Lean Tools




**Hoshin Kanri (Policy Deployment)**

- It is a method ensuring that strategic goals of company drive progress and action at every level
- Eliminates the waste of
    - Inconsistent direction
    - Poor Communication
- Strives to align every employee in same direction at same time

Implementing Hosin Kanri

1. Create a Strategic Plan
    - Focus on only few big issues
    - Effectiveness first
    - Top Down consensus
    - Careful choice of KPI
    - Each Goal with Goal Owner, Facilitator, Coach
2. Develop Tactics

    Tactics are developed such that they can best achieve the goals laid by Top management

    **Catch ball technique** – Back and forth movement of strategy and goals so that they are well understood, shared and help in creating meaningful KPI.

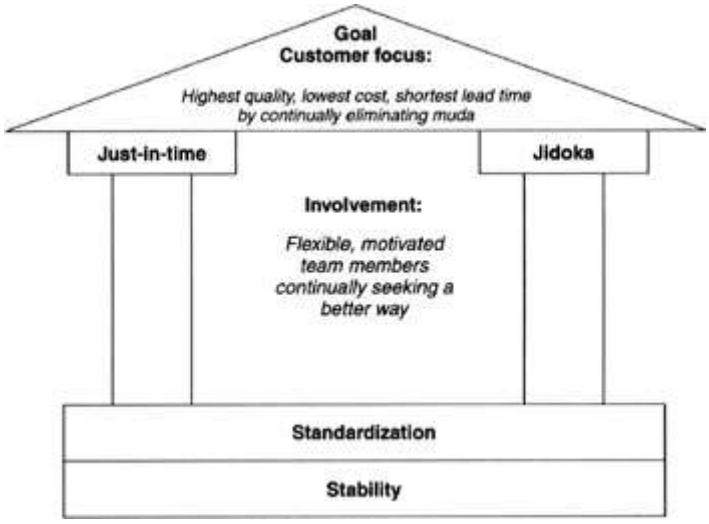
| Conventional | Toyota/Lean |
|---|---|
| Move the metal! Make your numbers! | Stop production—so that production never has to stop! (Jidoka concept) |
| Make as much as you can. Go as fast as you can. (Push system) | Make only what the customer has ordered. (Pull system) |
| Make big batches and move them slowly through the system. (Batch and queue) | Make things one at a time and move them quickly through the system. (Flow) |
| Thou shalt! (Leader = Boss) | What do you think? (Leader = Teacher) |
| We have some standards. (Not sure where they are or of they're followed…) | We have simple, visual standards for all important things. |
| Engineers and other specialists create standards. The rest of us do what we're told. | The people closest to the work develop standards and pull in specialists as required. |
| Don't get caught holding the bag! | Make problems visible. |
| Only grunts go to the shop floor. | Go and see for yourself. |
| Do-Do-Do-Do! | Plan-Do-Check-Adjust (PDCA) |



## Basic Image of Lean Production

However, the lean system has proven difficult to grasp as a whole. The tendency has been to **cherry pick** activities—a smattering of 5S, a kaizen blitz, some TPM, which has failed to produce the desired results. Such implementation efforts, at their worst, seem a Frankenstein—a project made up of various ill-fitting parts, stitched together in the hope that something will bring it to life. **At Toyota, by contrast, I found that our efforts proceeded organically, guided by the question: *What is the need?***
We have to follow the Customer focus and align everything else to it.

As your understanding deepens, you will perceive layers of meaning and come to understand the importance of a humble spirit.




- Each Activity is interconnected and continual reinforcement of core concepts is power of Toyota system.

**we should organize our maintenance activities around the life cycle of the equipment, which typically follows the so-called bathtub curve shown in Figure 3.3.**

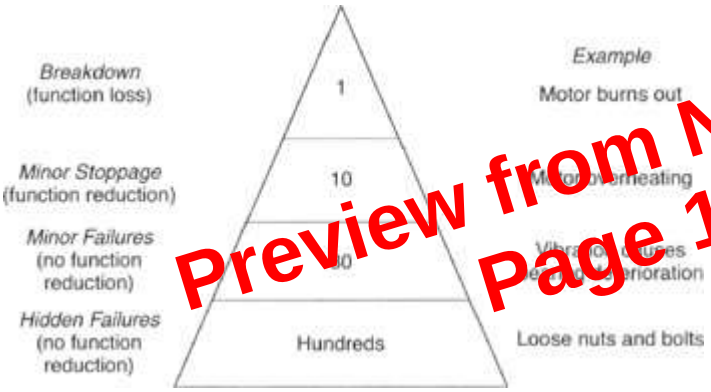

| Category | Start-up Failures | Chance Failures | Wear-out Failures |
|---|---|---|---|
| Cause | Design and manufacturing errors | Operational errors; minor and hidden failures | Wear-out |
| Counter-measures | Trial runs; equipment commissioning process | Check and track minor and hidden failures; make countermeasures | Prevention; improve maintainability |

Figure 3.3: Lifespan Characteristics and Maintenance Activities

Daily Need and Monitoring Done by – Production Worker

Routine Checkup and Issue Resolution done by – Maintenance worker

## The Machine Loss Pyramid






- Breakdown means function loss.
- Minor stoppage means function reduction.
- Minor failure means a substandard condition or incident that does cause function loss (e.g., elevated temperature or pressure, vibration, scratches, dust, and chip emissions).
- Hidden failure means a condition that may lead to a minor failure (e.g., loose nuts and bolts, lubricant breakdown, warping, or stretching).

TPM means Listening and watching for anomalies and taking action before breakdown.

Prevent Breakdown & Improve understanding of our equipment.

Group Activity: Promote Small problem Reporting

Helps in :

1. OEE and Life of Machine Improvement. 2. Increase Capability of Machine. 3. Increase respect for our Team.

Most managers imagine that goods and services move through the system and that good management comprises minimizing variations in the performance of the complex system. But the real need is to get rid of the system and start over, on the basis of value.

**Relation of Flow and Muda** : Muda is usually a symptom of obstacles to flow.

## The Magic of Pull

Pull systems control WIP, put an **upper limit on WIP in the system**

And this in turn:

- reduces cycle time—in accord with Little's law
- reduces operating expense—we aren't ordering as much raw material or making as much WIP and finished goods inventory
- improves quality—defects are not reproduced in large batches, and are easier to catch quickly
- improves ergonomics—part bins aren't as big or numerous so there is less heavy lifting,
- improves safety—there are fewer forklift trucks whizzing by

## *The JIT System*

**JIT Depends on –> Kanban and Production levelling (Heijunka) –>SMED, Visual Management, Capable process (Men, M/C, Method).**

*JIT – Knowing What is asked by customer by Kanban and only providing What is asked not excess by Production leveling as it Removes Bottle necks, Stable process and less change over time Reduce requirement of Excess Inventory .*



**Kanban – Authorization to Produce / withdraw**

There are two kinds of kanban:

- **Production kanban**, which specifies the kind and quantity of product that the upstream process (supplier) must produce.
- **Withdrawal kanban**, which specifies the kind and quantity of product that the downstream process (customer) may withdraw.

### Kanban Metaphors

The gear metaphor is especially powerful. Mechanical gears synchronize the movement of disparate parts with that of the central motive force. Similarly, kanbans synchronize disparate production processes with the "pacemaker." Only thus can the customer pull through the **pacemaker process**.

Toyota have production plan which is annual, monthly for capacity, person, and parts required.

The various forecast are refined to 10 days order → Daily production plan which is **+/- 10% is fine-tuned by Kanban.**

### Pacemaker Process

The pacemaker is the point of connection with the customer, the process at which production is scheduled.

In kanban process – only one production schedule is used and provide visibility of production on other hand ERP System requires Schedule and reschedule each point in production process.

**Focus & Alignment through Hoshin Planning**

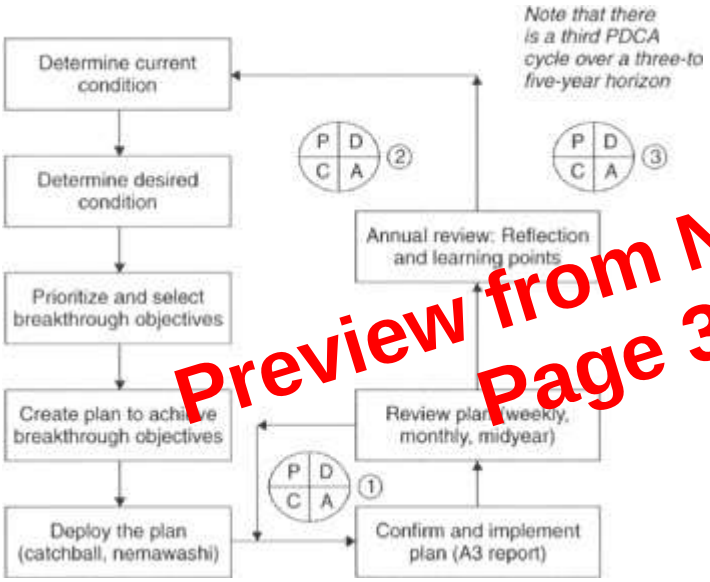
Through hoshin planning we seek to:

- identify **our critical few improvement initiatives each year**,
- **develop corresponding strategies (A3′s),**
- **deploy our A3 strategies throughout the organization**, and
- **Involve all team members** in problem solving.

Lean Implementation Fail because we focus on too many things.

## *Hoshin Planning System*

- **Plan-do-check-act.**
- ***Nemawashi.***
- **Catchball.**
- **Control department concept.**
- **A3 thinking**






**PDCA:**

Comprises overlapping PDCA cycles at levels of Organization

*PDCA at 3 levels of Planning*

- *Macro (three to five years).* Practiced by senior management.
- *Annual.* Practiced by operating managers.
- *Micro (weekly, monthly, and biannual):* Practiced by operating managers and their subordinates

Reviews are important – Mid Term and Annual Reviews

Reports should be:

Clear Status Report

- Execute the plan.
- Be affected by the plan.
- Approve the plan.
- Be able to improve the plan.

Nemawashi involves **numerous revisions** based on customer feedback. But there will be **no unpleasant surprises** when you present your plan to senior management.

A caveat: Consensus building does not mean that I must give up my ideas or beliefs. **Nor does it mean that we must all agree before a hoshin is implemented**. At times **we may agree to disagree**. But **consensus does mean that I will support the decision of the group.**

**We agree to disagree but Support the group's Decision as we are involved in Decision making and we have raised our flags of Concerns and convinced that group decision is for collective Good.**

## Catch ball – Linking Vision to Daily Activity of Shop floor – Alignment of Organization.

*Catch ball* refers to the give and take required between and among management levels during the planning process.

The catch ball seeks to link the vision of the officers and the daily activities of shop floor team members.

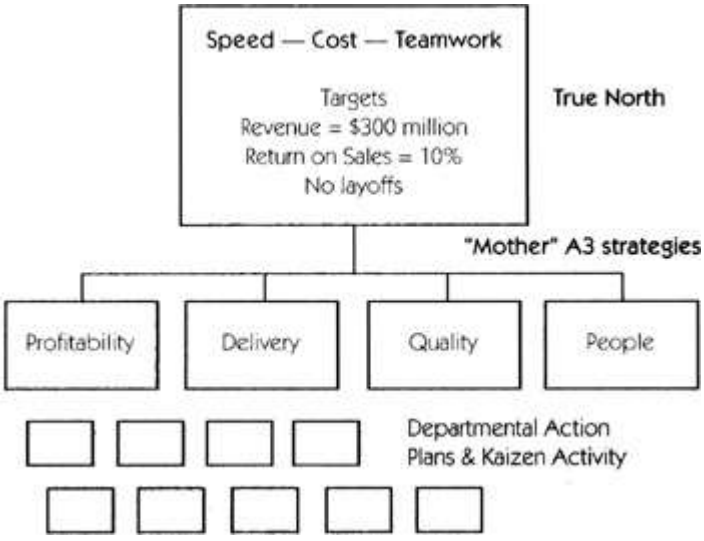
**All levels of organization discuss and agree on Goals as well Means.**

Vision → ← Hoshin Planning → ← Activities
Officer → ← Sr.Management → ← Middle Management

**The Planning and Execution Tree:**

The important thing is to think it through and chart your own course.






## The Control Department Concept

Control Department for Focus will co-ordinate cross functional activities. Help planning, Activity setting in their Area.

Develop Affinity and Tree Diagram with only 5 branches, a common mistake is to take on too much. Pick a few boulders each year.

## Hoshin Implementation

PDCA + Periodic Reviews

## Hoshin Evaluation

Year End Assessment of process and outcome goals, If Achieved ask 5 Whys , If Not Achieved Ask 5 Whys

Thing gone Right and Things on Wrong.

**Book of Knowledge –** Record of Key goal areas – Activities and challenges – hallmark for learning organization

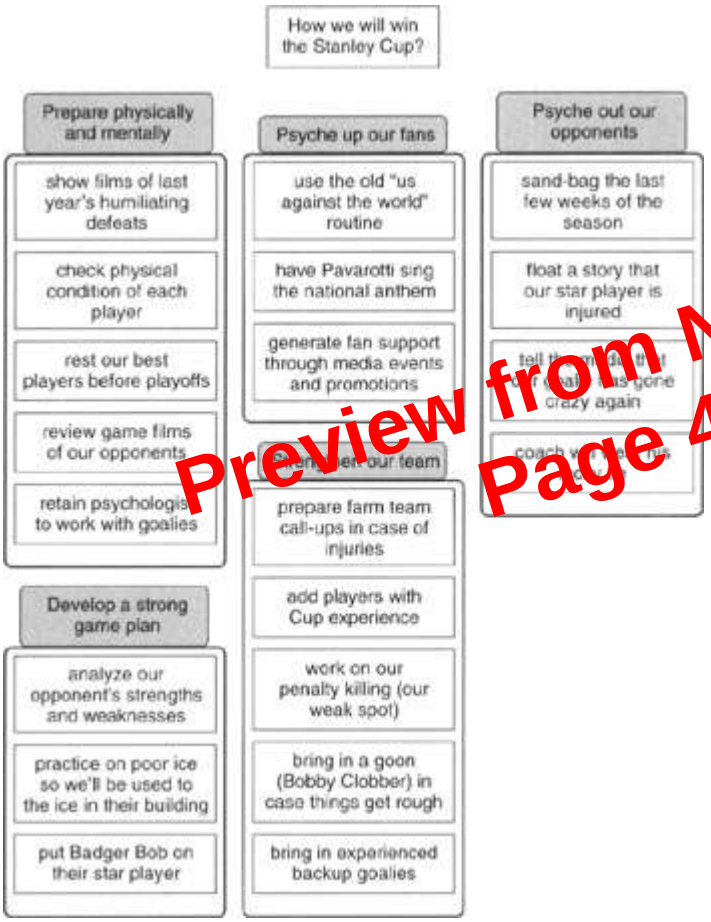





**Figure 8.9:** Affinity Diagram Sample

- Genchi genbutsu.

## Paradox

Toyota system to be full of paradox, and therefore endlessly engaging

- Jidoka. Stop production so that production never has to stop.
- Standards change all the time.
- One-at-a-time production is more effective than batch production.
- Maximizing unit efficiencies does not maximize overall efficiency.
- Don't make something unless a customer has ordered it.
- Team members, not industrial engineers, develop standardized work.
- Seek perfection, even though we know we will never achieve it.

**Therefore, I learned to approach the system with humility, recognizing that it may take a lifetime to grasp. It took a while to shed the "been there, done that" mentality that closes the door to profound knowledge and growth.**

## Intensity

PDCA, standardization, visual management, the endless quest for perfection, and so on, make for an intense culture.

Lean Reduces / Removes mud and Reduces work load

We use lean because we need to

Reduce work by Removing Muda

Don’t throw resource at work - we must identify the muda and make kaizen.

Temporary support may be required

we eliminate muda, work becomes easier.



## Lean Production as a Path

When a set of methods or techniques connects to a person's whole being, it becomes a *do* or path.

Lean is life long learning so , we must approach it with the proper spirit:

- *Humility.* We seek but know we will never achieve perfection.
- *Life-long learning.*
- *Respect for people.* Leaders must ask, "How can I strengthen my team members?"

## *How Does Lean Culture Feel?*

As I reflect on my Toyota experience, here are some words that come to mind:

- Disciplined.
- Freewheeling.
- Warm.
- Indomitable.