


LEAN CHEAT SHEET – Key Concepts


Purpose of Lean



Deliver **Value** to **Customer**



Removing all **wastes**



Through empowered **workforce**

Keywords

Customer	The recipient of the product or service you produce.
Value Added	Any activity that transforms the product or service that the customer is willing to pay for.
Waste	Activity that consumes resources without adding value (Muda).
Flow	Sequence of phases creating value. Every interruption is a waste.
Engaged	Lean is about development, self-reliance and skill building.

The goal is to improve






Safety & Ergo


Quality

Productivity

Cost

Lead Time





imagination at work

Understanding Value

VA

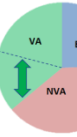
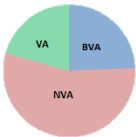
Value added

NVA

Non Value added (Waste)

BVA


NVA but necessary



Before

After

Mapping the Value Stream



Value Stream Mapping

Value Stream
End-to-end business process which delivers a product or service to a customer.

Muda - 7 wastes – TIM WOOD

Transportation	Non-value added transport of materials or work.
Inventory	Extra finished goods, work-in-process or supplies.
Motion	Any unnecessary movement within a work process.
Waiting	Time spent waiting rather than working.
Over Production	Producing anything earlier or in greater quantities than needed.
Over Processing	Processing beyond what the customer truly needs.
Defects	Time, effort and materials used to repair defects.

Muri & Mura

Muri	Overburden on people and equipment.
Mura	Unevenness in production.

Long-Term Vision



Goals that reinforce improvement not hard targets


→

Steady, sustained approach using standardized processes


→

Results


Lean culture




Teamwork and Respect




Reveal Problems




Learn by Doing, Go and See at the Gemba




Profit based on cost reduction




Regard for Next Process



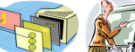
Learn from experience (Reflection)




Price - Cost = Profit




Visual understanding of Conditions




Standardize and Share Successful Practices



Elimination of Waste





MUDA



Visual management

Visual Management

- Makes problems visible and immediate
- Communicates current conditions.
- Triggers correct response or action.
- Seeing is knowing.



Want to communicate a standard on a chart?
Draw a horizontal target line.
Are you above or below?

LEAN CHEAT SHEET - Tools

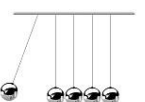
Just in Time



- ✓ Reduces **Muda**.
- ✓ Simplifies processes and promotes **up-time**.
- ✓ Makes the most of limited space and resources.



- Continuous Flow**
- Make one, Move one.
 - Single piece flow.



- Takt Time vs. Cycle Time**
- Takt time is setting the pace of production to customer demand
 - Cycle time is the time required to complete 1 operation.



- Pull System**
- Controlling the flow by replacing only what has been consumed.



- Supermarkets and Kanban**
- Supermarkets reduce inventory by storing and replenishing at the pace of production. The replenishment signal is a Kanban.

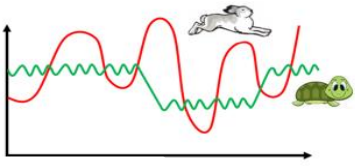


- **JIT** is an evolution that takes a lot of commitment from everyone. As you progress challenges will arise. See these problems as opportunities and work through them.

Leveling & Sequencing (Heijunka)



- ✓ Reduces **Mura**, **Muri** and **Muda**.
- ✓ Enabler to create a **stable FLOW**.
- ✓ Reduces **changeover**; increases **flexibility**.



- Reducing variation in Product and Process will lead to **higher quality**.
- Higher quality leads to **higher efficiency**.
- Higher efficiency leads to **lower costs**.

House of Lean



GE Operating System

Standardizing Processes



- ✓ Stabilizes and removes **uncertainty**.
- ✓ It's the baseline for **continuous improvement**.
- ✓ Reduces **Muda**.

- 5S (Sort, Set order, Shine, Standardize, Sustain)**
- Workplace Organization
 - A clean, organized workplace is a respected and efficient workplace.



- Standardized work**
- Eliminates waste by consistently applying best practices. Forms a baseline for future improvement activities.



- 3 Key steps for Std Work**
- **Takt Time**: Available time / number of unit sold.
 - **Work Sequence**: Operator work sequence from beginning to end.
 - **Std WIP (SWIP)**: Refers to the minimum work-in-process needed to perform repetitive operations.



- **Most powerful** but least used Lean tool.
- Should not be restrictive or limiting.
- Should be done by the people who do the work.

Jidoka



- ✓ Detects **problems** and **abnormal conditions** and stop the process if any.
- ✓ Reduces **Muda** preventing defects.
- ✓ Increases **quality** of final product.



- Andon (Visual control in production line)**
- Line stopped in order to rectify something.
 - Worker calls for help.
 - Everything is fine.



- Error Proofing (Poka-Yoke)**
- Mechanism that helps avoiding mistakes and preventing defects.



- Autonomation**
- Automation with a human touch.
 - Building intelligent controls into machinery or processes that can detect defects, stop and alert people.



- Total Productive Maintenance**
- Machine operator trained to do day-to-day maintenance.
 - Understand the machinery and identify problems before they impact production.
- **Jidoka** is an enabler for problem solving. It stops the process before the "trail goes cold" to allow effective root cause analysis.



Kaizen



- ✓ Engages organizational **participation**
- ✓ Reduces **Muda**.
- ✓ Creates quick, sustained **results**



- PDCA- Plan Do Check Act**
- Iterative four-step management method for the control of processes and products.



- **Kaizen** is continuous improvement through small Steps.
- Do it better, make it better.

