

LEAN SIX SIGMA

DEFINE PHASE

"There is no substitute for knowledge." - DR.William Edwards Deming

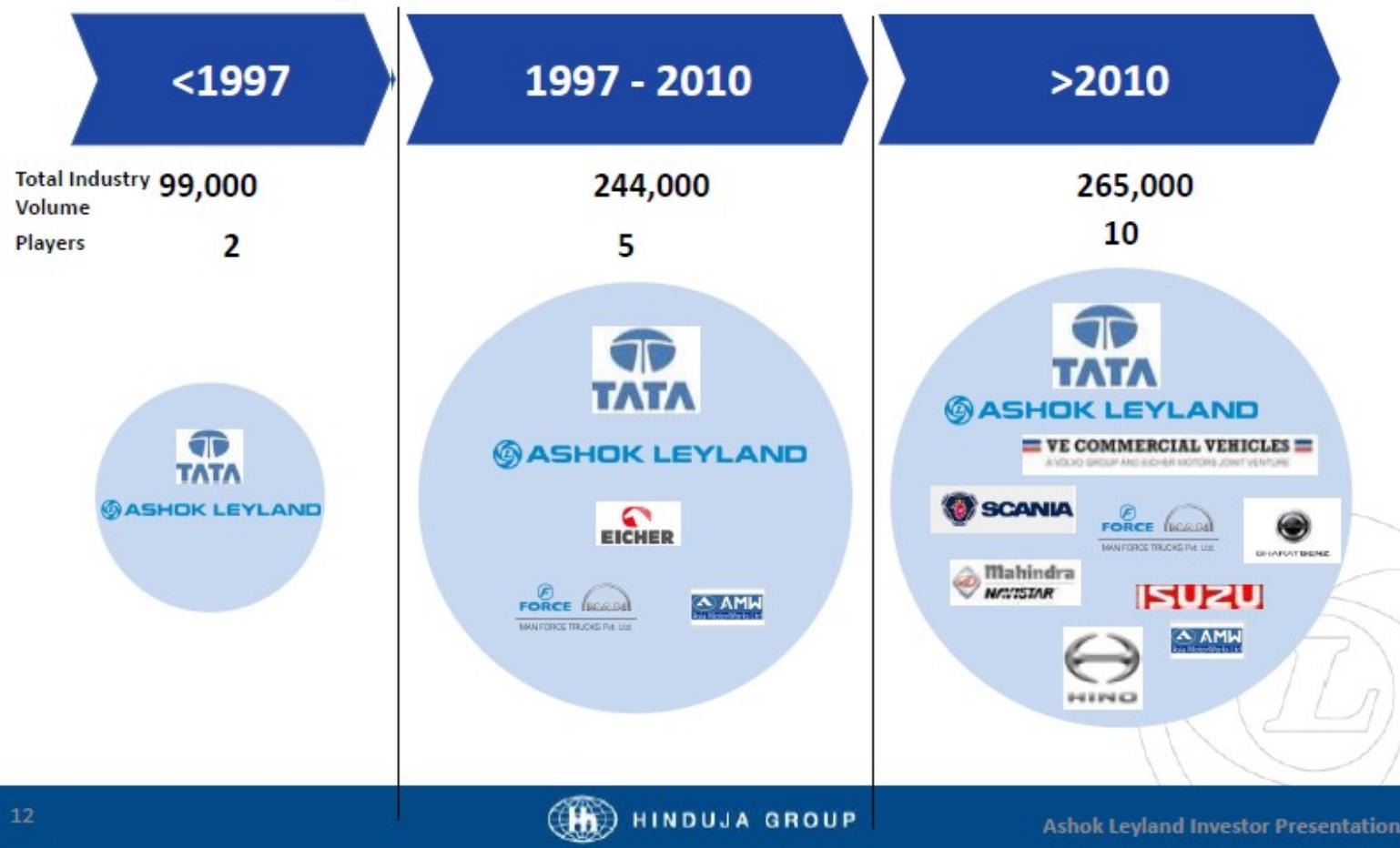


COURSE CONTENT

Coverage:

- **Introduction to QUALITY and LEAN SIX SIGMA**
 - History of Quality (Deming, Juran, Ishikawa, Taguchi, etc.)
 - Evolution of Six Sigma
 - Evolution of LEAN
 - Lean Six Sigma – philosophy and objectives
 - Deliverables of a Lean Six Sigma Project
 - Data driven decision making
 - The Problem Solving Strategy $Y = f(x)$
 - Understanding LSS frame work

Improvement is a Market Need



Which car is a quality car?

TATA NANO



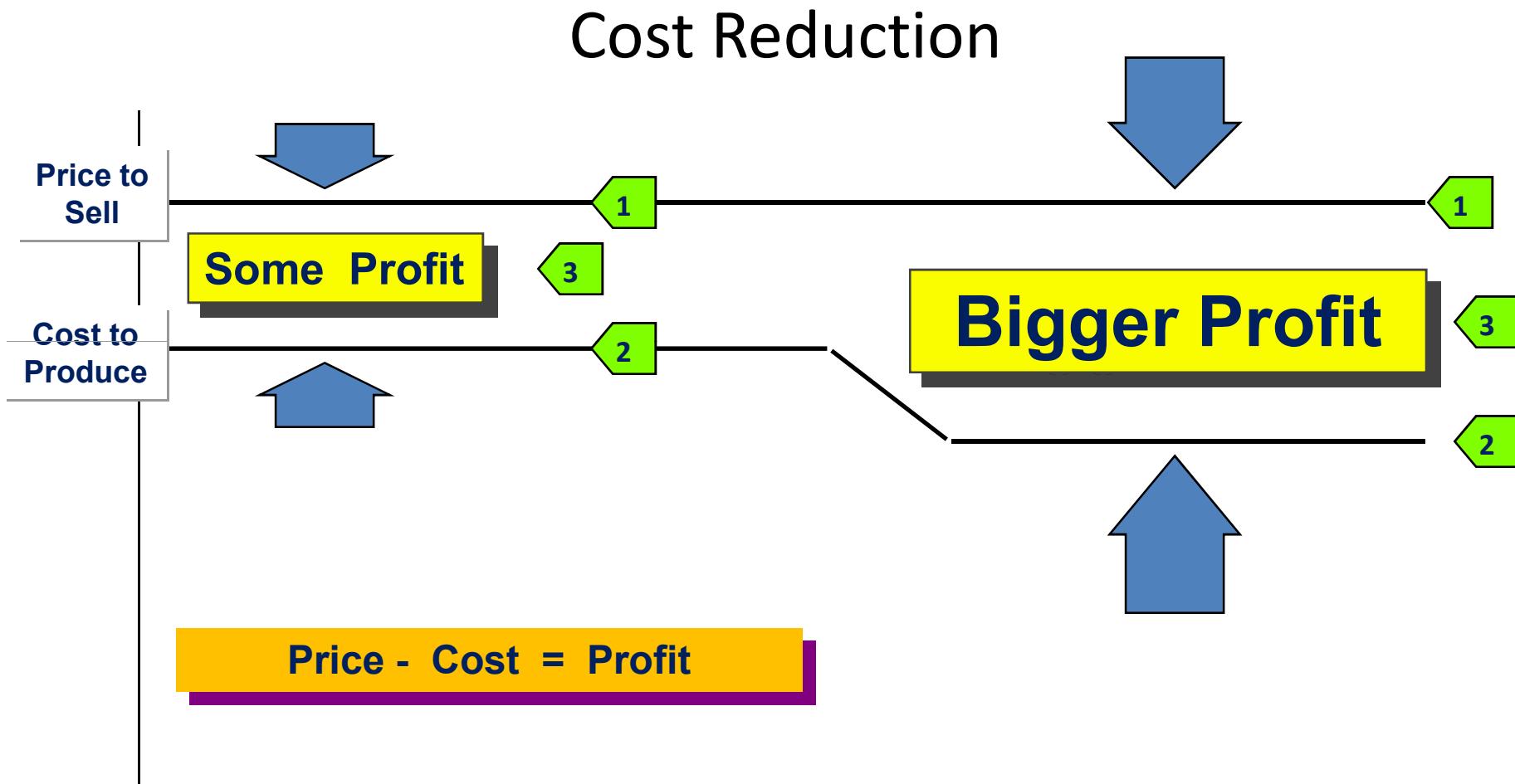
MERCEDES BENZ



What is Quality?

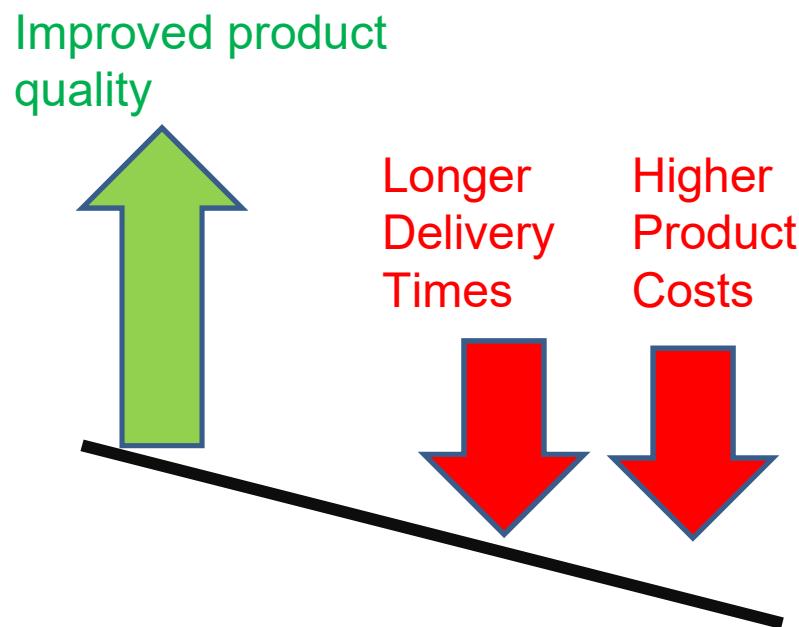
- Meeting customer need (Crosby)
- Fitness for purpose (Juran)
- Conformance to specification
- Characteristics and properties of a product, seen as a whole, as ability to fulfil specified or implied requirements of the customer

What is business impact of improving Quality

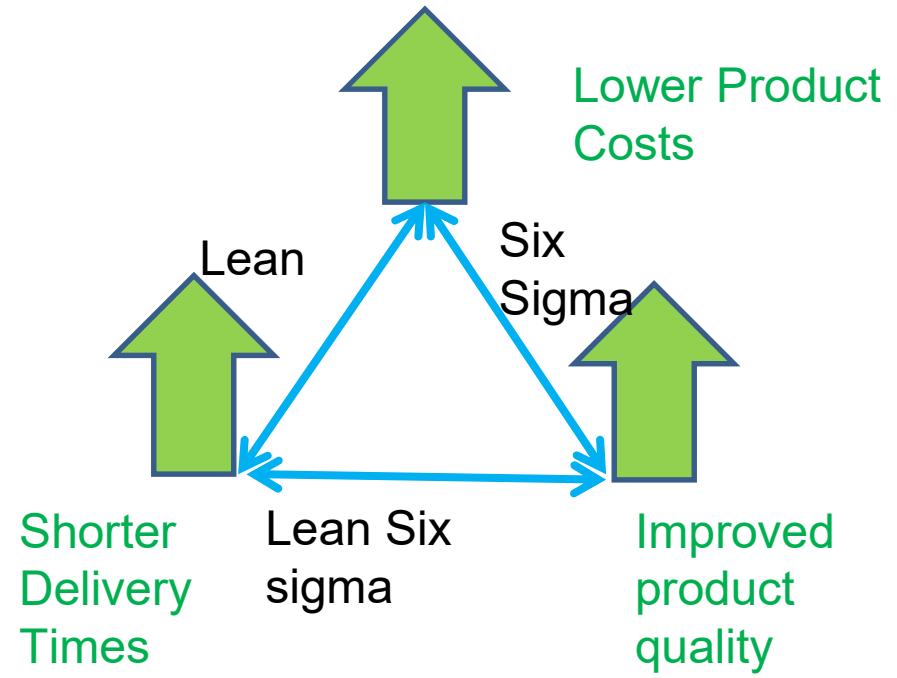


Buyer's Market Dynamics

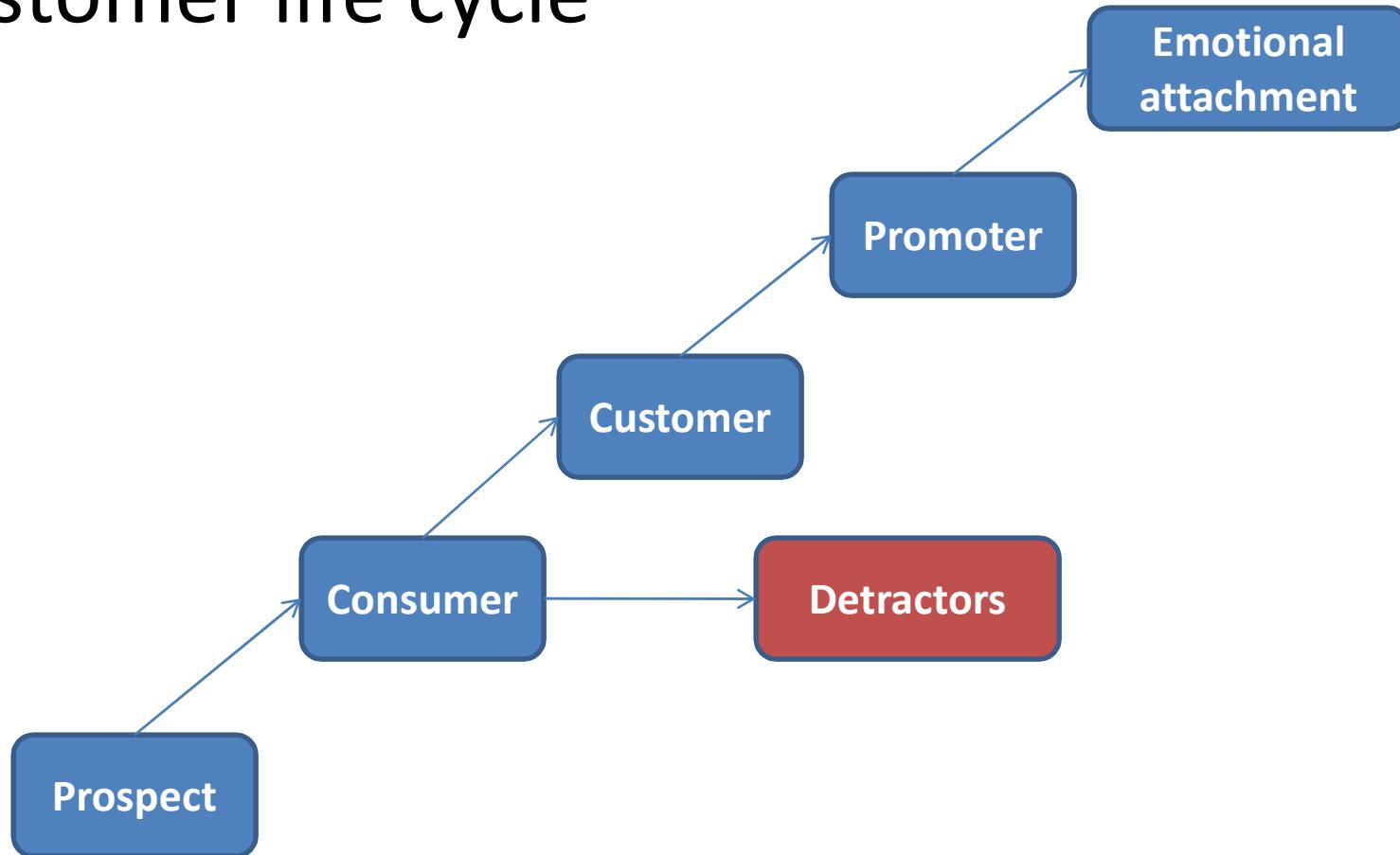
Traditional Strategy



Lean Six Sigma Strategy



Customer life cycle

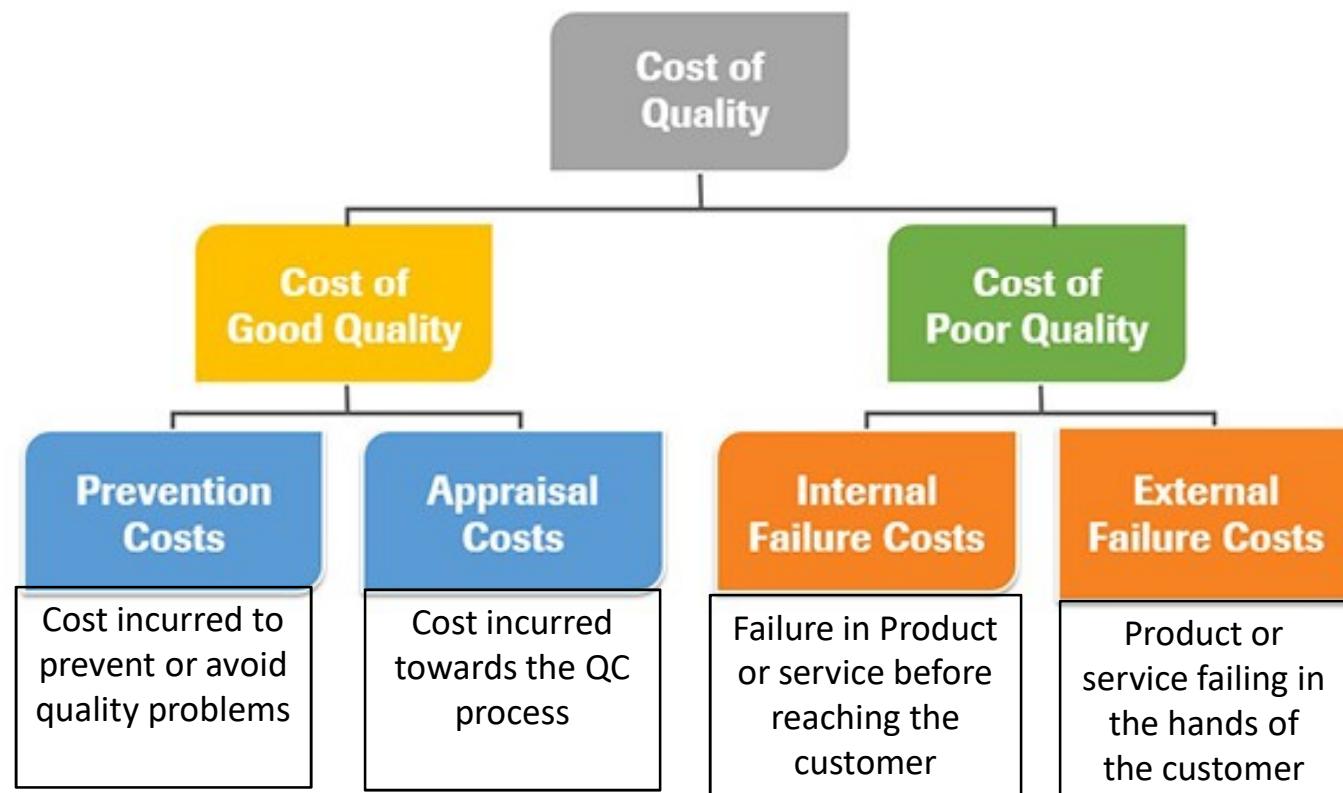


Quality Game: Inspect No. of “F”

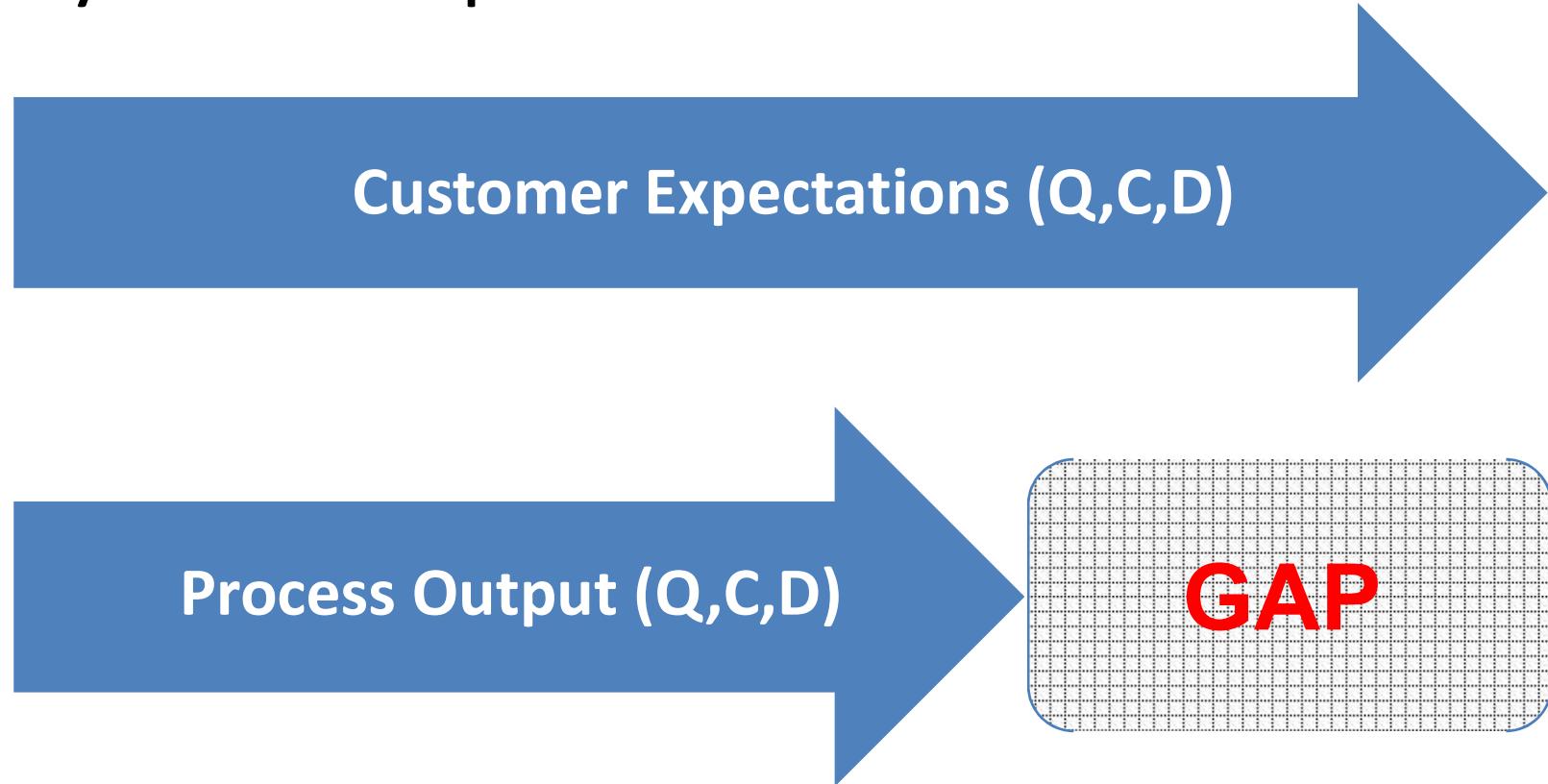
- FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITHTHE EXPERIENCE OF FIFTY YEARS
- FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITHTHE EXPERIENCE OF FIFTY YEARS
- “Inspection is at best 80% to 85% effective.” – Juran

Total Cost Of Quality

Cost of Quality Breakdown



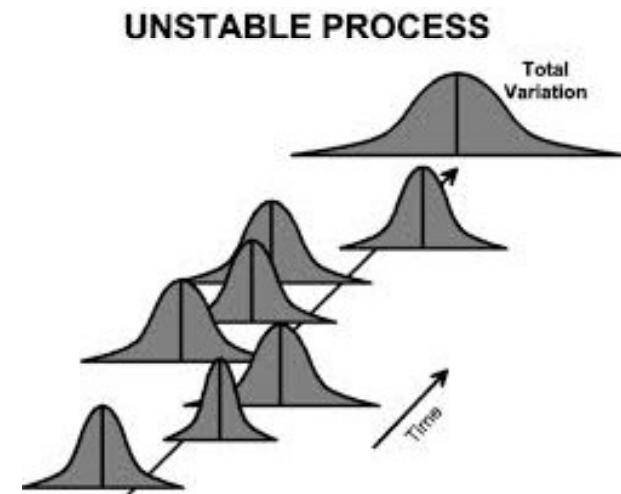
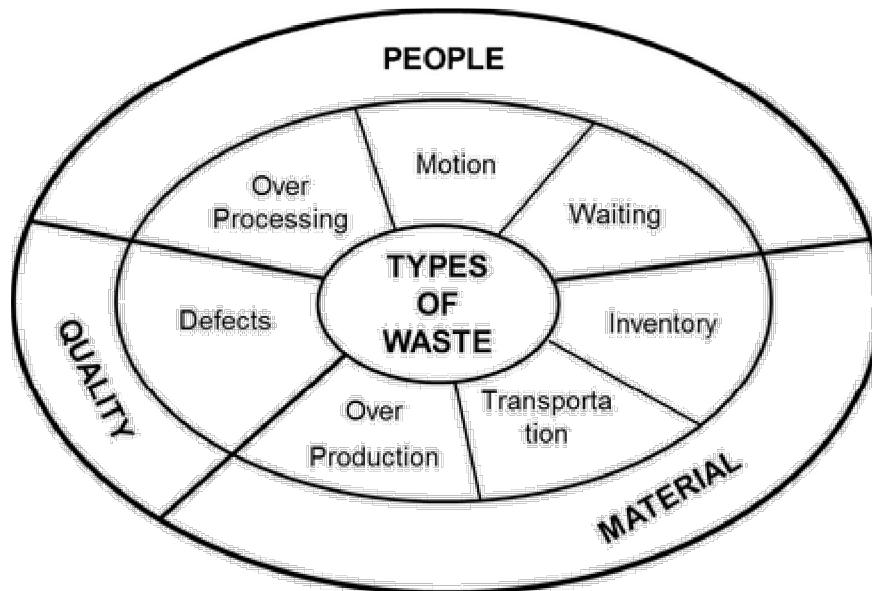
Why we have problem?



Why this Gap?

Waste

Variation



What is Lean Six Sigma?

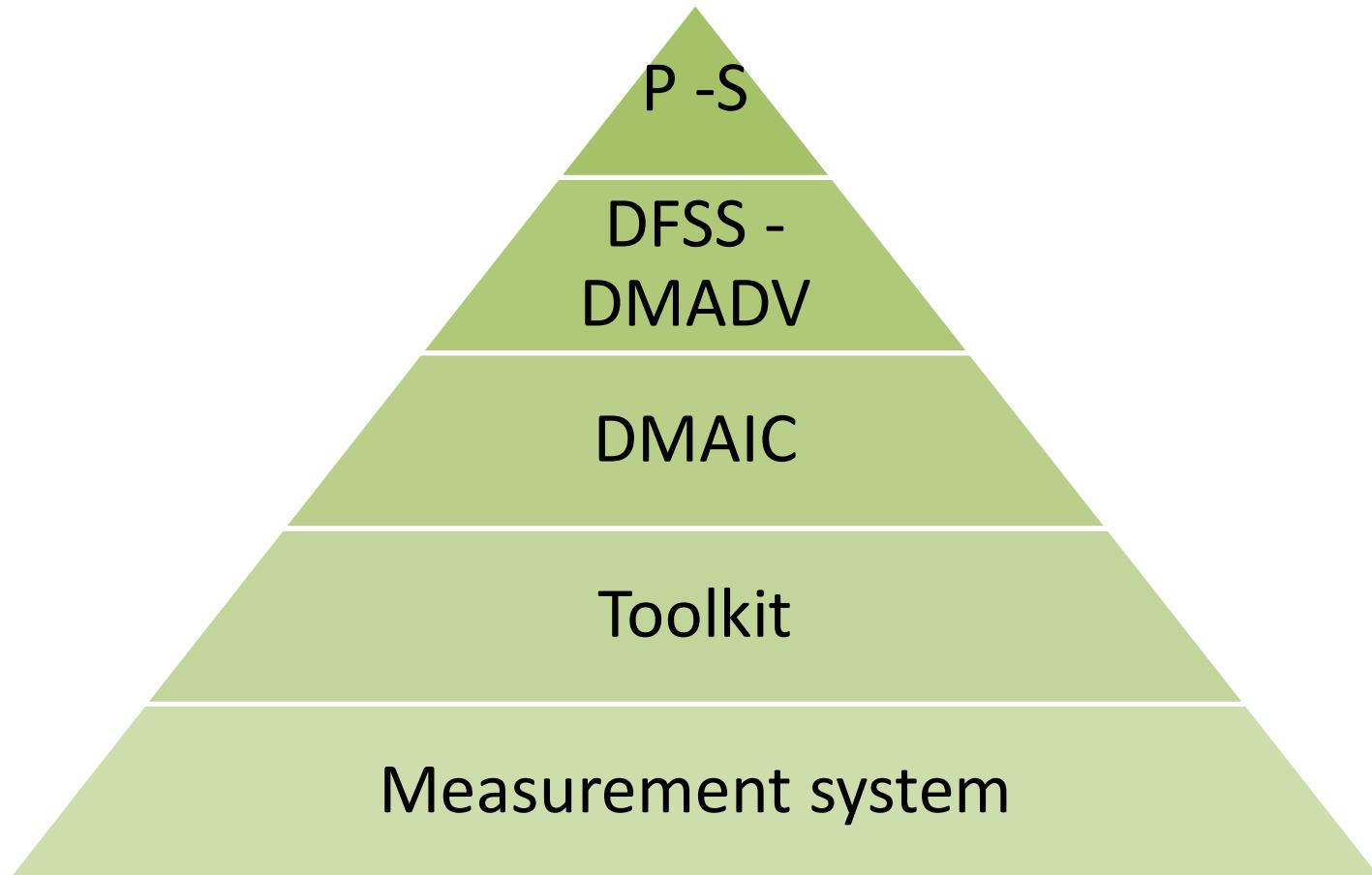
LEAN :

- Goal – Eliminate waste & increase process speed
- Method – Genchi Genbutsu– Go and See the workplace and Kaizen (Change for better) workshops

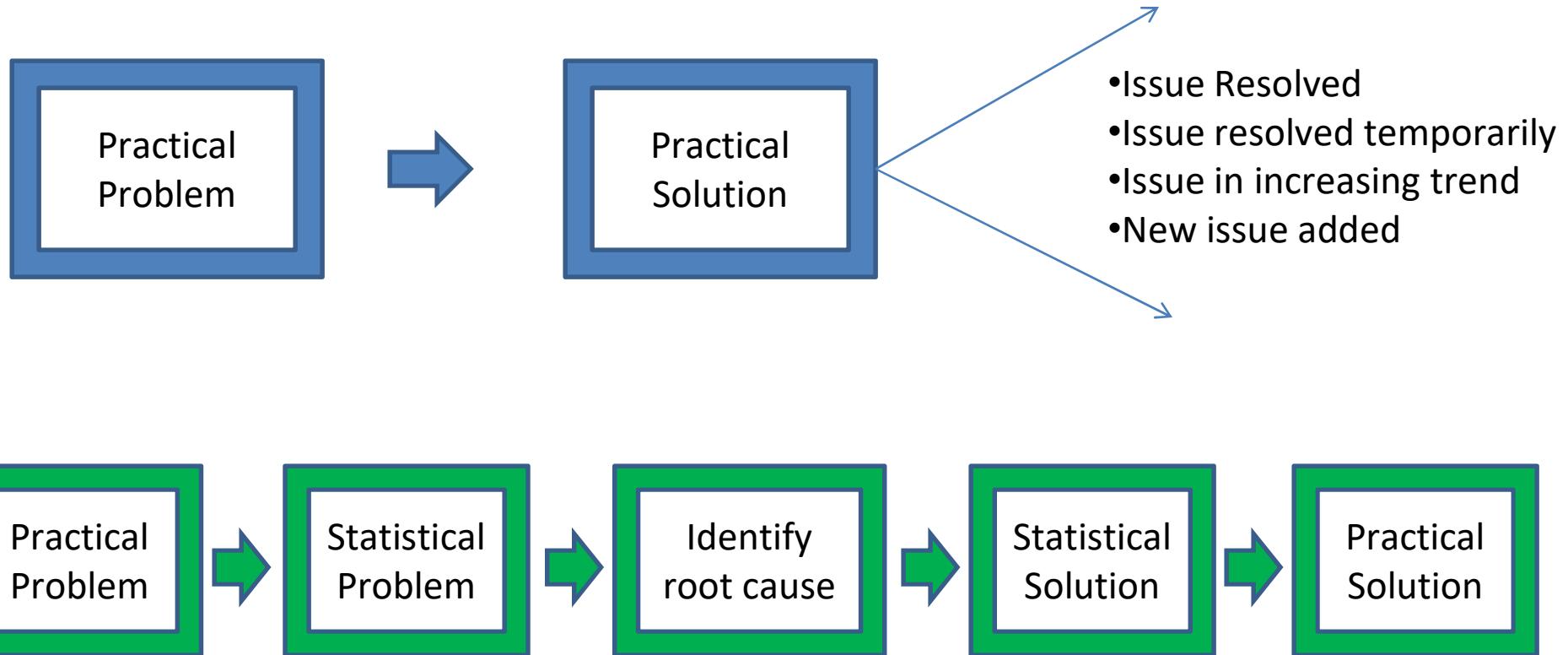
Six Sigma :

- Goal – Reduce variation to improve performance on CTQs
- Method – DMAIC approach, DFSS approach

What is SIX SIGMA



Traditional way of problem solving (vs) Six sigma way of problem solving



Lean Six Sigma Methodology

Sweet fruits

DFSS - DMADV

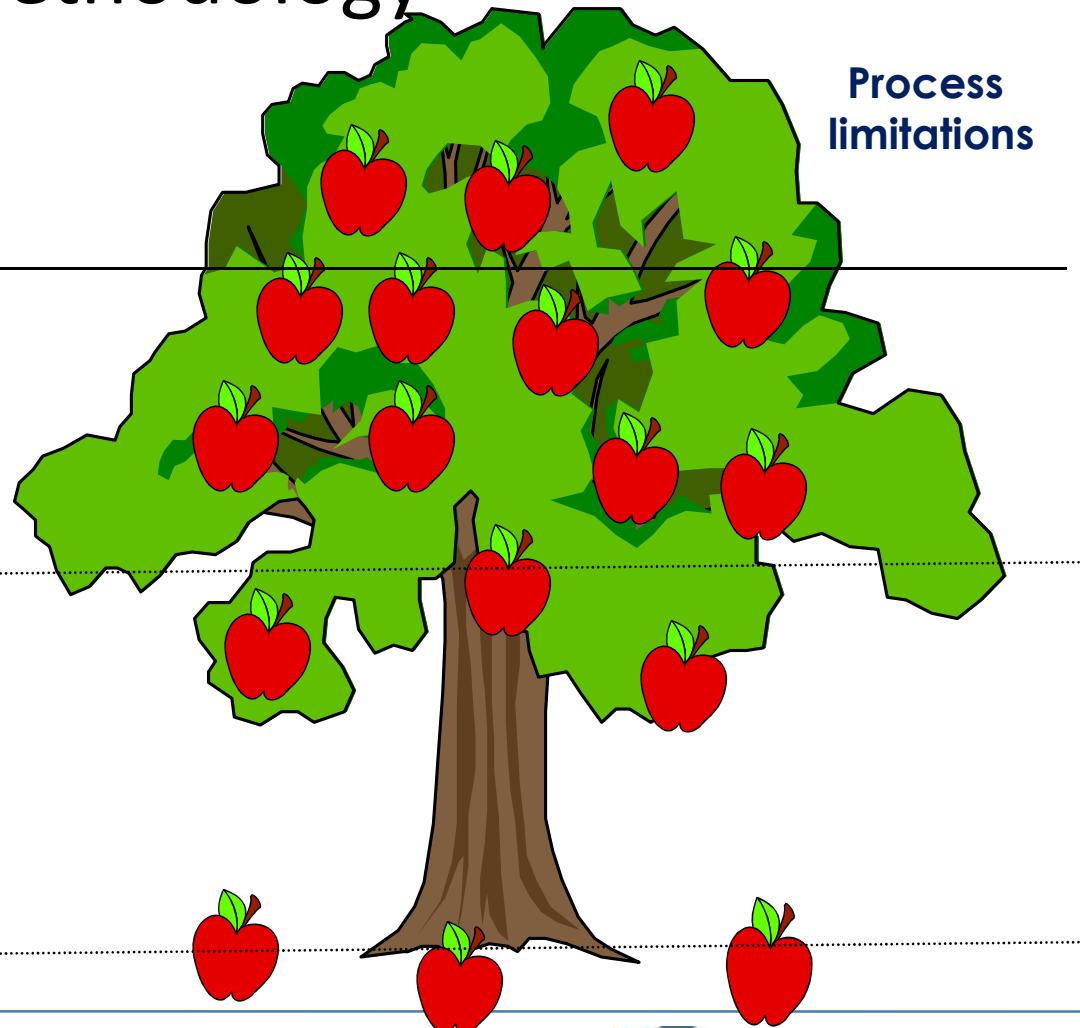
Bulk of fruits

Process characterization
and optimization

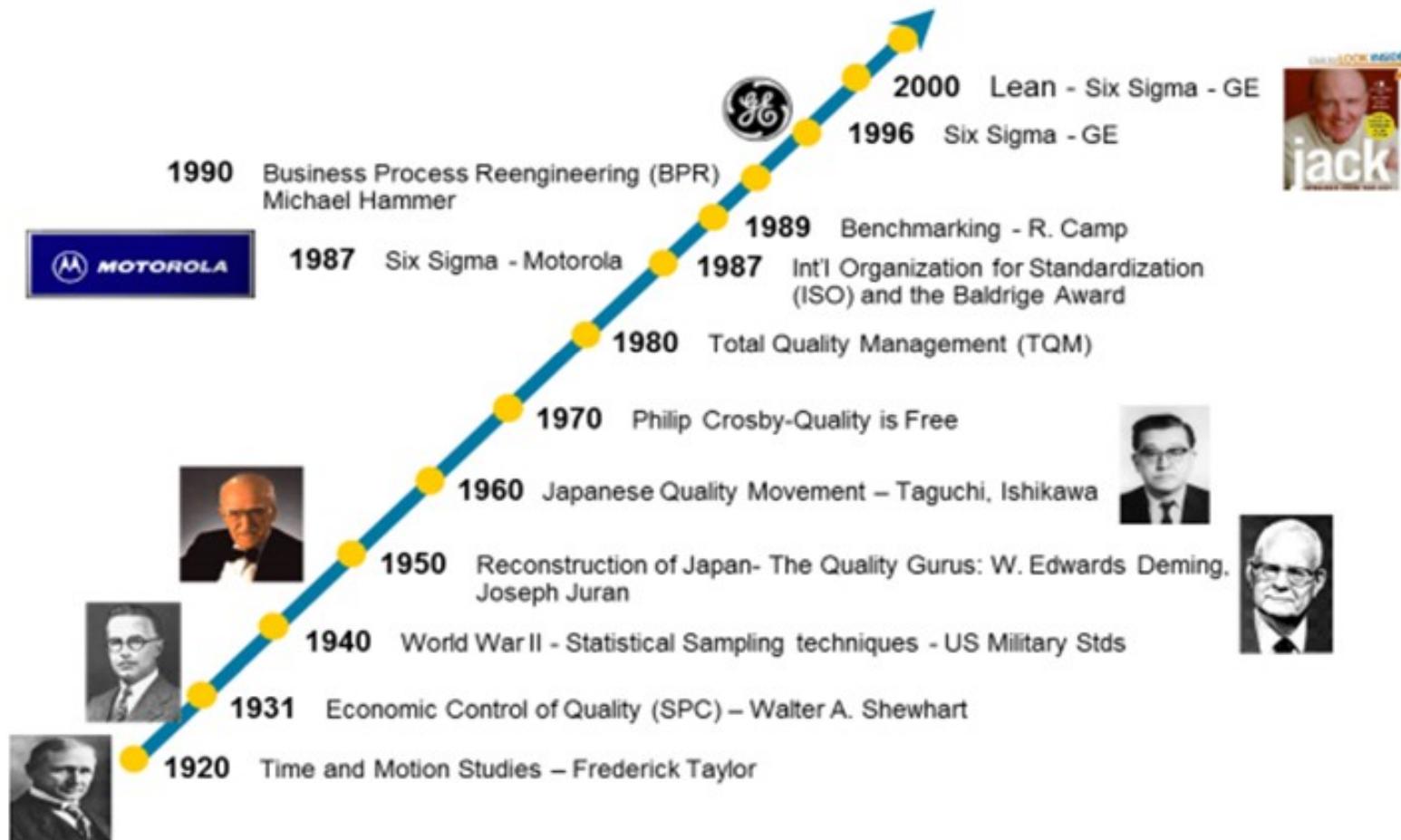
Low hanging fruits
Simple QC tools

Logic and intuition
Quick hits-Kaizen

Process
limitations



Evolution of Six Sigma

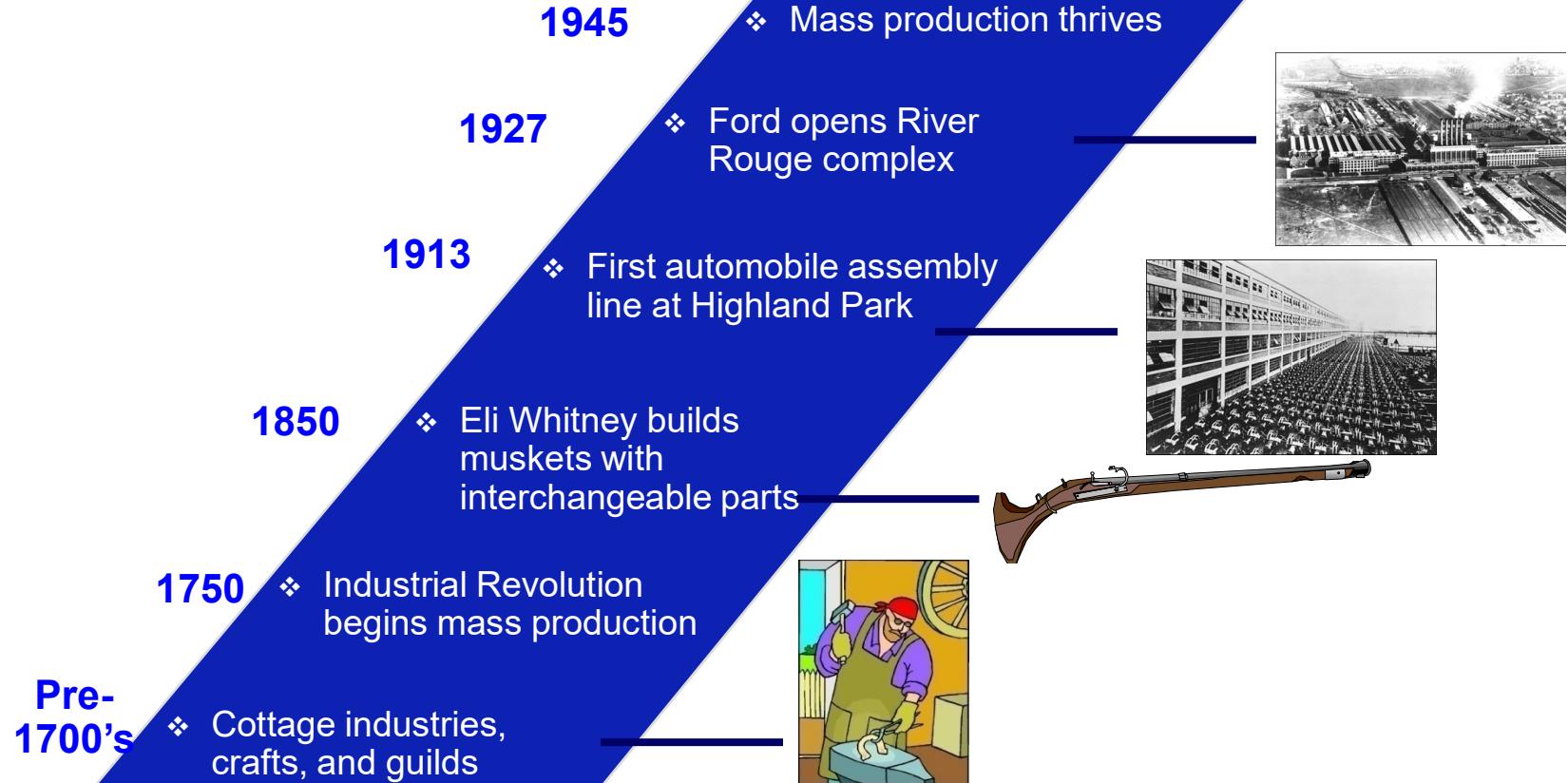


Lean _ Process Driven Approach

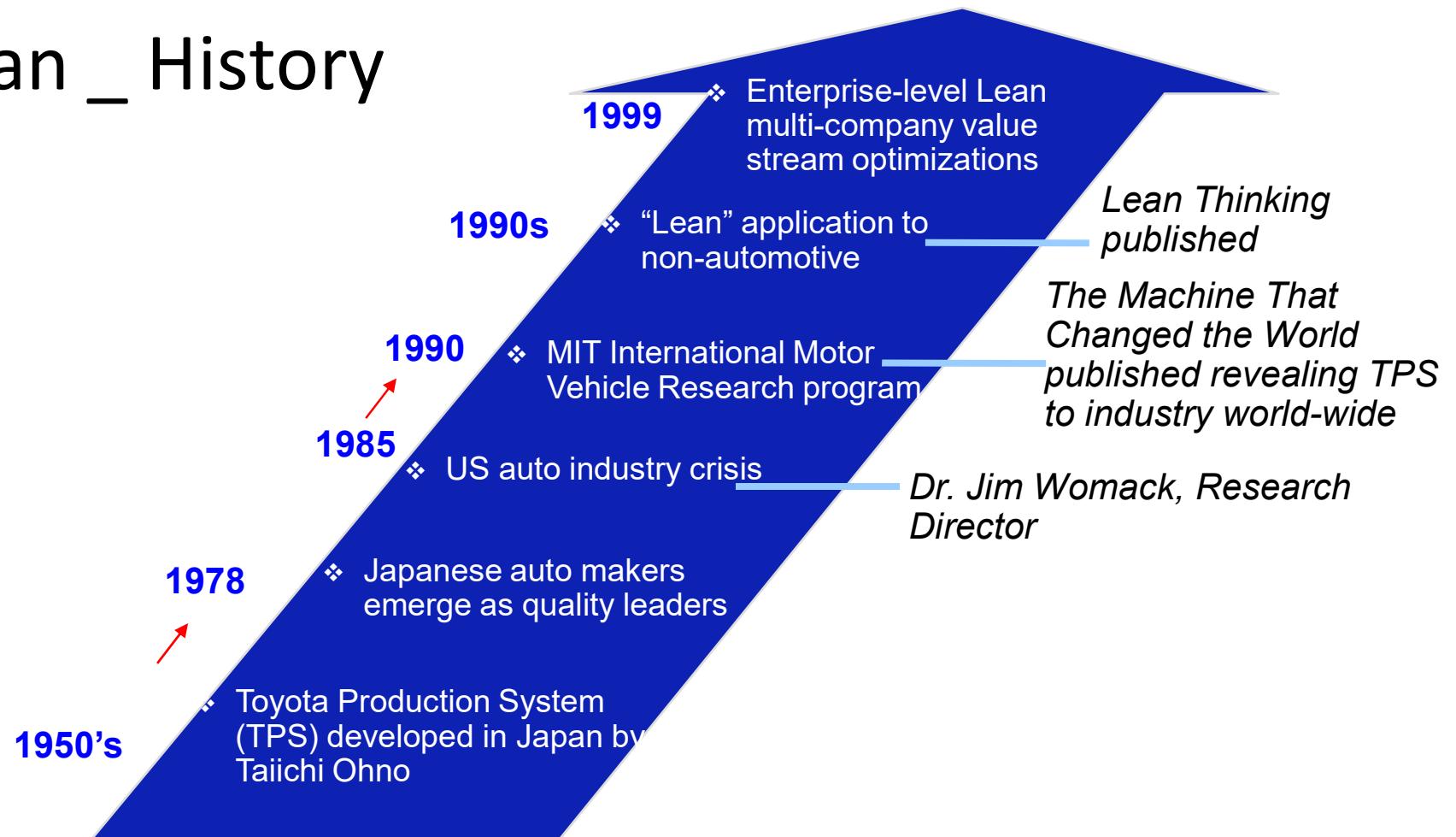


- Think and Speak based on personally verified, proven information and data.
 - Go to the facts and confirm
 - Complete responsibility for the information reported
- Taiichi Ohno Circle – Observe and Analyze yourself
- Difference between Japanese and Western Top Management Approaches

Lean _ History



Lean _ History

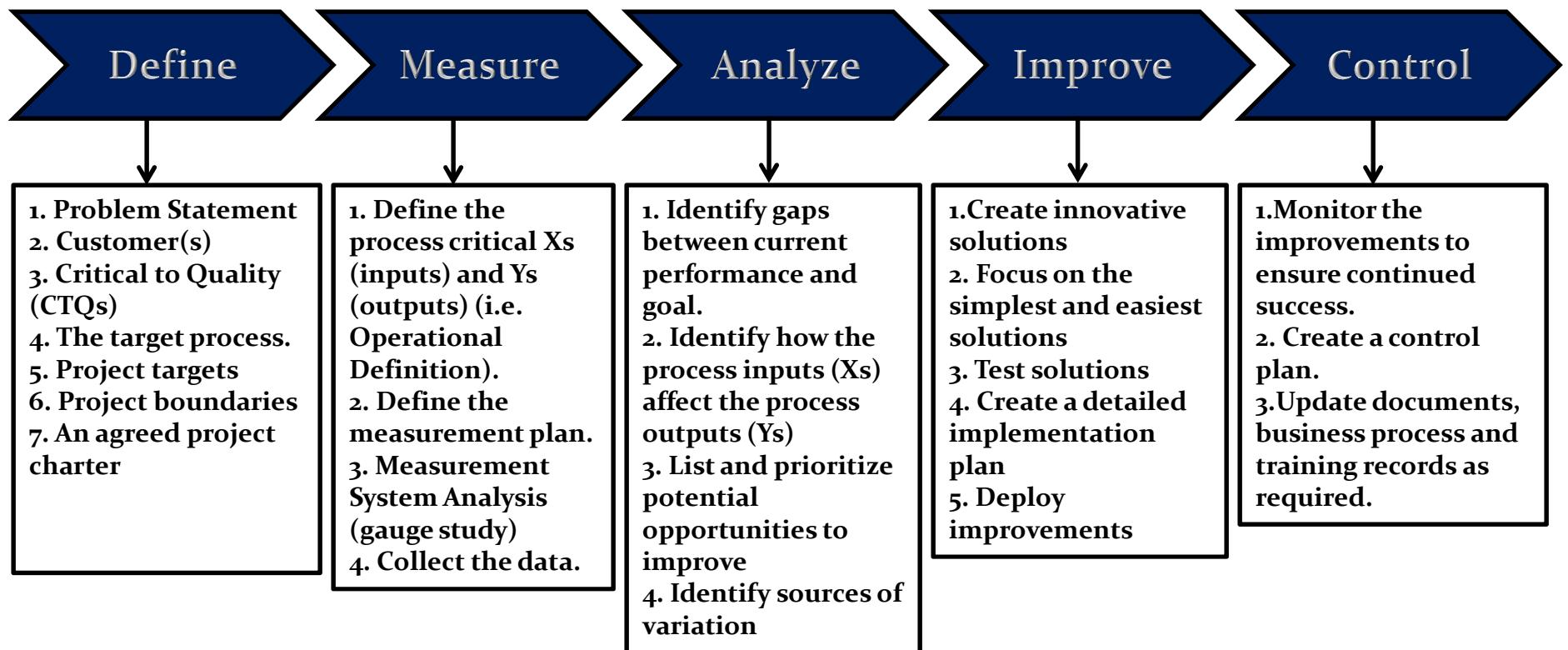


Project Suitable For Lean Six Sigma

As a final check in your project selection process, consider asking these simple questions

- Does this project address customers critical to quality (CTQ) issues?
 - Yes- Lean Six Sigma Project
 - No – Not Lean Six Sigma Strategically focused
- Does the project address revenue growth?
 - Yes- Lean Six Sigma Project
 - No – Not Lean Six Sigma Strategically focused
- Does the project address the cost reduction?
 - Yes- Lean Six Sigma Project
 - No – Not Lean Six Sigma Strategically focused
- Can it be completed with in three to five month?
 - Yes - Lean Six Sigma Project
 - No – Stop or rescope
- Is there sufficient “value creation” at stake (\$150-250K annual operating profit)?
 - Yes - Lean Six Sigma Project
 - No – Stop or rescope

DMAIC – Project management



Six Sigma_Data Driven Approach

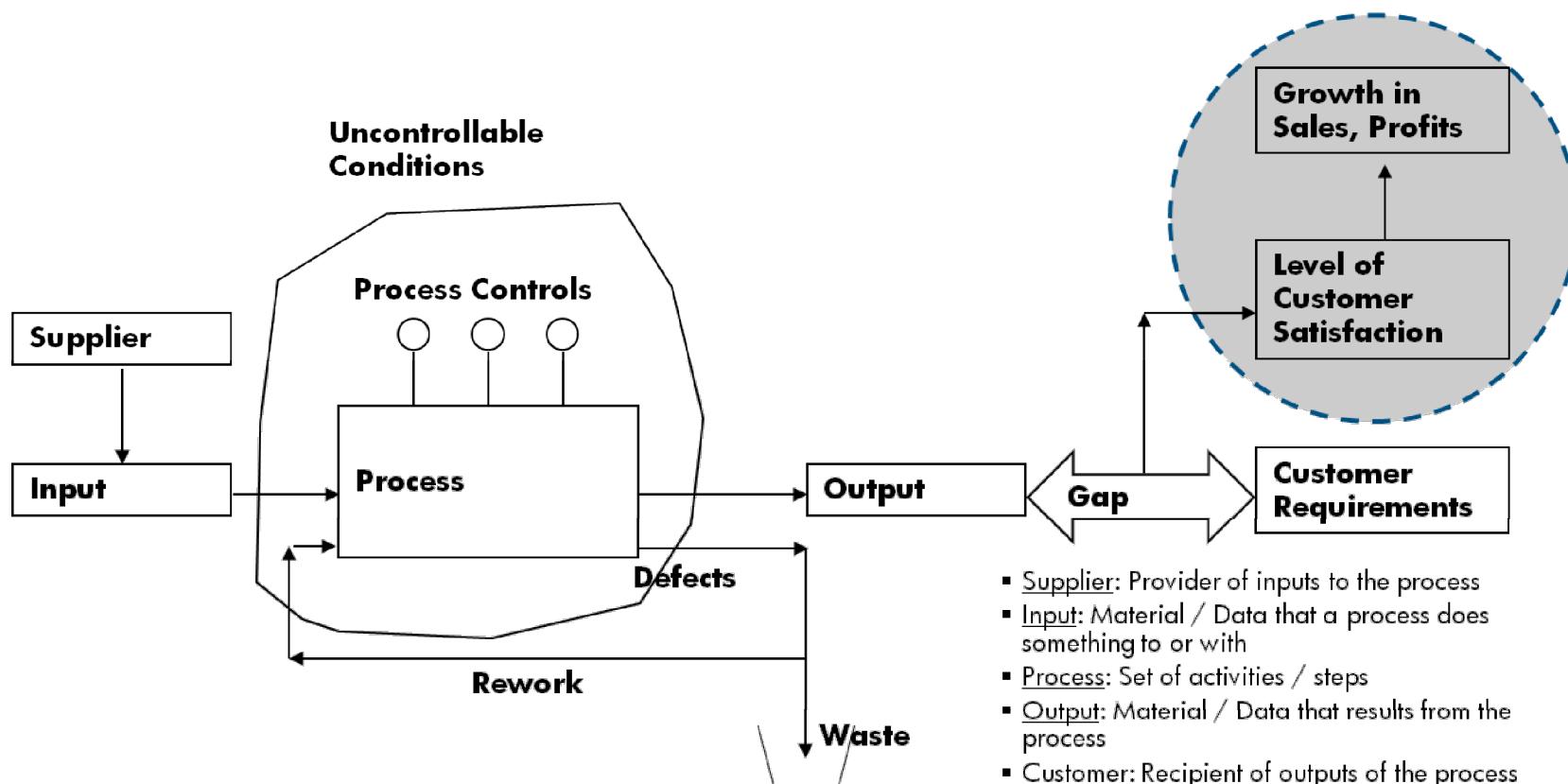
$$Y = f(X)$$

To get results, should we focus our behavior on the Y or X?

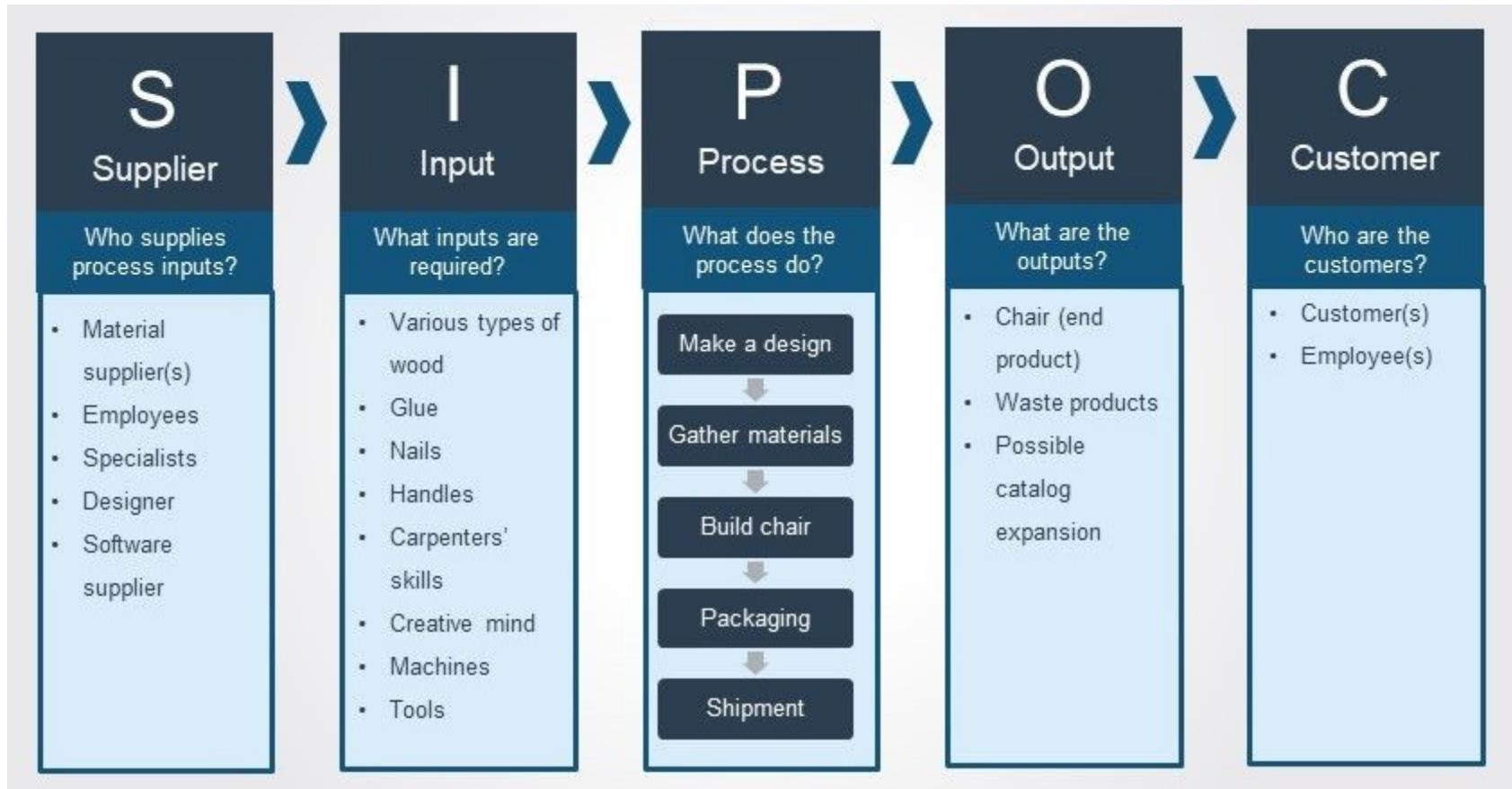
-
- | | |
|--|--|
| <ul style="list-style-type: none">• Y• Dependent• Output• Effect• Symptom• Monitor• Response | <ul style="list-style-type: none">• X1 . . . XN• Independent• Input• Cause• Problem• Control• Factor |
|--|--|

Is it feasible to eliminate the inspection of Y, if X's are controlled well?

SIPOC - Identifying stakeholders and customers



SIPOC – Sample



Measuring different voices

Voice of customer (VOC) :

- Voice of the Customer (often referred to as simply VoC) is a term used to describe the process of capturing customer's experiences, expectations, preferences and aversions. It is a process that provides a detailed set of customer wants and needs and often includes both qualitative and quantitative research methods. Basically – you collect feedback on your customer's experience with your products and services.
- Collected through Survey , Feedback form , Review , Voice calls

Measuring different voices

Voice of customer (VOB) :

- Voice of the Business are the needs, wants, expectations, and preferences, both spoken and unspoken, of the people who constitute (run) the business itself (e.g., shareholders, officers, or others involved in corporate governance)
 - Examples of business needs are revenue, growth, market leadership
- Business Review, Improvement workshop

Measuring different voices

Voice of Industry (VOI) :

- Voice of the Industry is a collective voices of problems faced by the industry as a whole, Often organizations who drive projects to solve issued raised as part of VOI will disrupt the market. These organizations will be the pioneer and have opportunities to accrue a larger market share
- Collected through Social media, Blogs, Survey

Measuring different voices

Voice of Process (VOP) :

- Voice of the Process is basically what the process is telling to you, in other words if a process owner is capable of listen to voice of process and take actions proactively he can in turn avoid negative VOC
- Collected through Reports , Dashboards and other MIS

Measuring different voices

Voice of Workforce (VOW) :

- Voice of the Workforce also referred as voice of workforce inputs and process improvement suggestions given by employees towards the process that they are working. This voice is very important and at times the most unheard voice
- Other voices will surface problem statements but this voice will also surface statement of opportunity
- Collected through Idea gen (or) Kaizen Portals. CI events

Determining critical requirements



Do we know what our customers want ?
Identifying who is our customer and
understating what our customers
expectation or requirements in our
product or process is the first step
towards customer satisfaction

Determining critical requirements



As customer who is using customer support / tech support what are your critical requirements ?

- ▶ Answer my call quickly
- ▶ Don't put call on hold
- ▶ Resolve query quickly
- ▶ Let me know if there will be delays
- ▶ Inform when query is fixed

Identifying performance metrics

‘What get measured get improved’.. so it is important to converts these statements in to measureable metrics

- ▶ Answer my call quickly
- ▶ Don’t put call on hold
- ▶ Resolve query quickly
- ▶ Let me know if there will be delays
- ▶ Inform when query is fixed



- ▶ Average Speed of answer
- ▶ Hold time per call
- ▶ # of holds per call
- ▶ Query resolution time
- ▶ % resolution on first contact
- ▶ Query resolution time
- ▶ % queries open beyond SLA, % informed to user
- ▶ % queries where resolution was communicated

But How to do this conversion ?

VOC to CTQ drill down

Voice of the customer (VOC)

Actual Customer Statement which reflect their perception of

- a) An Attribute of product or service
- b) An Experience of a product or service or its delivery
- c) An encounter or experience with a business process or its representative

Key Customer Issue (KCI)

The Real customer concern, Values or expectations regarding a product or service Void of emotion or bias, the statement describes the primary issue a customer may have with the product or services. Describes the experience surrounding the attributes of the product or service expected or desired by the customer

Critical Customer Requirements (CCR)

The specific, precise and measurable expectation which a customer has regarding a product or service.

Critical To Quality (CTQ)

key measurable characteristics of a product or process whose specification limits must be met in order to satisfy the customer

VOC to CTQ drill down – Example

Voice of the customer (VOC)

Documents are not delivered properly

Key Customer Issue (KCI)

Documents are not delivered on time and accurately

Critical Customer Requirements (CCR)

CCR1 : Documents to be delivered within 24 Hrs of TAT

CCR2 : 95% of accuracy to be met

Critical To Quality (CTQ)

CTD 1: No of hrs taken to deliver document

CTQ 2: % of accuracy achieved.

CTQ requirements

- Truly critical to customer / business based on customer / business needs
- CTQ must be measurable
- Must be defined with a Operational definition
- Unit of measurement must be clearly defined
- Should have specification limits / Target

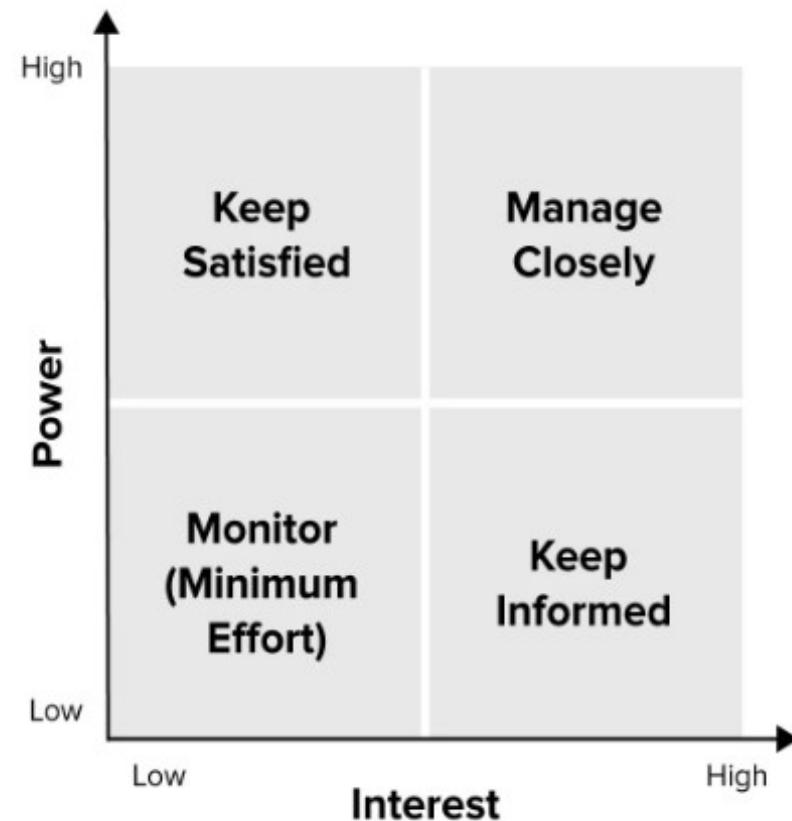
Stakeholders Analysis - Steps

Stakeholder Analysis is the first step in Stakeholder Management, an important process that successful people use to win support from others.

- Identify Your Stakeholders
- Prioritize Your Stakeholders
- Understand Your Key Stakeholders

Prioritize Your Stakeholders

You may now have a list of people and organizations that are affected by your work. Some of these may have the power either to block that work or to advance it. Some may be interested in what you are doing, while others may not care, so you need to work out who you need to prioritize



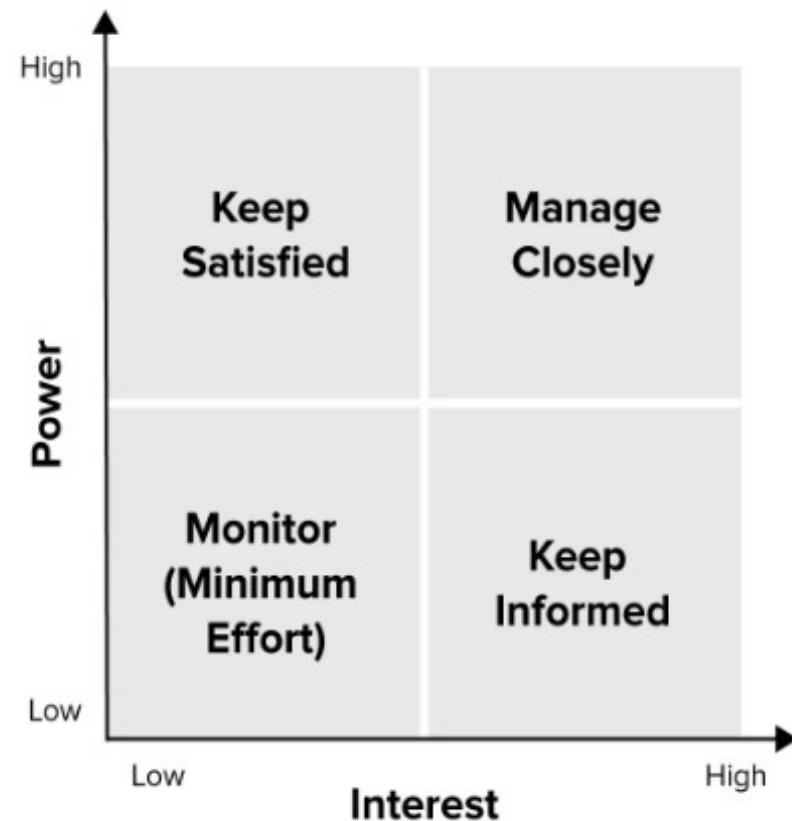
Prioritize Your Stakeholders

High power, highly interested people (Manage Closely): you must fully engage these people, and make the greatest efforts to satisfy them.

High power, less interested people (Keep Satisfied): put enough work in with these people to keep them satisfied, but not so much that they become bored with your message.

Low power, highly interested people (Keep Informed): adequately inform these people, and talk to them to ensure that no major issues are arising. People in this category can often be very helpful with the detail of your project.

Low power, less interested people (Monitor): again, monitor these people, but don't bore them with excessive communication.



Stakeholders Analysis – RACI Chart

RACI is an acronym that stands for Responsible, Accountable, Consulted, and Informed. The RACI categorization provides clarification of responsibilities that each party plays in relation with activities that are needed to be performed and decisions that have to be accomplished.

- Responsible: Does the work to achieve the task
- Accountable: Has authority to approve or disapprove the result
- Consulted: Possesses needed input to the task
- Informed: Needs to be informed of the result

Stakeholders Analysis – RACI Chart

RACI Matrix for Task Assignment

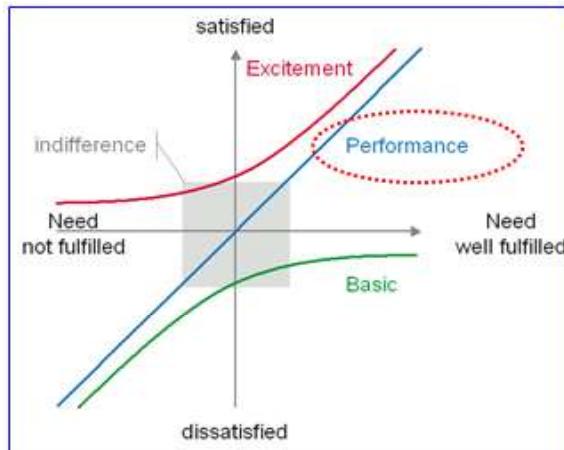
Task	Role	Role 1	Role 2	Role 3	Role 4	Role 5	Role 6
Task 1		R		C			
Task 2		R		A		C	
Task 3		R	R	I	A		I
Task 4				C		R	
Task 5		A	C		I		
Task 6			I	C	C		R

Legend:

- Responsible (Dark Teal)
- Accountable (Medium Teal)
- Consulted (Light Teal)
- Informed (Very Light Teal)

Project prioritization

Kano Prioritization



Effort-Impact

		IMPACT	
		HIGH	LOW
EFFORT	HIGH		
	LOW	✓	



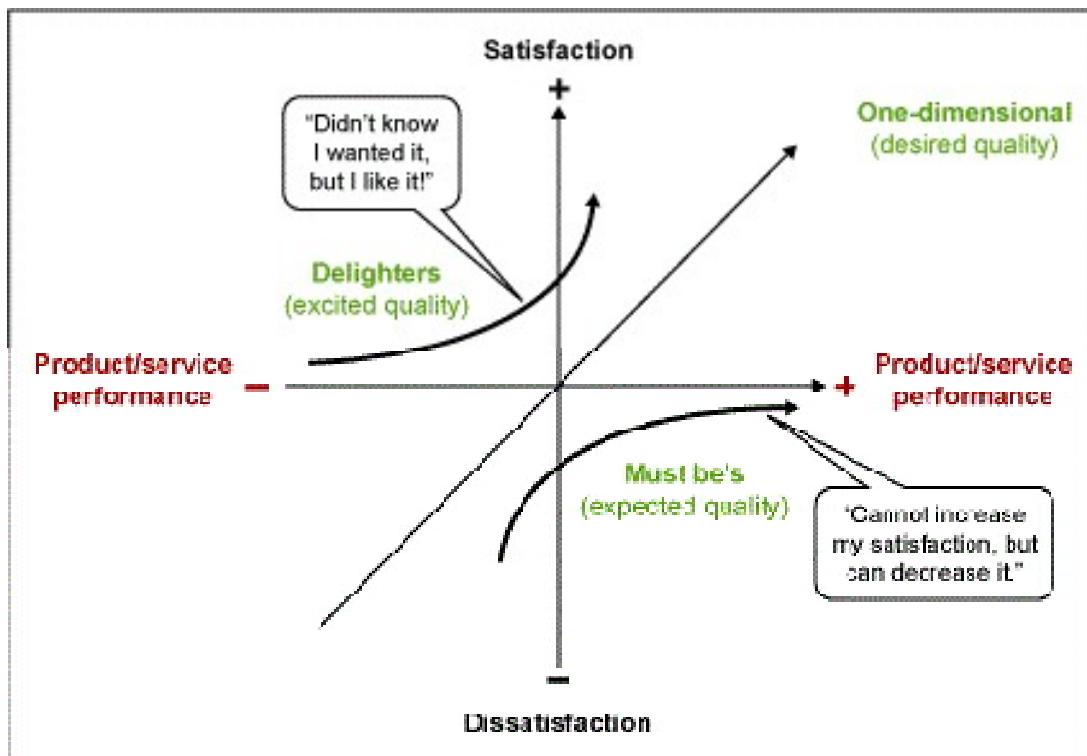
FIPS Validation

Sl.No	Parameters	Status		
		Low	Medium	High
1	Feasibility			✓
2	Impact			✓
3	Potential			✓
4	Support			✓

Kano Model

- Categorizing Customer Needs
- Must Be – Customer expects and gets dissatisfied with unfulfilled service
- More is Better – Linear effect on customer satisfaction
- Delighter – Customer retention and repeat business

Kano's Arrow diagram



List down the CTQs identified and categories as

- Dissatisfiers
- Satisfiers
- Delighters

Give first preference to Dissatisfiers, Followed by satisfiers and make sure atleast there are few delighters

Effort and Impact analysis

		IMPACT	
		HIGH	LOW
EFFORT	HIGH	2	4
	LOW	1	3

Analyze the list of identified CTQS in a 2 by 2 Effort (vs) Impact grid

Prioritize the CTQs as per sequence in the image

Sl.No	Parameters	Status		
		Low	Medium	High
1	Feasibility			✓
2	Impact			✓
3	Potential			✓
4	Support			✓

Analyze Feasibility , Impact , Potential and support available for the project and prioritize the CTQs

Business case

Business case helps to understand how the project is linked with the overall business objectives. Business case explains why there is a need for the organization to undertake the project and how it will support organizational objectives

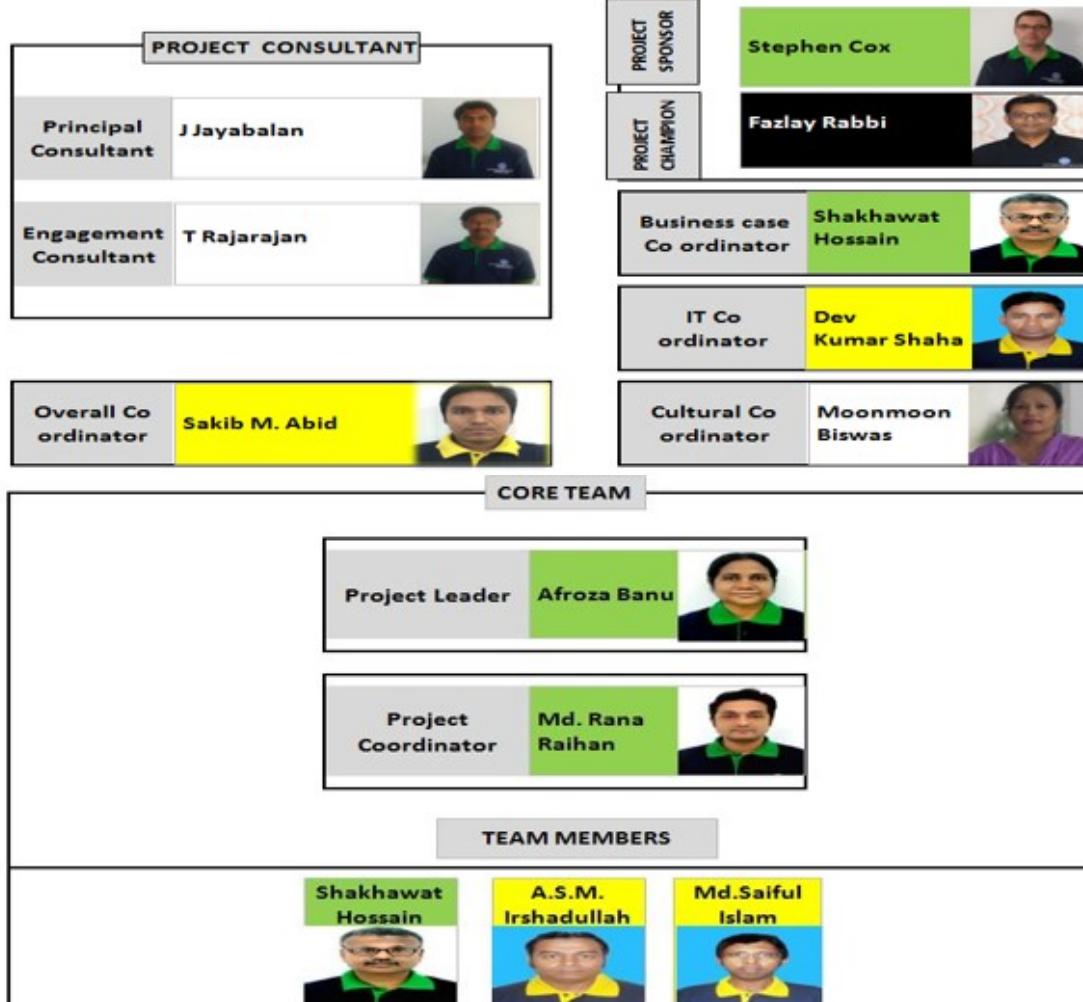
The business case should be able to answer the following questions:

- Why is the project worth doing? Justify the resources necessary to engage in the project.
- Why is it important to customers?
- Why is it important to the business?
- Why is it important to employees?
- Why is it important to do it now?
- What are the consequences of not doing the project now?
- How does it fit with the operational initiatives and targets?

LEAN SIX SIGMA

DEFINE

LSS Deployment Team Planning



Major roles that need to be filled for a successful project.

- Yellow Belts
 - Green Belts
 - Black Belt
 - Master Black Belt
 - Project Champion
 - Project Sponsor

Roles and Responsibilities Card	
Name	Designation
Sharif Adnan Haque	Engineering Officer
Team Member	Phase
RMEA	All
Data Collection	All
Machine cleaning cum Inspection Sheet	All
Risk Analysis	All
Documentation	All

Project Charter

Project charter is the first step in a Lean Six Sigma project, it is the binding document between the project sponsor and the project team. Developing , Getting sponsors approval and publishing the Six Sigma project charter are the initial steps in commissioning a project

Clarifies what is expected of the team

Keeps the team focused

Keep the team aligned with process priorities

Project Charter – 7 Elements

- Problem / Opportunity Statement
- Goal statement
- Project Scope
- Project Plan (Time line)
- Team Structure
- Potential cost and benefits
- Operational definition and defects definition of CTQ

Problem Statement

A problem statement should answer the following six questions

- **What is the problem – Metric that we are trying to improve**
- **Where is the problem – Boundaries (Scope)**
- **When was the problem observed – Durations with Time stamp**
- **How much – Against the expected performance level what is the current performance**
- **How do you know - Source of data**
- **What is the financial impact – By living with this problem what is the financial impact**

Goal Statement

A Goal statement should explain what the project is intended to achieve, a goal statement should answer the following three questions

- **What is the current level (Baseline) of the process?**
- **What is the target (Entitlement) for the process?**
- **When it is expected time by which the target will be achieved?**

A Goal statement should follow a SMART approach

Project Charter – Template & Sample

Project Charter , Project Goal and Team

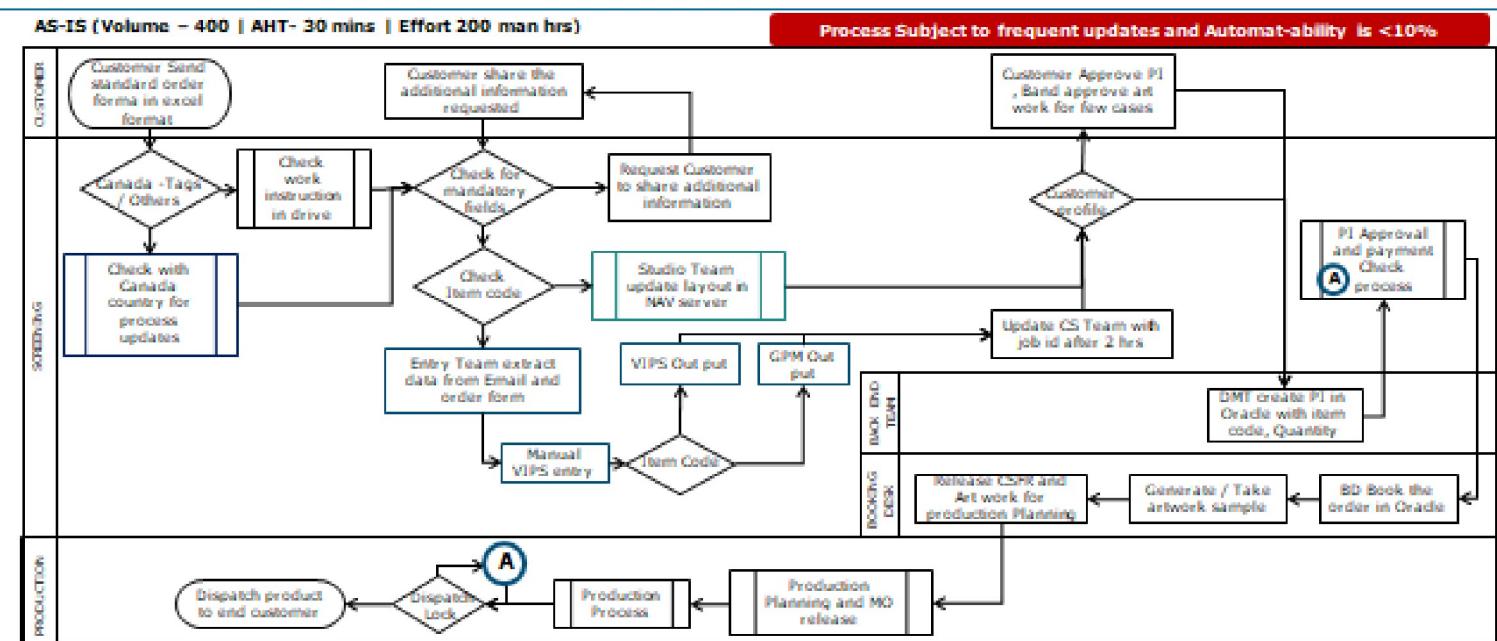


Business case		Project Potential benefits					
<p>Ashghal asset management team is managing 272 LCD projectors installed across 24 schools in Duhail region, as per the assets management SLA agreement contract we are required to maintain asset down time of less than 10% how ever the actual down time is at 18.4% which lead to customer dissatisfaction and this would lead to a service penalty of <u>xxxxx Qatar Riyal</u></p>		<p><u>Operational Benefit :</u> •Customer satisfaction •Reduction of Escalation effort <u>Financial Benefit :</u> Avoiding service penalty of <u>xxxxx Qatar Riyal</u></p>					
Statement of Opportunity		Project team					
<p>There stands an opportunity to reduce the LCD projector down time to meet SLA requirements, improve customer satisfaction and avoid service penalty.</p>		Project Lead (BB)	Dileep K Manager – Asset management				
Project Goal		Project Team	Asset management team				
<p>To reduce LCD projector down time from 18.06% to 10% before December 2019</p>		Customer	Primary school department				
Scope		Project Sponsor	Ashghal governance committee				
In scope	272 LCD Projectors Installed in 24 schools in Duhail region	Project Champion	Raqibul Alam				
Out of scope	All other assets in Duhail region and projects in other regions	Quality Coach (MBB)	Zahidul Mahin				
Time Lines		Yellow belt	Jayabalan				
		Operational Definitions					
Phase	Define	Measure	Analyze	Improve	Control		
Plan	Aug'19	Sep'19	Oct'19	Oct'19	Dec'19	Project Y : Asset down time % = 1 - (total assets down time / (272*24hrs)) Defect : Any day with asset down time greater than 10% Opportunity : 272 LCDs daily	
Actual	Aug'19	Sep'19	Oct'19	Nov'19	Dec'19	Note : Financial values masked in external PPT	



Mapping As-Is process flow

AS-IS PROCESS FLOW BRAND7 ORDER



Trusted partner for your Digital Journey



We need to develop a As-Is process flow as granular as possible

Mapping As-Is process flow – Steps

Stage 1

- Request for a documented process (SOP) form the process owner
- Study the documented process
- Create a process flow based on your understanding
- Check with the process owner if your process flow is inline with the document process

Stage 2

- Spend a “Day in the Life of (DILO)” the processor and work-shadow the processor
- Pick up random transaction and travel to different departments and track how the transaction is processed

Stage 3

- Highlight the deviations observed in the shop floor and the documented process to the process owner

Stage 4

- Request the process owner to confirm the final version with written approval

Stage 5

- Document the final version of process flow in project PPT

Define Phase key deliverables

- Project Charter approved by Project Sponsor
- As – Is process flow approved by process owner



Practice the philosophy of
continuous improvement. Get a
little bit better every single day.

— *Brian Tracy* —

