



# Improve the Productivity of the DEALOx process

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## Abstract:

The demand for DEALOx products has gone up in the market but we have the limitations to increase the DEALOx production capacity ( 5 Mt/Month to 10Mt/Month). Improve the Productivity through DMAIC methodology

**Keywords:** Productivity , demand , increased , limitations, DMAIC

## Introduction

At present we are facing waiting time in DEALOx batch processing. Due to this Inconsistent productivity of the DEALOx process(5~6 Mt/month).

However productivity is less but meets the customer demands. But currently the Organization Goal is revised & product demand is raised up.

Consistent and achieve productivity by 10 Mt/month to meet the customer demands.

## LITERATURE REVIEW:

### 1. Increasing Productivity in a Manufacturing Setting using Daily Process Walks

Nicholas Matey, Nicole Gravina, Bradley Davis, Robert George & Timothy Rosbrook To cite this article: Nicholas Matey, Nicole Gravina, Bradley Davis, Robert George & Timothy Rosbrook (2021): Increasing Productivity in a Manufacturing Setting using Daily Process Walks, Journal of Organizational Behavior Management, DOI: 10.1080/01608061.2021.1897058 To link to this article: <https://doi.org/10.1080/01608061.2021.1897058>  
Published online: 30 Mar 2021.

The work in this paper is focusing is Productivity; feedback; goal setting; efficiency manufacturing. This case study took place at an employee-owned, northeastern metal manufacturer with roughly 80 management employees and 230 union employees. The current study took place at a metal manufacturer and evaluated whether process walk with embedded goal-setting and feedback could increase productivity.

we evaluated the effect of a process walk where the superintendent and supervisor discussed the previous performance and set goals for the next shift's productivity. The method in this paper included the employees Setting and participants , Dependent variables and measurement , Daily process walk (DPW) , Enhanced daily process walk (EDPW),

Experimental design. In this Paper limitation is a data were collected as a case study, and experimental control was limited.

## 2. Productivity Improvement by Reducing Waiting Time and Over Production Using Lean Manufacturing Technique

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The work in this paper is focusing on Productivity, lean manufacturing process. Industry is focusing more on profit and how to profit and health maximization. Lean manufacturing process practice and techniques implementing and reducing waste, waiting time and resource waste elimination. Lean is a team-based approach to identify and eliminate waste through continuous improvement. Any activity that adds cost or time without value to our customers' service is called waste.

The method in this paper included Types of waste Overproduction, Excess Motion, Waiting, transportation, Inventory, defect, over processing elimination and study was conducted in the different departments, and the style and the process flows were observed; the cut parts to packing are preceded. He has two types of data collection: primary and secondary.

After the implementation of waiting time reduction techniques, the production rate is increased, and the productivity loss rate is minimized from 18.5% to 13.88% and reduces the overproduction percentage by implementing lean manufacturing techniques from 6% - 3% in the next order for the same style.

## METHODOLOGY

The Six Sigma methodology is used to Improve the Productivity of the DEALOx process.

### Types six sigma process

1. Six Sigma DMAIC (Define, Measure, Analyze, Improve, and Control) DMAIC is an improvement system for existing processes.
2. Six Sigma DMADV (Define, Measure, Analyze, Design, and Verify) DMADV is an improvement system used to develop new processes or products

I have used DMAIC as an improvement system for existing processes to Improve the Productivity of the DEALOx process.

### Define

- However Productivity is less wrt design capacity but we meet the customer demands as per SCM target.
- Currently customer demands are raised up to 10 Mt/month.

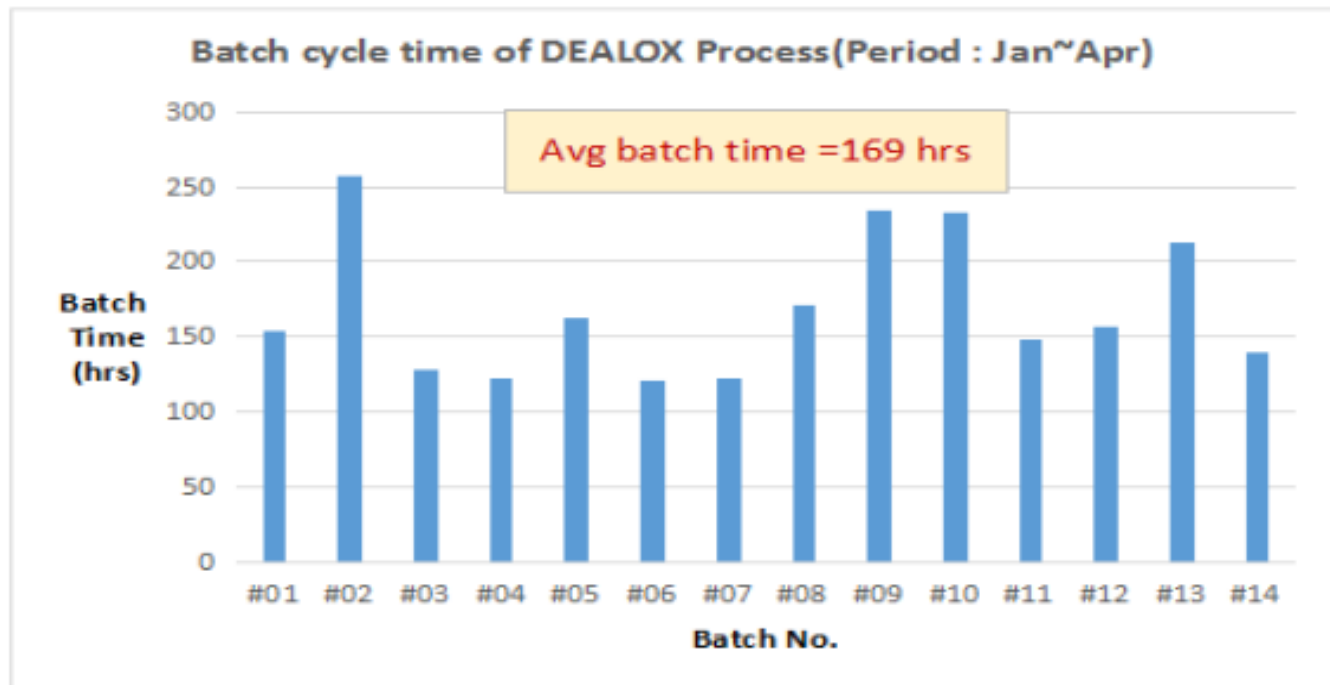
**Problem Statement :-**

At present we are facing waiting time in DEALOX batch processing. Due to this Inconsistent productivity of the DEALOX process(5~6 Mt/month).

However productivity is less but meets the customer demands. But currently the Organization Goal is revised & product demand is raised up.

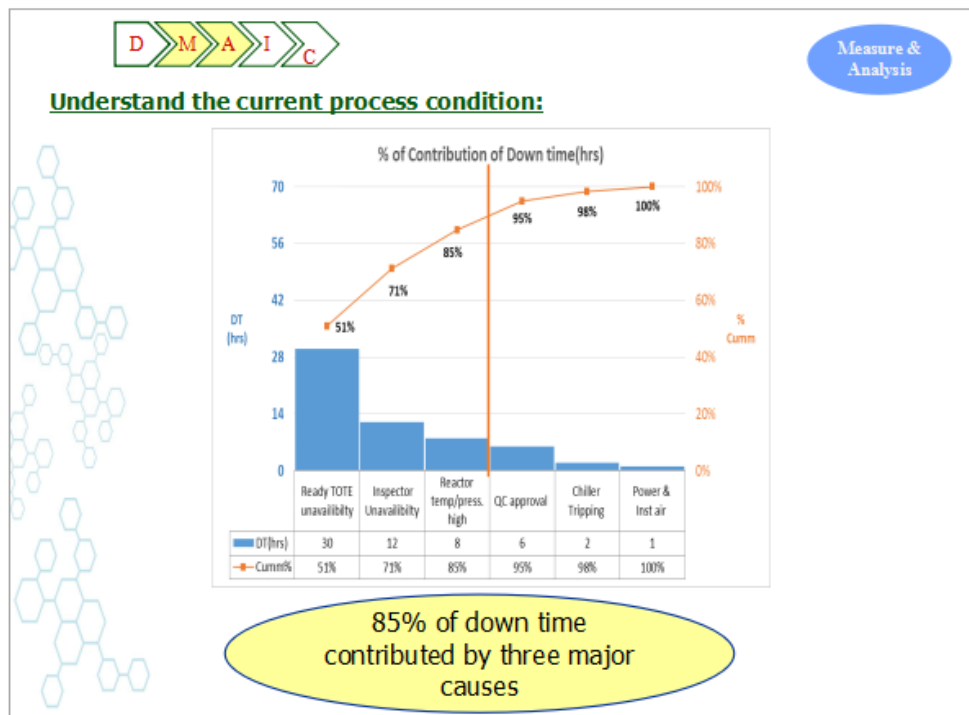
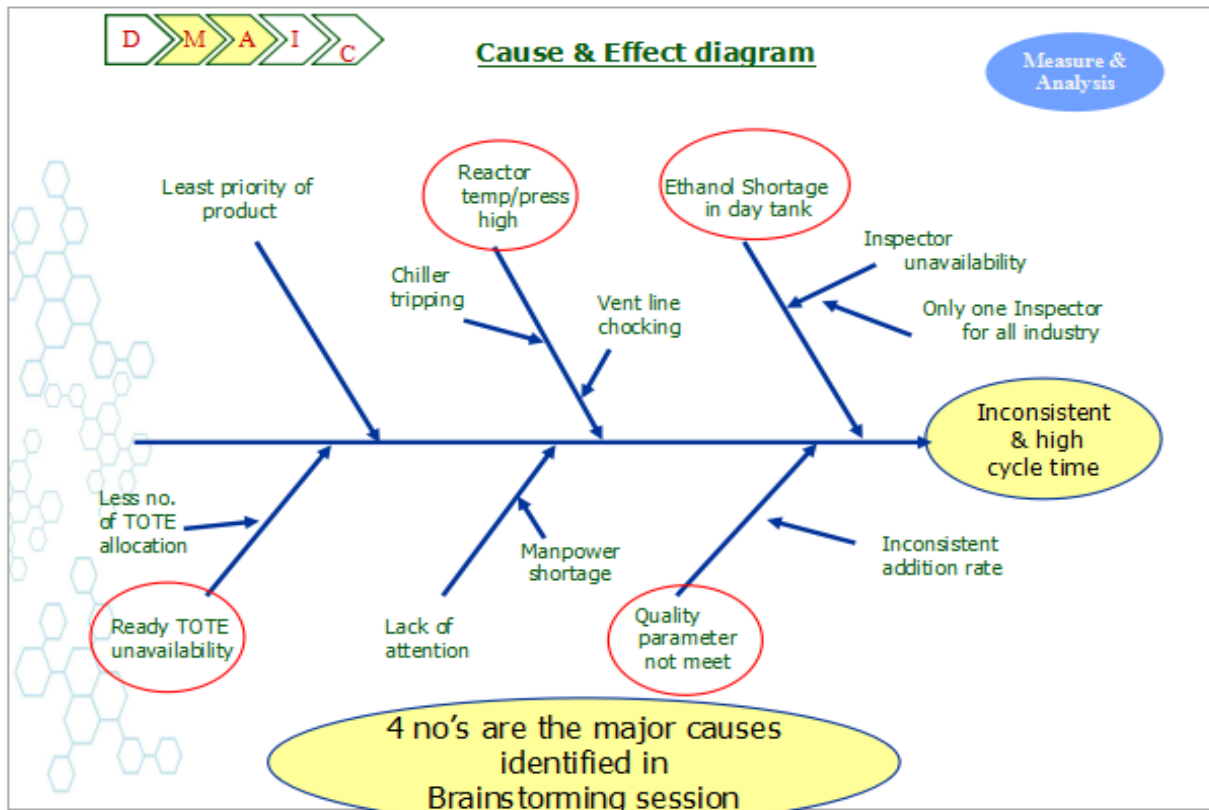
**Objective Statement :-**

- Consistent and achieve productivity by 10 Mt/month to meet the customer demands.

**Measure & Analysis****Understand the current process condition:**

Inconsistent & high  
batch cycle time of process

Cause & Effect diagram



## Analysis of causes:

Cause	Reason	Action plan	Target date	Status
Ready TOTE unavailability	TOTE not handover by LSM or shortage of TOTE.	i) Optimize the TOTE handover procedure. ii) More no. of TOTE allocated for DEALOX.	30-May-22	Done
Ethanol shortage in day tank	Legal Inspector not available	i) Coordinate & follow up with the inspector. ii) Advance planning (Before two days)	30-May-22	Done

Cause	Reason	Action plan	Target date	Status
Reactor pressure high	Vapor column & Condenser choking. Uneven addition rate	i) Continuous heating in the vapor column during reaction. ii) Uniform & freeze the Ethanol addition rate (8~9 Kg/hrs).	30-May-22	Done
Reactor temperature high	Improper chilled oil supply.	i) Study the distribution of chilled oil supply of plant & reroute chilled oil circulation. ii) Maintain the pressure(1.2~1.5 kg).	30-May-22	Done
Quality parameters not met.	Frequent choking & inconsistent ethanol feed rate.	i) Start cooking after ethanol for 30 min to reaction completion.	30-May-22	Done



**Role & Responsibility for Sustainance:**

Control

Activity	Responsibility	Frequency	Remarks
Planning & prior check the availability of Legal inspector.	Harivardhan(EHS)/ Chetan suthar	Regular	Raise the alert whenever required
Monitoring of quality parameter	Jitendra Patel (QC)	Regular	Raise the alert whenever required
Include the Cooking step in batch card & revised & printed batch card availability	Jignesh bhavsar	Regular	Raise the alert whenever required
Ensure the availability of READY Tote in system.	Nimesh Modi (AA) Dhramendra Mishra(LSM)	Regular	Raise the alert whenever required
Ensure & monitoring heating in vapor column & ethanol feeding rate.	Ashok Patel/ Tushar Bhramabhatt	Regular	Raise the alert whenever required
Monitor the batch cycle time	Amit Patel/ Pinkesh Patel	Regular	Raise the alert whenever required

**CONCLUSION :**

In conclusion, to improve the productivity of the DEALOx process, the DMAIC methodology has been used with a focus on the existing processes. The Define phase helped to identify the problem and set the objective to achieve consistent productivity by 10 Mt/month to meet the increased customer demand. The Measure and Analyze phase helped to understand the current process condition, and the causes of inconsistency were identified through tools like the cause and effect diagram. The Improve phase focused on developing action plans to address the identified causes, such as optimizing TOTE handover procedures and uniform and freezing the ethanol addition rate. Finally, the Control phase helps to ensure that the improvements are sustained and the desired productivity is achieved. Through the use of the DMAIC methodology, the productivity of the DEALOx process can be improved to meet the increased customer demand.

**References :**

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