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“ENHANCING THE PRODUCTIVITY OF VIBRATING COMPACTOR THROUGH LEAN TOOL: PDCA DEMING CYCLE”

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ABSTRACT

In this day and age, automotive providers and wholesalers have extraordinary worry over improving quality and conveyance and diminishing cost, which result in efficiency improvement. So as to stay aggressive in market, squander (waste) through the value stream strategy must be distinguished and disposed of in order to run the framework and association in most extreme efficiencies. Assembling businesses face cost decrease and difficulties in their operational efficiencies. They generally need to discover a few different ways to limit cost, creation time to dispose of waste so as to improve operational exhibitions and item quality to make due in the present profoundly aggressive world, value stream mapping (VSM) procedure incorporates flowcharting every one of the means, material streams, exercises, interchanges, and the different procedure components that are portions of the change procedure.

I. INTRODUCTION

The company manufactures a few item families. This exploration is centred around the item family which expends over half of complete time. Case New Holland Construction Equipment receives the conventional idea of large scale manufacturing in clusters where the item is created in full limit in spite of the amount of item requested. This makes abnormal state stock, long lead time and a decrease of accessible floor space.

II. METHODOLOGY

The PDCA cycle is the most utilized approach to execute a nonstop improvement system in an organization or association. In this article, we will disclose to you what it speaks to, how it works and what is the association with the PDCA Cycle and some ISO models, as ISO 9001 for Quality Management Systems, in which is referenced as a key standard for the quality nonstop improvement.

- **PDCA Cycle**

The name of PDCA originates from the abbreviation "Plan, Do, Check, Act" (PHVA in Spanish), and is otherwise called the cycle of ceaseless improvement or Deming Cycle (in light of the fact that the name of its creator, Edwards Deming). This philosophy depicts the four basic advances that ought to be done efficiently to accomplish constant improvement, characterized as a persistent method to improve the nature of our items and procedures (decrease failures, increase effectiveness and efficiency, problem solving, avoid potential risks.)

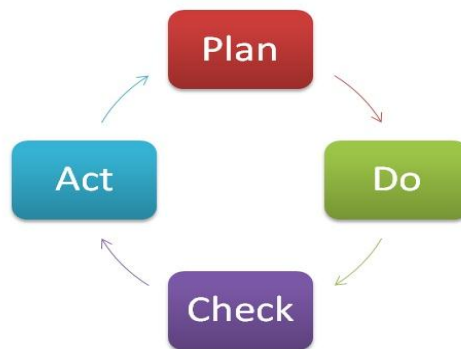


Figure 1: PDCA Steps

The Deming Cycle is made for four cyclic advances, so that once completed the last stage we need to begin again with the first, and rehash the cycle. Doing that in an organization, the exercises are reevaluated intermittently to incorporate new improvements. The use of this philosophy is basically planned to be utilized for organizations and associations, however you can likewise utilize it in some other circumstance.

- **Implementation the PDCA cycle**

The four stages in the cycle are as per the following:

1. Plan: Locate what can be improved, fix a target and consider how this goal can be filed. You can make working gatherings to look through potential enhancements in the procedures and results of your organization. It can tune in to the thoughts of the representatives, and discover better and new innovations that the organization has not utilized at this point.

2. Do: We rolled out the expected improvements to actualize the proposed improvement in our procedures. When all is said in done, it is prescribed to complete a pilot undertaking to test the task before making huge scale changes.

3. Check: Once the progressions are actualized, we set up a time for testing to confirm the creating of the new procedure. In the event that the improvement does not accomplish the underlying desires we should change the procedure again to get the ideal goals.

4. Act: Finally, when the time for testing closes, we need to consider the outcomes and think about the exhibition of our procedures and exercises when the improvement. On the off chance that the outcomes are palatable the enhancements will be executed forever. Notwithstanding, in the event that they are not attractive we should choose whether to roll out more improvements to alter the outcomes or to dispose of them and come back to the begin point.

When finished the stage 4, you need to come back to the initial step intermittently to actualize all the more new enhancements.

III. STUDY OF LAYOUT OF VIBRATORY COMPACTOR SHOP

- | | | |
|--|---|---|
| <ol style="list-style-type: none"> 1. 450 Dx / Ex Machine line 2. 752 Dx/ Ex Machine line 3. IC04 Ex machine Line 4. 1107ExMachineline | } | <p>All 4 types of machine
assy. on same line in same
shop</p> |
|--|---|---|

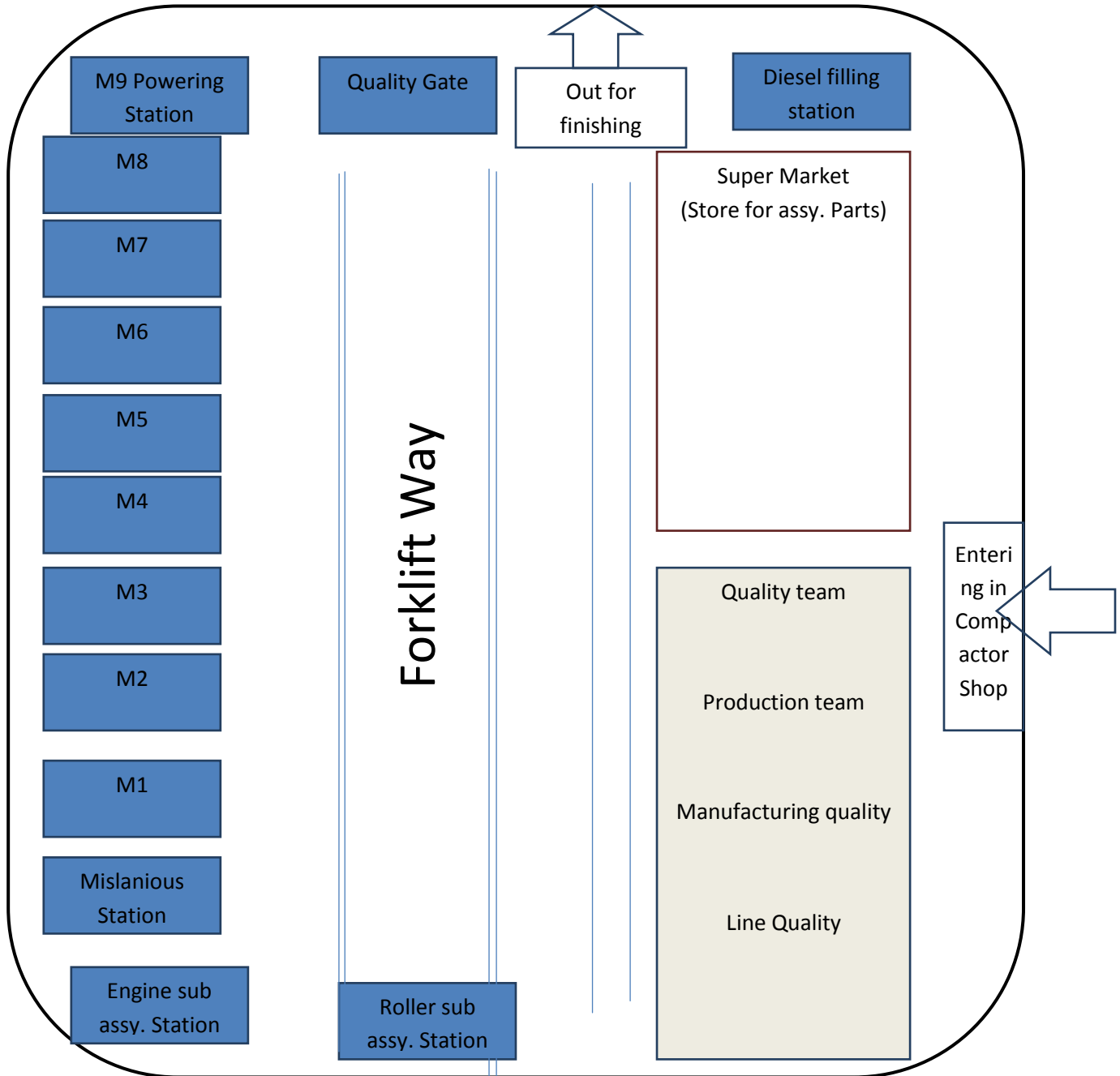


Figure 2: Layout of Shop Floor

III. STUDY OF EXISTING SYSTEM

The work comprises of directing time and movement investigation of gathering and machining activities. By doing this, get together and machining tasks will be institutionalized and generation focuses for every activity will be fixed. Furthermore, Batch handling is changed over in to single piece development by the ramifications of new format (Cellular assembling). This will fill the need of WIP decrease. For the simplicity of administrator development between machines, sitting tasks were changed over in to standing. The specialist multi-skilling is accomplished by the idea of sequential construction system adjusting. As in cellular producing the quantities of administrators are not exactly the quantity of tasks (machines). One administrator needs to perform in any event three to four activities. This will expand

administrator ability. At last, adaptability underway is accomplished by diminished WIP and multi-gifted administrators, who can chip away at different styles right away.

III. ANALYSIS OF THE EXISTING SYSTEM

Analyse all the station for all the assemblies and follow a single model from the initial station to end of the line and observed all the stations with the help of camera, also observed every operators work with the help of time and will try to reduce the non-value added time by which we can increase the productivity.

Non value added work observed in seconds for every operator and for every operation.
Semi value added work observed in seconds for every operator and for every operation.
Value added work also observed in seconds.

Calculate the talk time for every operator as per 8 hour shift.
A operator have 430 minutes means 7hr. 16 minutes by reducing lunch and tea time.
Every day 6 Nos. of machine getting out from the vibratory compactor shop.

Talk Time = Minutes of work divided by nos. of machine production
= 430/6
= 71.66 minutes for every operator for every station

Unbalance time = Talk time – actual time

Table 1: VC running time of 1107 machine for existing system

VC Run hours	
	1107 Machine
Main Line up to M13 (min)	937.90
Main Line up to M13 (hrs)	15.63
Engine SA (min)	243.70
Roller SA (min)	291.20
Tank SA (min)	0.00
ROC SA (min)	23.10
OP SA (min)	161.70
Misc Assly (min)	131.24
Total (in min)	1788.84
Total (in hrs)	29.81

Percentage of NVA(non value added), SVA(semi value added) and VA(value added) process according to all models assembled in vibratory compactor shop. Given below is the percentage Table 2.

Table 2: Percentage of processes of 1107 machine for existing

1107		
NVAA	SVAA	VAA
64%	7%	29%

VI. PROPOSED SYSTEM

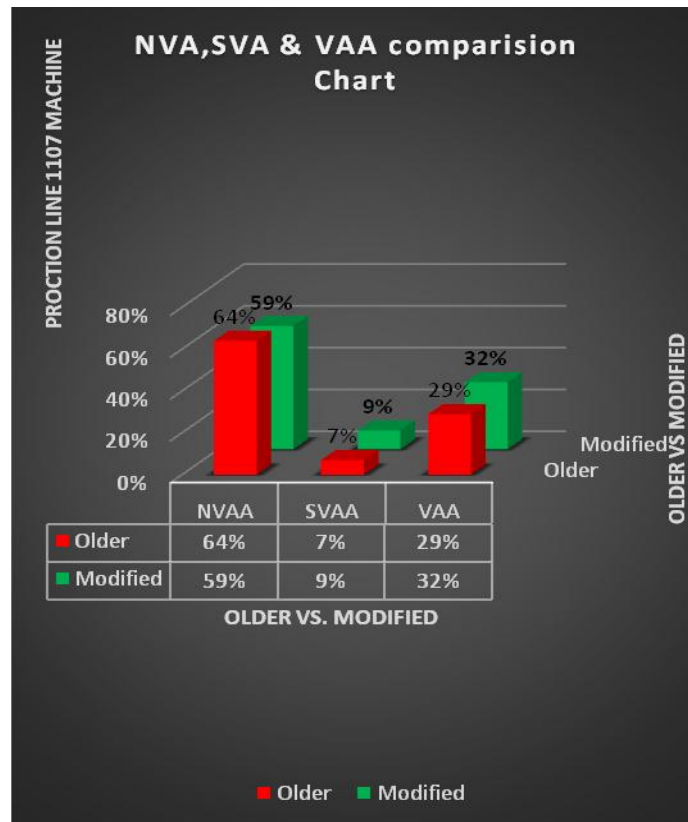
Table 3: VC running time of 1107 machine for proposed system

VC Run hrs modified	
Assembly timings	1107
Main Line up to M13 (min)	781.80
Main Line up to M13 (hrs)	13.03
Engine SA (min)	243.70
Roller SA (min)	291.20
Tank SA (min)	0.00
ROC SA (min)	23.10
OP SA (min)	161.70
Misc Assly (min)	131.24
Total (in min)	1632.74
Total (in hrs)	27.21

Table 4: percentage for assembly of 1107 machine

1107DX Modified		
NVAA	SVAA	VAA
59%	9%	32%

VII. COMPARISON OF EXISTING & PROPOSED SYSTEM



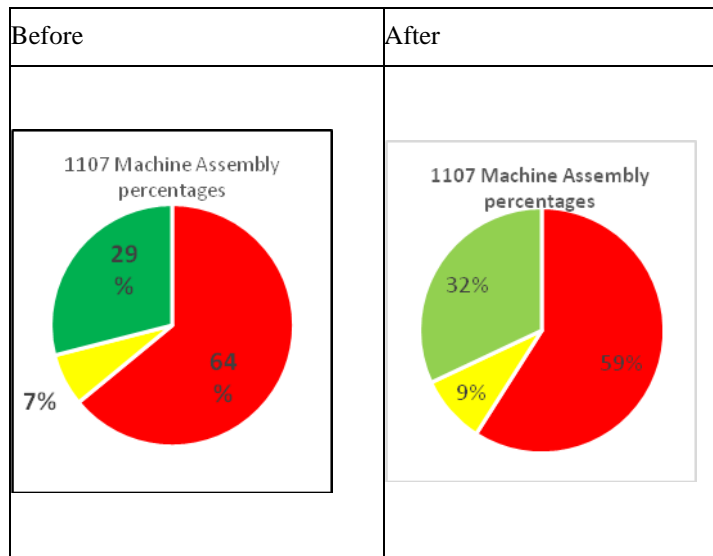
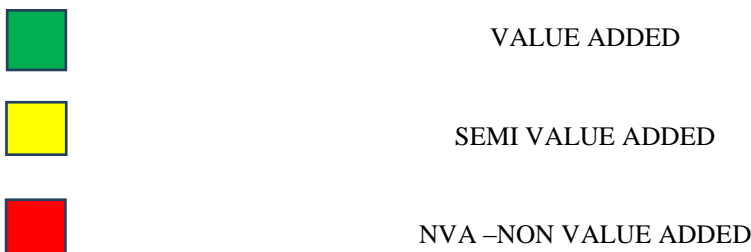


Figure 9 : comparison of percentages for assembly of 1107



With the help of videography we taken the timing of the existing system and then developed the line as planned. Accordingly we got the positive result. We reduced the overall timing of assembly 1107 machine whereas the before duration of overall machine timing was 29.80 Hrs. and after modification we got 27.21 hrs.

Positively we reduced the manpower and non-value added work from the assembly and increase the value added work of the every operator.

VIII. CONCLUSION

In this work at extra parts, the lean assembling devices and systems particularly PDCA were examined and utilized in organization. The issue of group allotment of existing organization is tended to by utilizing single piece development of WIP. This is accomplishing by changing over sitting task to standing and by changing over long sequential construction system in to little work cells, the expected laborer multi looking for appears to be powerful just as correspondence between activities is quick and precise. Different advantages watched are the adaptability of necessity changeover and adjust decrease. Accordingly the underlying presumptions were comprehended by this examination in the organization.

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