware about this management. To grow in global platform, RMG sector must adopt the globally practiced system.*

**Keywords:** RMG - Readymade Garment, SMV- Standard Minute Value, Production, Productivity, Work-study.

## Introduction

In Readymade Garment (RMG) industry, the manufacturing runs in a line according to Product Layout. To understand the performance of an

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industry, line wise performance evaluation is mandatory. A sewing line starts at input area and ends up with output area with proper quality inspection. So, it is very important to evaluate each and every performance based on Key Performance Indicator (KPI). In RMG industry the one of the most important KPI is Productivity. From the 1978 the starting of RMG journey in Bangladesh, people in this sector usually knows Production as the produced garment pieces from a sewing line. It is the common practice to ask about the performance of a sewing line or an industry is "How much the Production". Though production is a number itself, it is not a Key Performance Indicator (KPI). Typically, in an industry, comparison in performance in two lines also measured by the daily output (usually called Production).

**Production**

Literally Production is a process. It is a process that combines couple of inputs both material and immaterial to make some outputs. The output can be a good or service with value. Particularly for Readymade Garment (RMG) sector the output is the quality passed garment and there are several inputs like manpower, machine, raw material (fabric, thread, button, etc.), power, time, and money and so on. There are so many factories who also consider the output from sewing line as Production not even the Quality Passed.

**Productivity**

The productivity is a Key Performance Indicator (KPI) of a production process. It is the ratio of input and output of the process.

Productivity = Output/Input

Productivity can be measured partially and totally. When the output is compared with a partial input like only manpower or machine, is defined as partial productivity. Three types of partial productivity are easily applicable and viable for RMG industry.

1. Labor Productivity = Total Output/Total Number of Labor
2. Machine Productivity = Total Output/Total Number of Machine
3. Energy Productivity = Total Output/Energy Input

To understand the total productivity, the input is usually used which cover the total input. Capital productivity is the proper one to calculate it.

Total Productivity = Total Output/Total Money Input

This monetary input covers total direct and indirect cost. Both partial and total productivity can be calculated for a sewing line and/or for full industry. But as the RMG is a labor oriented industry, labor productivity plays a key role there.

## Performance Comparison Based on Productivity

Daily Output is not a scientific or even proper way to compare. It helps to compare the production lines producing same product. The below example will make a sense:

If two sewing lines, Line A and Line B in an industry are running for 8 hours shift and producing 900 pieces and 950 pieces accordingly. Just considering the output number Line B is performing better. If the number of labors are 50 and 54 accordingly, then labor productivity is 18 and 17.59. Now Line A becomes better and the performance evaluation becomes scientific. But in most of the industry the daily output is only counted. The industries have an Hourly Output Board where only hour wise outputs are being recorded and labor wise hourly output reports are maintained.

## Standard Minute Value (SMV) the Time based Management

Standard Minute Value (SMV) is the time required for a qualified worker working at "Standard Performance" to perform a given task. The SMV includes additional allowances for Rest and Relaxation, Machine Delay and anticipated Contingencies.

In modern business paradigm, every industry use to make product or service but they sell Time. They are paying the employees based on time and also calculating the Cost of Manufacturing based on time. All the products or services are transforming in a Standard Time Value. In RMG sector in Bangladesh, so many factories are practicing to calculate the SMV of their product but till now very few of them are relying on their system.

Standard Minute Values helps the organization to set a time based management. Product turn in time that enables a proper match with Lead Time. Cost of manufacturing (for Garment Industry Cut Make Price) can be calculated based on SMV and Factory capacity can be expressed in available minute so that marketing can be done more precisely.

## Efficiency

Efficiency of a sewing line generally measured by the ratio of Input and Output. To calculate the efficiency of a sewing line, generally input minutes are taken as Input and produced minutes are taken as Output.

Input Minute= Labor worker in a sewing line * Working Minute

Output Minute = Output Garment Quantity * SMV

Efficiency = Output Minute/Input Minute %

Efficiency usually expressing the consumed resources and produced resources. Comparison can be done among any type of product manufacturing sewing line or industry.

## Per minute Labor Cost

Though SMV is necessary to calculate the efficiency, it also used to calculate the per minute labor cost in an industry. The per minute labor cost is the key to calculate the Cost of Manufacturing.

Per minute labor cost = (Wages and Fringe or Social Benefits + Manufacturing Overhead Expenses) of month/(Total Directly Working Minute per month including efficiency)

Wages and Fringe or Social Benefits = Average actual labor monthly wages (direct and indirect without fringe and social benefit) + Average actual monthly Overtime wages + Monthly fringe or social benefits

Manufacturing Overhead Expenses = Variable Overhead costs + Fixed Overhead costs

Total Directly Working Minute per month including efficiency = Working hours per day (expressed per direct labor employee) * Working days per month (expressed per direct labor employee) * Number of Direct Labor Employees * Average production efficiency (expressed as %)

## II Managing Daily Production

Life of a sewing supervisor or line chief of a Bangladeshi RMG industry is difficult. There is severe Bull Whip effect in fixing the daily target for him. Till now most the factory marketing department calculate the Cut Make price based on Man-Machine-Hourly Production. Line target is being set on the forecasting data. So, when the product is entering in a sewing line, the available manpower, available machine or space become minor issues. The prior issue is only to achieve the forecasted target. There is also a huge communication gap between the manufacturing department and the marketing department. The marketing does the costing based on their forecast then planning department add some uncertainty allowance in setting target. So, target becomes something which is difficult to achieve. Then the management usually asked the production management that the forecasted target must be achieved and they should do whatever they need. To make a smooth production management, setting target is very important. Everyone should know earlier what they are needed to achieve.

## Setting of a Target for a sewing line and Marketing strategy

A sewing line is the ultimate place where the core thing takes place. Every industry should align their marketing with the sewing line. The average monthly forecasting system should be based on Total Directly Working Minute per month including efficiency.

Monthly forecast for a line = Total Directly Working Minute per month including efficiency/average SMV of the product.

### *Effect on Line Human Resource Management*

In quantity based allocation, the output target remains nearly fixed and the Input factors vary. The line chief needs to increase or decrease the number of worker in sewing line to ensure the target. Manpower budgeting becomes very difficult for him or Production Manager and for Human Resource Management department also. Production Manager needs to switch the worker frequently from line to line. The switching has two major effects:

a. **Worker Migration:** Workers are usually comfortable with their assigned lined supervisor or line chief and they have a better understanding with them. When they are being switched frequently, they use feel uncomfortable and as a result they migrate.
b. **Effect on Production Incentive Plan:** To implement a group incentive plan to enhance productivity is worldwide practiced tool. It becomes very difficult to implement group incentive plan if frequent switching happens.

### *Effect on Compliance*

Each line has fixed amount of area and each workstation has a fixed required area. When a line management needs to achieve a fixed target, they need to increase the Input. The increase in Input is either the Worker and Machine or the Working Hour. Increase in Worker or Machine requires the space but the space is already occupied. But they need to place those machine or worker then the minimum required space is void. However, keeping the worker or machine number fixed, they need to increase the working hour. This also void the maximum working hour limit as the planning is done for maximum allowed working hour.

### Target of a sewing line

Target of a sewing line should have the below criteria:

Target should be achievable

The line management and workers should have confidence on the target

Target should be specific and visible

For a certain period, Target should be declared earlier.

Target once announced should be valid for certain period and not change suddenly

In a sewing line the number of machine and worker must be remain fixed. The Target should vary based on available manpower. Already the available working minute including efficiency has been considered in marketing.

Target of a sewing line = Number of Worker * Working Minute * Expected Efficiency/SMV

## Tracking the daily Improvement

Line chief or supervisor should not track only the Hourly Output of the sewing line; they should calculate the hourly Productivity and Efficiency along with. The production management should compare the performance of the line chiefs or supervisor based on those two KPIs. Achieving the daily targeted quantity is very important to meet the shipment timeline but it also important to know the resources are being consumed to achieve it. It is the high time to make them understand that only the quantity is not the ultimate factor to survive.

## Distribution of Work in the Sewing Line

Work distribution in a sewing line doesn't have any scientific method from the beginning. The layout was based on one worker one process. To balance the line or solving the bottleneck, adding machine, operator or helper was widely used method. This adds value but target was never revised for this adding manpower. SMV based work analysis help to distribute the work based on time of the process. Say a 20 minutes product is distributed in 50 number of workers. So, 0.4 minutes work is allocated for each worker. There may a single task or more than one or two. It creates a sense in the line that every process is important to achieve an optimum output.

## III The CM price

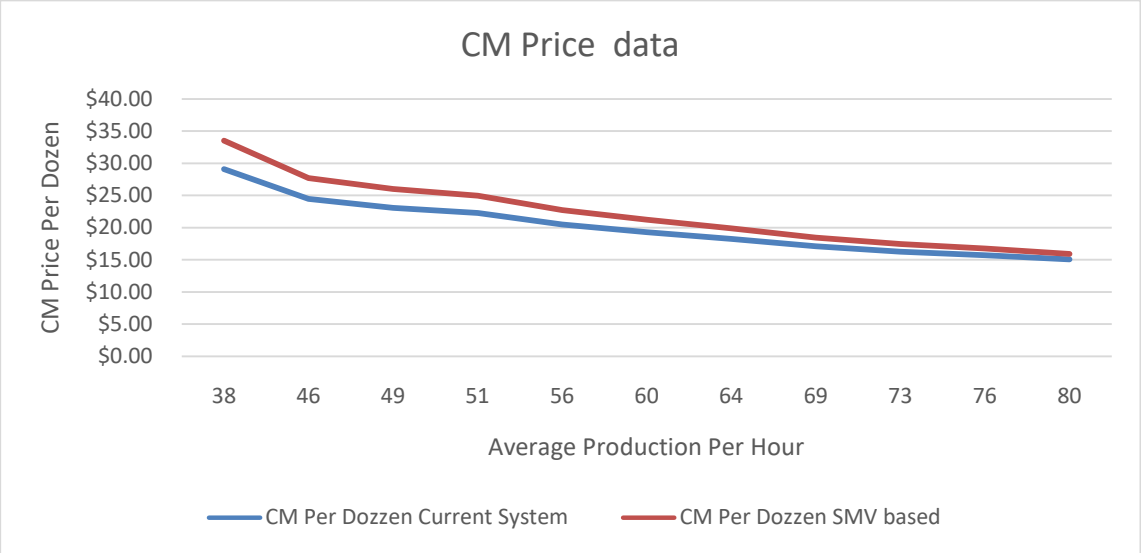
In Garment industry, the CM price is cut and make price. In current system, it is calculated by the Man-Machine-Production per hour. In time based management CM price is calculated based on SMV of the product. Below table shows the difference of CM price by both system:

**Table 1.** CM price data comparison

| | | | | | | Based on Man Machine and Hourly Output | Based on SMV |
|---|---|---|---|---|---|---|---|
| Si | Man | Machine | Production/Hour | SMV | Efficiency | CM Per Dozen | CM Per Dozen |
| 1 | 65 | 50 | 38 | 33.5 | 32.64% | $29.08 | $33.53 |
| 2 | 65 | 50 | 46 | 33.5 | 39.51% | $24.44 | $27.70 |
| 3 | 65 | 50 | 49 | 33.5 | 42.09% | $23.09 | $26.01 |
| 4 | 65 | 50 | 51 | 33.5 | 43.81% | $22.28 | $24.96 |
| 5 | 65 | 50 | 56 | 33.5 | 48.10% | $20.51 | $22.75 |
| 6 | 65 | 50 | 60 | 33.5 | 51.54% | $19.30 | $21.23 |
| 7 | 65 | 50 | 64 | 33.5 | 54.97% | $18.24 | $19.90 |
| 8 | 65 | 50 | 69 | 33.5 | 59.27% | $17.10 | $18.45 |
| 9 | 65 | 50 | 73 | 33.5 | 62.71% | $16.29 | $17.45 |
| 10 | 65 | 50 | 76 | 33.5 | 65.28% | $15.74 | $16.76 |
| 11 | 65 | 50 | 80 | 33.5 | 68.72% | $15.08 | $15.92 |

When the order quantity is less the production per hour and efficiency also less. The marketing department usual up charged for the garment.

Day by day the customers are shrinking the CM price. They are expecting the more production per hour. In the system production can be vary by piece by piece and so as Man or Machine. One piece production increasing or decreasing one person from the costing system impact to a certain amount. But in SMV based system, expected efficiency is the key factor. It can vary in decimal level easily. However, as the system is directly related to the expense detail of organization, it given the real scenario of CM price. Below chart shows that increasing the production per hour or efficiency is making the difference between the two system:




**Graph 1.** CM price data comparison

When the factory is performing at low level the difference is higher. As a result, every garment industry is interested to have a long order quantity to archived higher production rate. But the reality is the world is fashion trending, various people loves various type of garment. It is hardly seen in a gathering people are wearing similar fashioned garment. They want different fashion. To meet the customer demand and keep wide variety of fashion in the product, RMG chain are shortening the volume per product. This calculation is showing that at low volume order the costing system is not in favor for manufacturing industry.

## IV Role of Industrial Engineering

The basic purpose of industrial engineering can be expressed as ECRS

E = Eliminate. Eliminate the non-value added work which just increased the cost but add no value to the core product. They can eliminate marking job from process by using jig, fixture, template etc. They can also eliminate the unnecessary movement during performing a task by implementing proper work station layout.

C = Combine. Combine the related work together to reduce the in between hidden losses. When any non-value added task cannot be eliminated, it can be reduced by combine with next process.

R = Rearrange. Rearrange of work can give a better work flow. By drawing the product flow diagram of a sewing line, they can easily visualize the flow of product. If there is any back and forth flow exits, can be visualized easily.

S = Simplify. Leonardo daVinci told, “Simplicity is the ultimate sophistication”. To perform in a sophisticated task, the process should be simplified.

To work according to ECRS, Industrial Engineers should focus on Team building first. It is very difficult for a person to be expert on all the department job. A smooth Team work can be the ultimate solution for this.

**The Speed of Trust**

The title is borrowed from Mr. Stephen M.R. Covey. However, the first step of team building is trust. It is commonly seen in garments factory mainly in Knit composite factory, after receiving fabric from textile, the garment making unit inspecting the fabric again. Though both industry owner by same management, fabrics are being inspected twice. It’s just increasing the cost and a result of not having Trust or reliability. If the textile unit becomes trustworthy, the fabric would not wait for re-inspection. There will be Speed in flow, time will be reduced and obviously process cost will be down. Similar thing is also seen in internal supply chain. The store or cutting department is counting their supply while delivery and sewing department also cross checking while receiving. Two workers are counting and counting. Only trust in the chain can eliminate the wide accepted losses.

The main challenge of an Industrial Engineer is to gain the trust of workers and line chief about the SMV. They need to make them understand about SMV calculation, the allowance and rating system or motion system. If the workers and line chief have their Trust on the system, implementation of productivity improvement tools and techniques becomes much easier.

**Choosing the tool to build team work**

The two-clashed clan in the garment industry is Quality and Production. The employees are often call them as Production team and Quality team. They are not a team; they are just a department in Team. Like bowling department in a cricket team, batting department, fielding department or goal keeping, defense, mid fielder, striker in football. The smooth co-ordination of that department can win only. Industrial engineer can play a vital role to form a team within an industry by choosing the right tool.

***Pre-production stage: Preparation of paper layout of new product***

The line chief starts the changing layout having the new product sample in hand. Many factories are focusing on pre-production process to reduce the changeover time and quick ramp up in learning curve. Industrial engineers are making the operation bulletin to help the line chief. But there is a huge gap in understanding level between them. Due to lack of team work, difference happens between the operation bulletin and practical layout. Industrial engineers can easily solve the situation and can easily reduce the changeover time by tuning their work way. Industrial Engineering team of couple of factories in Bangladesh are now preparing the operation bulletin in team consist of Line Chief, Quality Supervisor and Maintenance Person. They use to record all the required issues during the session.

| Process Serial No. | Part | Operation Description | Machine Type | Machine Quantity | Operator Quantity | Helper Quantity | Iron Man Quantity | SMV | Capacity @ 100% | Capacity @ 75% |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
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**Picture 1:** A commonly practiced format for operation bulletin

| Operator's Sl | Operation Description | SMV | Operator's Name | Type of Machine | RPM (Machine Speed) | Type of Presser Foot | Type of Feed Dog | Needle Plate | Needle size | Thread ('s) | Method (guide/folder/ attachment/te mplate) | Number of Standard Sewing Burst (From GSD Standard) | Hourly potential @ planned peak eff% | Daily Potential@pla nned peak eff% | Operator's Required@pla nned peak eff% | Direct Issue (Pcs) | Training Required (Plan) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
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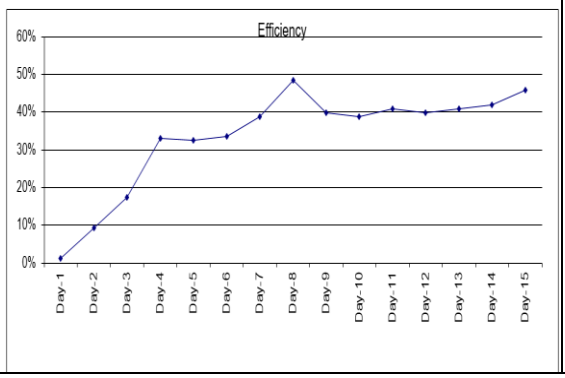
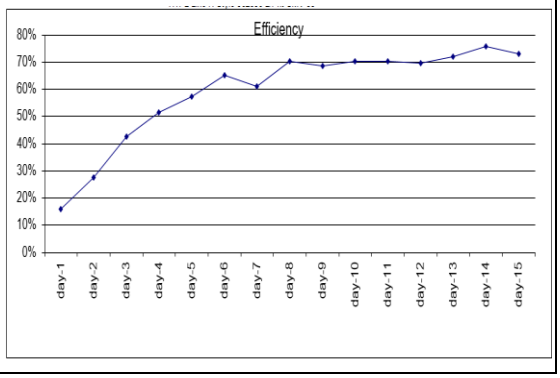
**Picture 2:** the updated format for operation bulletin

In this session, all the related member for manufacturing the new product will be informed earlier, they will plan about what to do. Line chief can select the right worker at right process and can take initiative to spare him/her when required. Offline or online training plan can be done earlier by line chief and quality supervisor. Maintenance person can take proper preparation for arranging machine, folder, jig and other required things.

| *Efficiency graph of a sewing line with common practiced bulletin format* | *Efficiency graph of a sewing line with Updated practiced bulletin format* |
|---|---|
|  |  |

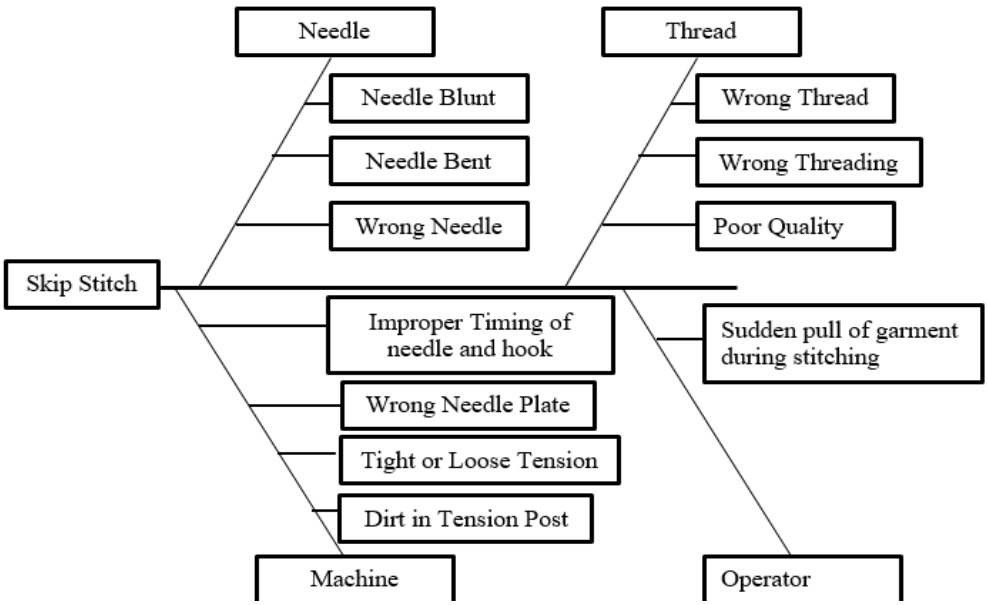


**Graph2:** Efficiency trend comparison

### *Autonomous Maintenance as a Team Building approach to ensure Quality*

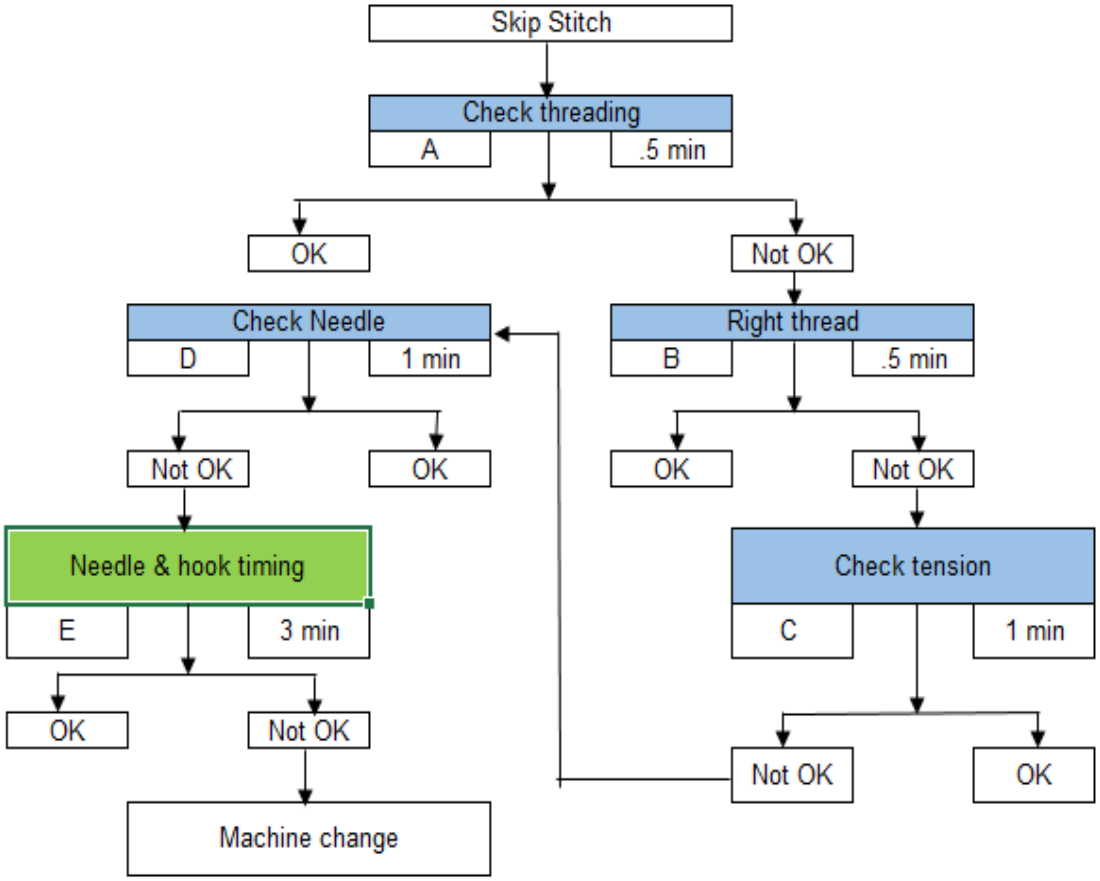
A system where equipment operators learn to perform daily checks, lubricate equipment as needed, replace simple components, perform minor repairs on machines and assist in problem solving. Operators become the early warning systemfor machine abnormalities. Industrial Engineering team can make a team with Sewing line chief, Quality supervisor and Maintenance person to prepare a guideline for autonomous engineering. Firstly, they need to collect the top most problems or defect or damage happening in the factory. Then next step is to make the fishbone diagram for the problem. After that developing of the repairing flow chart and train the operators on that. Thus, solving the quality issue becomes everyone's responsibility.

For an example: Skip stitch on a sewing machine is a widely-seen defect in garment industry. Below figure shows a simple fishbone diagram for skip stitch in a single needle lock stitch machine:




**Picture 3:** Fish Bone Diagram of Skip Stitch

After the fish bone diagram the autonomous maintenance plan flow chart can be developed like the below picture: Cyan coloured box is the responsibility of operators and green box is mechanic's.




**Picture 4:** Flow Chart for Skip Stitch Repairing

This is only possible by a strong team work and well managed training system.

***See the Abnormalities***

Garments industries are well known with the term Defect. They use count a defective garment as a defect. Industrial Engineers should learn to see the Abnormality. Defect is the result of any abnormality. An abnormality causes a Problem and a Problem causes a Defect. Any loosen nut in a machine, vibration beyond normal range, sound beyond normal range, after stitching thread more than allowable length, excess work-in-process and son are common example of abnormality. They should take necessary steps to eliminate the abnormalities from the system. Garments industry is widely except so many abnormalities like more work-in-process, repair work stations, spot removing room, excess cutting in overlock machine, fallen garment on aisles or floor, so many non-value added work like marking job for sewing and so on. Industrial engineer can easily focus on them. They can turn those abnormalities in to stake of money and the money is the ultimate language that everybody understands.

## V The Change in Mind Set the Industry Needs

It is the high time to review the goal of the business. It is not only gradual increasing the export quantity. It's not the increasing production from a sewing line. It is obvious that the goal is to make money. But making money should consider increasing the Net Profit, Increasing Return on Investment and increasing Cash flow. Those three things must happen simultaneously. The management should know the capacity of the organization before marketing. Marketing over the capacity will make the situation worst regarding compliance issue, by increasing administrative cost and making bar to implement so many modern tools and techniques. The performance evaluation at every stage should include reducing wastages in the system. The manufacturing culture should be aligned in a long-term matrix.

***References***

*Stephen M.R. Covey, Rebecca R. Merrill, The Speed of The Trust, The one thing that changes everything. ISBN 978-0-7432-9560-4*

*Eliyahu M. Goldratt , Jeff Cox, The Goal, ISBN 0 566 08664*

*Anand Sharma, Particia E. Moody, The Perfect Engine, How to Win in the New Demand Economy by Building to Order with Fewer Resources, ISBN 0-7432-0381-X*

*http://www.artoflean.com/files/KaizenSession2.*

*Kenneth N. Mckay, Vincent C.S. Wiers, Practical Production Control, A Survival Guide for Planners and Schedulers, ISBN 1-932159-30-4*