Focused Improvement in Real Time

Ivan Djokić [1)]

1) FIAT Serbia

Abstract: *Major companies are using their Production system as a formidable competitive leading edge, with which will provide a major, long lasting contribution to improving Customer Satisfaction. Production intends to play a decisive role in maximizing Company performance in its competitive priorities such as: quality, flexibility innovation and price. The level of performance to be achieved will change according to evolution of the market and competitors and will have to be revised periodically with contribution of all employees.*
Keywords: *Production System, Improvement, Quality*

1. INTRODUCTION

"It is not the strongest of the species that survives, not the most intelligent, but the one most responsive to change."

Charles Darwin /
The Origin of the Species

Today companies are trying to apply various Production Systems in order to achieve goals. Management of company must be persistent in order to reach the high targets.

The system that will be described in this paper is based on systematic attacks on all types of wastes and loses with applying methods and standards with rigor involving everyone.

With this kind of production system company will be highly competitive where:

- the voice of customer is heard in workshop
- leaders have a passion for improvements
- no types of wastes are accepted
- methods for improvements are applied strictly
- all faults are visible
- People involvements are driving force of change.

So companies are sure that production system is the basis of the success.

2.WORLD CLASS MANUFACTURING

World Class Manufacturing, as one of the most known production systems in the world, is a different set of concepts, principles, policies and techniques for managing and operating a manufacturing company. It is driven by the results achieved by the Japanese manufacturing resurgence following World War II, and adapts many of the ideas used by the Japanese in automotive, electronics and steel companies to gain a competitive edge. It primarily focuses on continual improvement in quality, cost, lead time, flexibility and customer service.

The experience gained in analyzing the entire manufacturing cycle of the best companies has led to several key WCM concepts, including four essential ones (Figure 1):

- Total quality control
- Total productivity maintenance
- Total industrial management
- Just in time

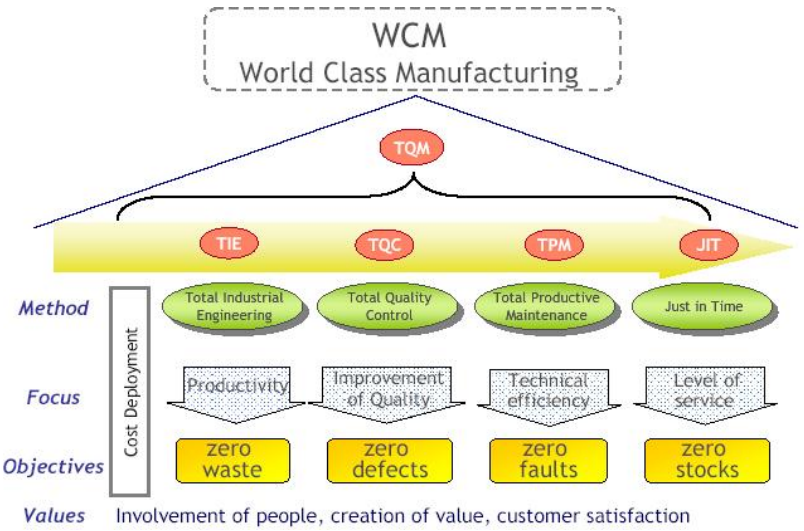

Figure 1 – WCM Concepts

Companies engaging in World Class Manufacturing strategies focus on improving operations, strive to eliminate waste and create lean organizations. This often results in higher productivity. But these companies also focus on speed of total throughput from order capture through delivery setting new standards for delivery without the heavy dependence on inventory.

Instead of conventional reporting, WCM applies Cost Deployment to the decision-making process. Cost Deployment uses systematic analysis to identify the areas and types of waste and losses, enabling the planning and prioritizing of corrective actions and providing a method for evaluating results achieved.

WCM requires the application of methods, tools and standards and culminates in the creation of a system whose workings are visible throughout the factory and clear to all employees. Its effectiveness is based on its objective for simple, practical applications. It recognizes human safety, environmental protection and customer satisfaction among its fundamental values.

All companies in the world that implements WCM at their factories, have ten pillars, which WCM is based on:

1. Safety
2. Cost Deployment
3. Focused Improvement
4. Autonomus Maintenance / Workplace Organization
5. Professional Maintenance
6. Quality
7. Logistics
8. Early Equipment Management
9. People Development
10. Environment

The 7 tools that WCM is using in building of improvements are as follows:

1. Prioritization (Find out important problems)

- Losses translated into money based on cost deployment
- ABC classification
- Pareto diagram
- Stratification
- QA matrix
- Machine breakdown map
- Safety matrix
- Value stream mapping, etc.

2. Systematic, logical and detailed deployment of objectives into right means and right solutions, and measurement of the results against the objectives and targets (to identify where the problem is).

3. Problem description with sketches (Drawing sketches requires better understanding of the problem in detail / to understand the problem.)

4. 5W + 1H (2H) with the 5G principles (Grasp the current situations.)

* Histogram
* Control chart

5. Root-cause analysis (To identify true causes.)

* Cause and effect diagram with a sketch(es) between a probable cause and the effect
* 5 Why analysis
* 4M analysis
* Systematic diagram

6. Phenomena description with sketches (Observe carefully what are happening behind the problem.)

7. TWTTP – Find hidden issues behind the problem.

3. FOCUSED IMPROVEMENT

Focused improvement is the engine of WCM. As the one of ten WCM pillars, FI have a big task to manage the way for improvements in the factory, driven by 5 indicators:

- Number of improvement projects
- Extension of gathered knowledge through the factory
- Involvement of employees
- Benefit / Cost Ratio
- Number of improvement proposal per employee

Most important issue for Focused Improvement is to indentify and solve the root causes of attacked problems in order to achieve the maximum benefit vs cost ratio. In order to achive this FI must try to involve as much people as it is possible so that each person of the different teamworks can acquire methodological know how to adopt the right tools adequate to the complexity of the attacked problem.

Objectives of FI are simple but hard to realise:

- Improve safety, quality and labour indicators.
- Reduce transformation costs.
- Increase the number of the people involved in focused improvement projects.
- Support the horizontal expansion of methodologies.

As all other WCM Pillars and FI activities are based on 7 steps (Figure 2):

1. Definition of model area or machine (Bottleneck process, major loses)
2. Stratification of loses
3. Selection of the project, preperation for deployment
4. Form the team for improvement
5. Project activities with identification of correct method
6. Cost / Benefit analysis
7. Monitoring and horizontal deployment

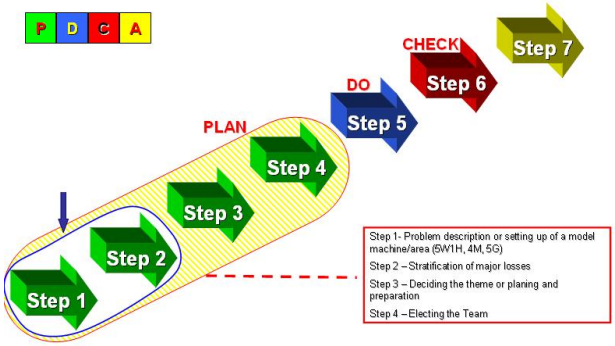

Figure 2 – Seven steps of Focused Improvement

4. IMPROVEMENT PROJECT

As an exemple of Focusd Improvement step 1 here is one exemple of the bottleneck process that is solved by implementing correct methodes and tools.

The managament want to increase production in body shop. FI step 1 says find bottleneck process (Figure 3). Also that is the main source of our losses – step 2.

Then by applying method 5W+1H we can define the problem and get much better knowledge regarding the problem that needs to be solved (Figure 4), and form the team – step 3, 4.

In order to analyze the root cause of the problem we can use 4M analysis (Man – Machine – Method – Material) (Figure 5) – Step 5.

Finaly in step 6 FI is calculating benefit / cost ratio (Figure 6).

Through the example we can see that systematic approach can be very usefull for any demand.

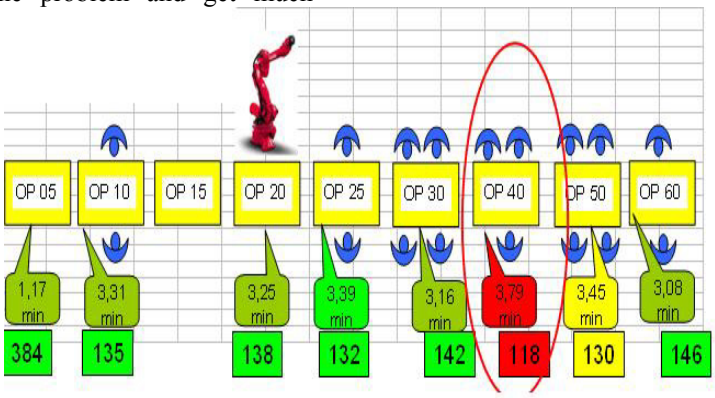

Figure 3 – Bottleneck process

5W + 1H

Fabrika / Shop:	Datum / Date:	UTE:	Projekat / Project:	Tim / Team:
KAROSERIJA BODYSHOP				

Definisanje problema / Problem definition

Šta / What:
Koji proizvod ima taj materijal o kojima se radi? Koje veličine?
Linija zavarene školjke / Body line
Kada / When:
Kada je uočen problem ? U toku proizvodnje kontinualno ili povremeno? U kojoj fazi životnog ciklusa proizvodnje? Pre ili posle promene tipa? U kom satu, u kom periodu?
U toku proizvodnje / During production
Gde / Wher:
Gde je uočen problem (linija, mašina, robot)? Na kom specifičnom delu je uočen problem? Gde je tačno uočen problem?
Linija zavarene školjke / Body line
Ko / Who:
Da li se problem odnosi na specifične mogućnosti? Da li neka specifična ponašanja mogu proizvokovati problem? Samo neki radnici imaju ovaj problem? Problem se pojavljuje samo u nekim smenama? Tehnološki problem, ali ne i konstruktorski problem?
Problem je nezavistan od smene ili obučenosti pojedinca / The problem is indipendent from shift/skills.
Koji / Which:
Koje su karakteristične vezane za problem? Problem se pojavljuje nasumično ili konstantno, ili na povezanost sa nečim? Problem se pojavljuje u određenoj zoni?
Kontinualno / In continuos
Kako / How
Da li je promenjeno stanje opreme u poređenju sa optimalnim u kojima radi? Koliko se često dešava problem?
Oprema nije menjana / Nothing change on equipment

Figure 4 – Define the problem 5W + 1

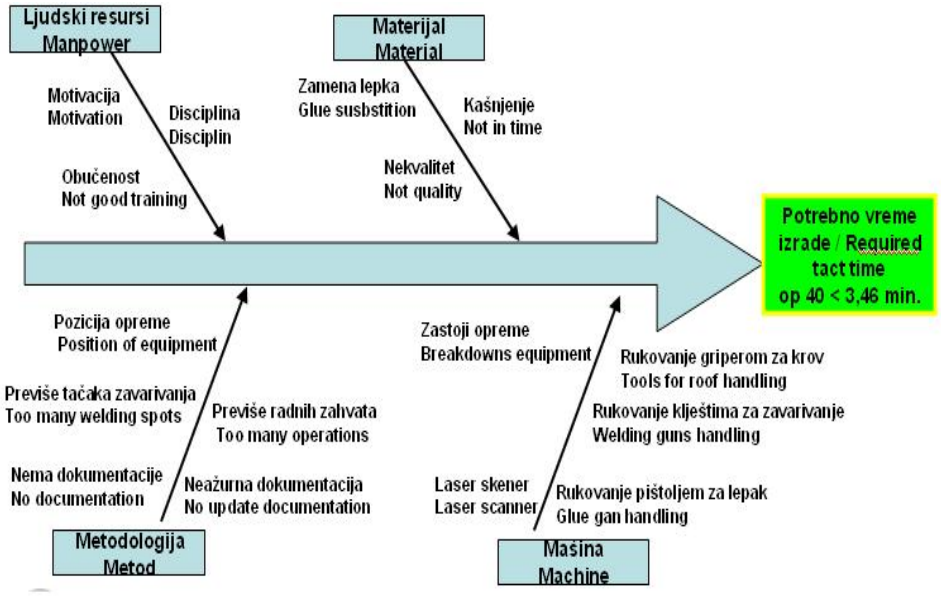

Figure 5 – 4M Analysis (Find the root cause)

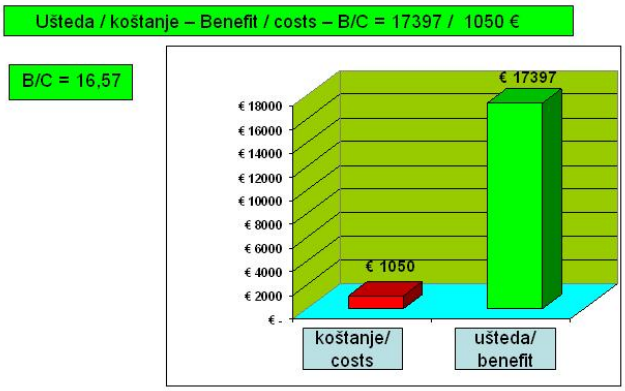

Figure 6 – Benefit / Cost ratio

5. CONCLUSION

Implementation of WCM can increase the capability of a manufacturer to compete with any other manufacturing organization, with the aspiration of achieving world-beating standards in all organizational aspects. World class manufacturing encompasses the practices of total quality management, continuous improvement, international benchmarking, and flexible working.

REFERENCES:

[1] FIAT Group – Manufacturing training unit, "WCM Kick Off", Education Conference in Vrnjacka Banja, November 3-4, 2009, Vrnjacka Banja
[2] FAS – Improvement project – "Increase production", December 2009, Kragujevac
[3] http://dictionary.bnet.com

[4] P.M Andre, N.H. Afgan, M.G. Carvalho , Management System Sustainability (Based on QMS, EMS, H&S and Business Indicators) , International Journal for Quality Research, Volume 3, Number 2, 2009