

LEAN METRICS CHEAT SHEET



PROCESS

CYCLE TIME

Total production time to produce one unit
 $Process\ End\ Time - Process\ Start\ Time$

ON TIME DELIVERY

% of products delivered to customers on time
 $Units\ Delivered\ On\ Time / Total\ Units\ Delivered$

PROCESS DOWNTIME

Total time a process spends offline with no production

THROUGHPUT

Total units produced over a period of time, $Units\ Produced / Time$

TAKT TIME

Required Production Speed required to meet Customer Demand
 $Takt\ Time = Available\ Production\ Time / Customer\ Demand\ Rate$

LEAD TIME

Total time from order to delivery
 $Lead\ Time = Delivery\ Date - Order\ Date$

EFFICIENCY

OEE

Overall Equipment Effectiveness
 $OEE = Availability\ x\ Performance\ x\ Quality$

PROCESS EFFICIENCY

The ratio of value added activities in a process
 $Process\ Efficiency = Value\ Added\ Time / Lead\ Time$

CAPACITY UTILIZATION

How much of the total production capacity is being utilized

PRODUCTIVITY

SETUP TIME

Total time to switch products being made
 $Setup\ Time = Time\ of\ First\ Quality\ Unit\ Product\ B - Time\ of\ Last\ Quality\ Unit\ Product\ A$

WHAT'S POSSIBLE WITH LEAN



Lower Operating Costs



Reduced Waste



Increased Flexibility



Improved Quality



Shorter Process Changeovers



Improved Customer Satisfaction



Shorter Lead Times



Enhanced Productivity



Decreased Inventory Levels



Empowered Employees

DMAIC PROCESS



DEFINE



MEASURE



ANALYZE



IMPROVE

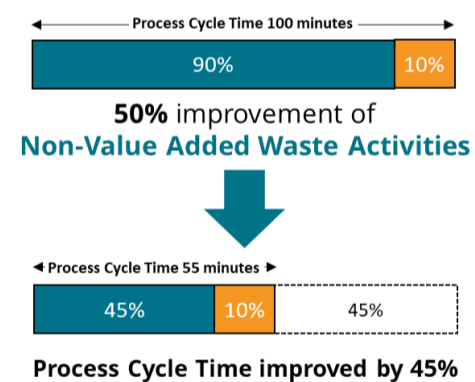
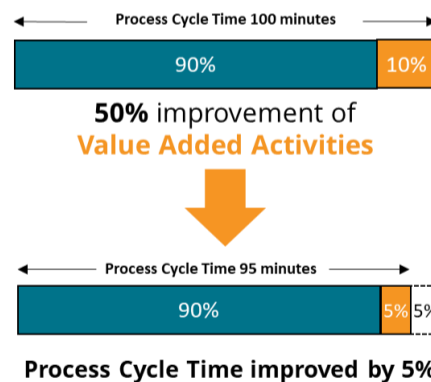


CONTROL

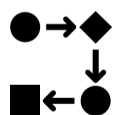
8 WASTES

- D** Defects
- O** Overproduction
- W** Waiting
- N** Non-Utilized Talent
- T** Transportation
- I** Inventory
- M** Motion
- E** Excess Processing

VALUE ANALYSIS



PROCESS IMPROVEMENT TOOLS



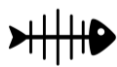
Process Mapping

Map the process step by step to identify improvement opportunities



Time & Motion Studies

Capture process movements, optimize layout and work activities for flow



Root Cause Analysis

Identify the source of process problems and design effective solutions



Kanban Systems

Deliver exactly what the process needs, exactly when the process needs it



Standard Work

Develop work standards to achieve consistent execution



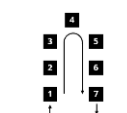
5S Workplace Organization

A place for everything and everything in its' place



Value Stream Mapping

Streamline value generation in the production process



Cell Design

Design efficient work cells to facilitate optimal process flow



Lean Material Flow

Create pull systems to ensure optimal material flow in the process



Voice of the Customer

Capture Customer requirements and design the process to align with them

FINANCE

COST PER UNIT

Total cost to produce a single unit of product
 $Total\ Manufacturing\ Cost / Total\ Units\ Produced$

ENERGY PER UNIT

Energy used to produce a single unit of product
 $Total\ Energy\ Used / Total\ Units\ Produced$

OVERTIME RATE

Ratio of Overtime hours
 $Overtime\ Rate = Overtime\ Hours / Total\ Hours\ x\ 100$

INVENTORY

INVENTORY TURNS

Inventory usage and replacement rate
 $Inventory\ Turns = COGS / Average\ Inventory\ Value\ over\ a\ period\ of\ time$

WIP INVENTORY COST

The value of Work In Progress (WIP) units in the production process

QUALITY

FIRST PASS YIELD

The amount of product produced that meets quality standards
 $FPY = Quality\ Units / Total\ Units\ Produced$

DEFECT RATE

The number of defects incurred over a period of time

SUPPLIER QUALITY

% of defects identified in raw materials

SCRAP RATE

Amount of scrap product generated over a period of time

REWORK RATE

% of units produced that need to be reworked due to quality issues

COST OF QUALITY

Total cost of quality including prevention, appraisal, internal and external failure costs