Ali & Sons Holding
White Belt Training

January 2022

Office rules & information

| Safety & Exits	Coffee & smoking locations	Prayer Room & Toilets	Mobile usage & cleanliness

Agenda

Ali & Sons
SINCE 1979

Objectives of the training

- Understand the Lean Six Sigma methodology

- Identify the benefits of using Lean Six Sigma

- Recognize the wastes in processes

- Help the Group adopt new cost-saving practices

- Facilitate the conversion of ideas from the Group to projects that can yield monetary benefits.

LSS – Ali & Sons
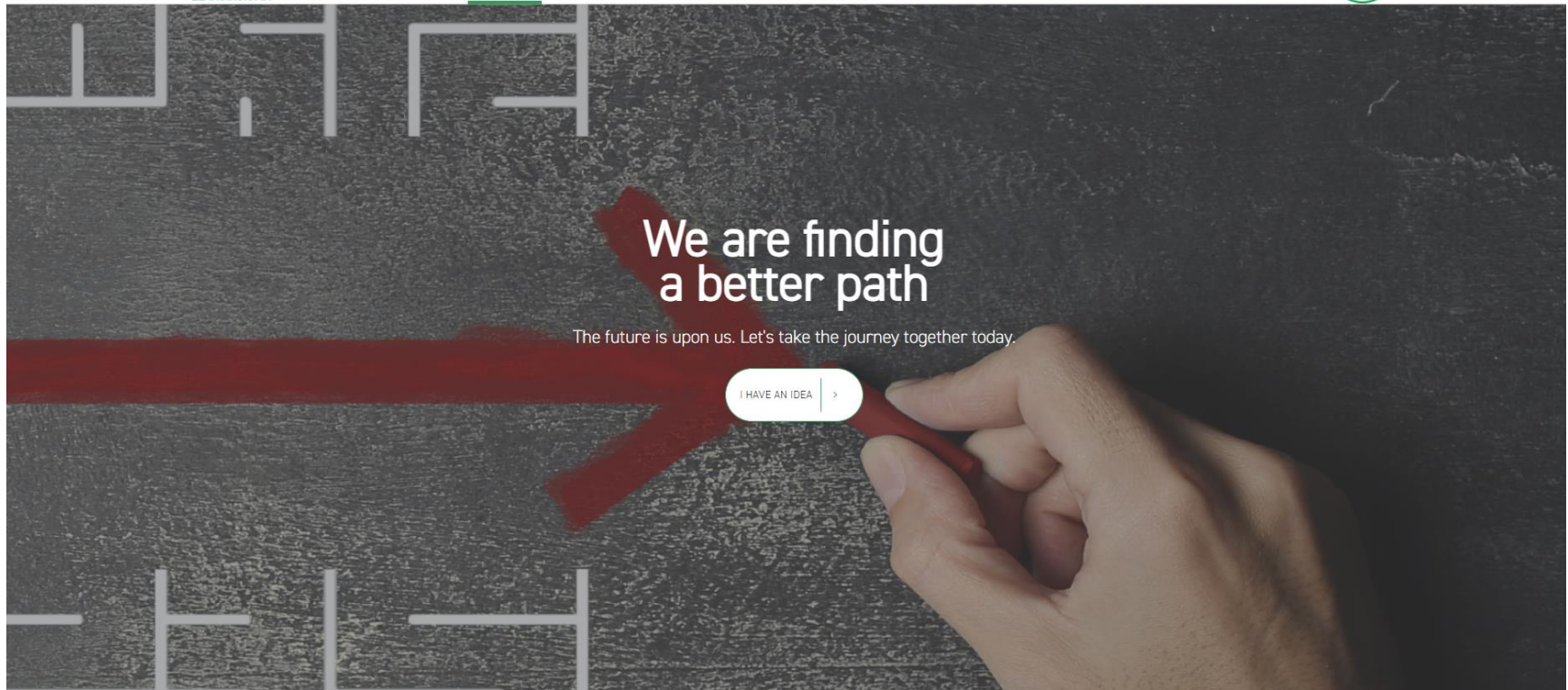

It's time to find a new path. Welcome to a new day where we eliminate wastes and create a more efficient culture through Lean Six Sigma, a methodology that combines process speed with quality that will help us build a new kind of effectiveness.

Lean – Overview

- Lean methodology focuses on eliminating wastes or non-value-adding component in any processes.

- Lean generates huge improvements in efficiency, cycle time, productivity, material costs and scraps.

- Lean means creating more value for customers with fewer resources.

Before Lean

After Lean
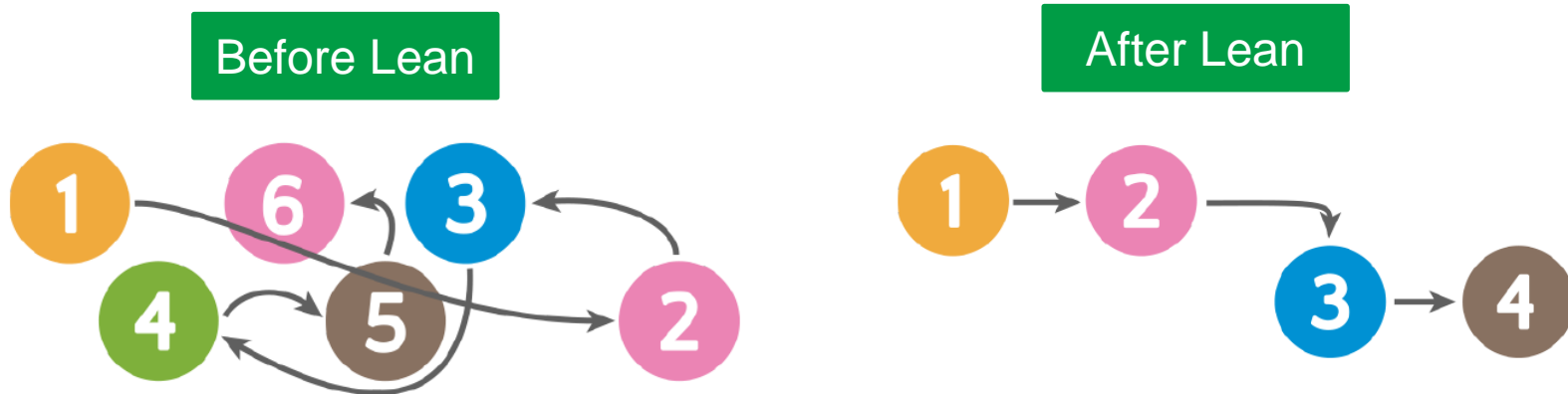
Lean – 5 key principles

1

VALUE

Value is defined by customer needs. Lean producers focus on what customers will pay for, whether it is quality, delivery date, price point, or other requirements or expectations.

2

VALUE STREAM

Map all the steps, from raw materials to delivery, used to make a product and identify and eliminate each step that does not create value.
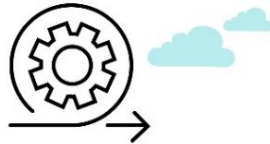
3

FLOW

After removing waste, lean companies ensure the remaining production steps flow smoothly without interruptions, delays, or bottlenecks. This may require cross-functional collaboration across all departments.

4

PULL

Improved flow slashes time to market, so producers can deliver products as needed. "Just in time" manufacturing reduces the need to build or buy products in advance, saving money for manufacturers and their customers.

5
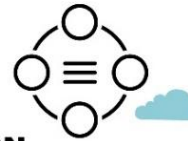
PERFECTION

Lean thinking and process improvement is never done. As gains continue to pile up, every employee should be involved in implementing lean principles to achieve ongoing improvement.

Value Stream Map

Receive Order	Process Order	Prepare Food	Package Food
⟳ 1	⟳ 1	⟳ 3	⟳ 1
PT= 1 min	PT= 2 min	PT= 10 min	PT= 5 min
CT=1 min	CT=2 min	CT=5 min	CT=2 min
A=100%	A=100%	A=90%	A=100%

I = 50

I=32

1 min   2 min   10 min   5 min   20 min | 37 min |
5 min   2 min   5 min   5 min   5 min | 22 min |

Lean – One Piece Flow

Lean – Types of wastes

T **TRANSPORTATION**
Moving items or information

I **INVENTORY**
Items or information that customer has not received

M **MOTION**
Excessive movement within workspace

W **WAITING**
Waiting for information or items to arrive

O **OVERPROCESSING**
Doing more work than necessary

O **OVERPRODUCTION**
Doing work before it is needed

D **DEFECTS**
Mistakes and errors that need to be reworked

S **SKILLS**
Not using workers to fullest of abilities

Lean – Toolbox

Lean Wastes	A core principle of lean—reducing and eliminating waste
Value Stream Mapping	Follows a product's production path from beginning to end and draw a visual representation of every process in the material and information flows.
Flow	Product proceeds from design to launch, order to delivery, and raw to finished materials in the hands of the customer with no stoppages, scrap, or backflows.
5S	Results in a workplace that is clean, uncluttered, safe, and well organized to help reduce wastes and optimize productivity.

Lean tool – 5S

Provides a methodology for organizing, cleaning, developing, and sustaining a productive work environment
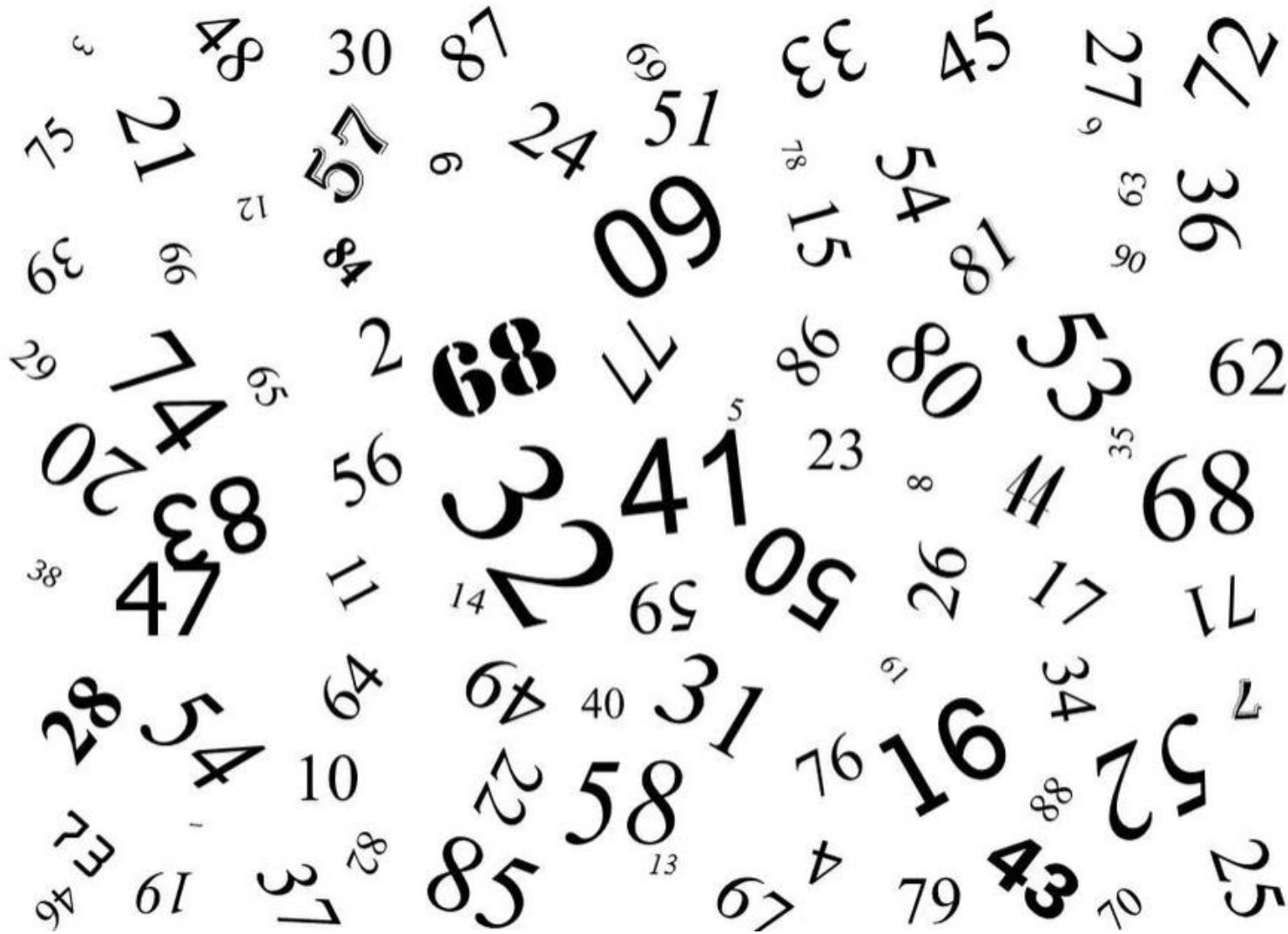

Before implementing 5S

After implementing 5S

Numbers from 1 to 49

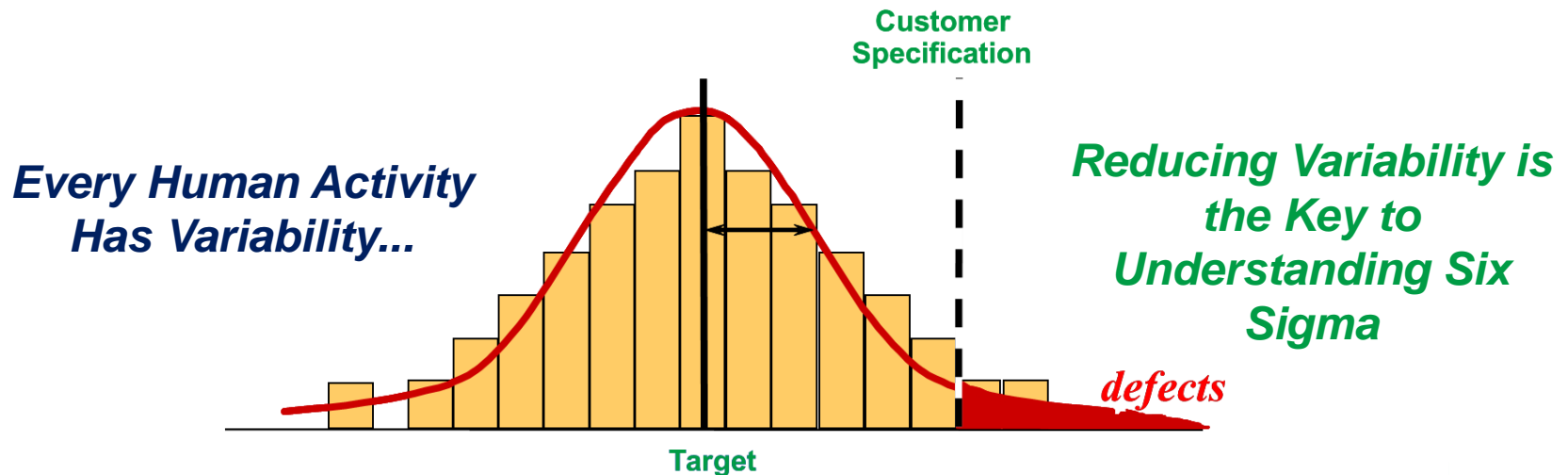| 1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17		19	20
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31	32	33	34	35	36	37	38	39	40
41		43	44	45	46	47	48	49	

What is Six Sigma?

What is Six Sigma?

Sigma (σ)

Sigma (σ) is a statistical concept that represents how much variation there is in a process relative to customer specifications.

Six Sigma (6σ)

Six Sigma (6σ) is equivalent to 3.4 "defects per million opportunities" (DPMO). The variation in the process is so small that the resulting products and services are 99.99966% defect free.

Customer Specification

Every Human Activity Has Variability...

Reducing Variability is the Key to Understanding Six Sigma

defects

Target

Six Sigma Example

One Sigma = 170 misspelled words per page in a book

 Two Sigma = 25 misspelled words per page in a book

Three Sigma = 1.5 misspelled words per page in a book

Four Sigma = 1 misspelled word in 300 pages

Five Sigma = 1 misspelled word in the Encyclopedia Britannica

 Six Sigma = 1 misspelled word in all the books in a city library

Sigma Level
2
3
4
5
6

Objectives of Six Sigma

Customer-focused business improvement process

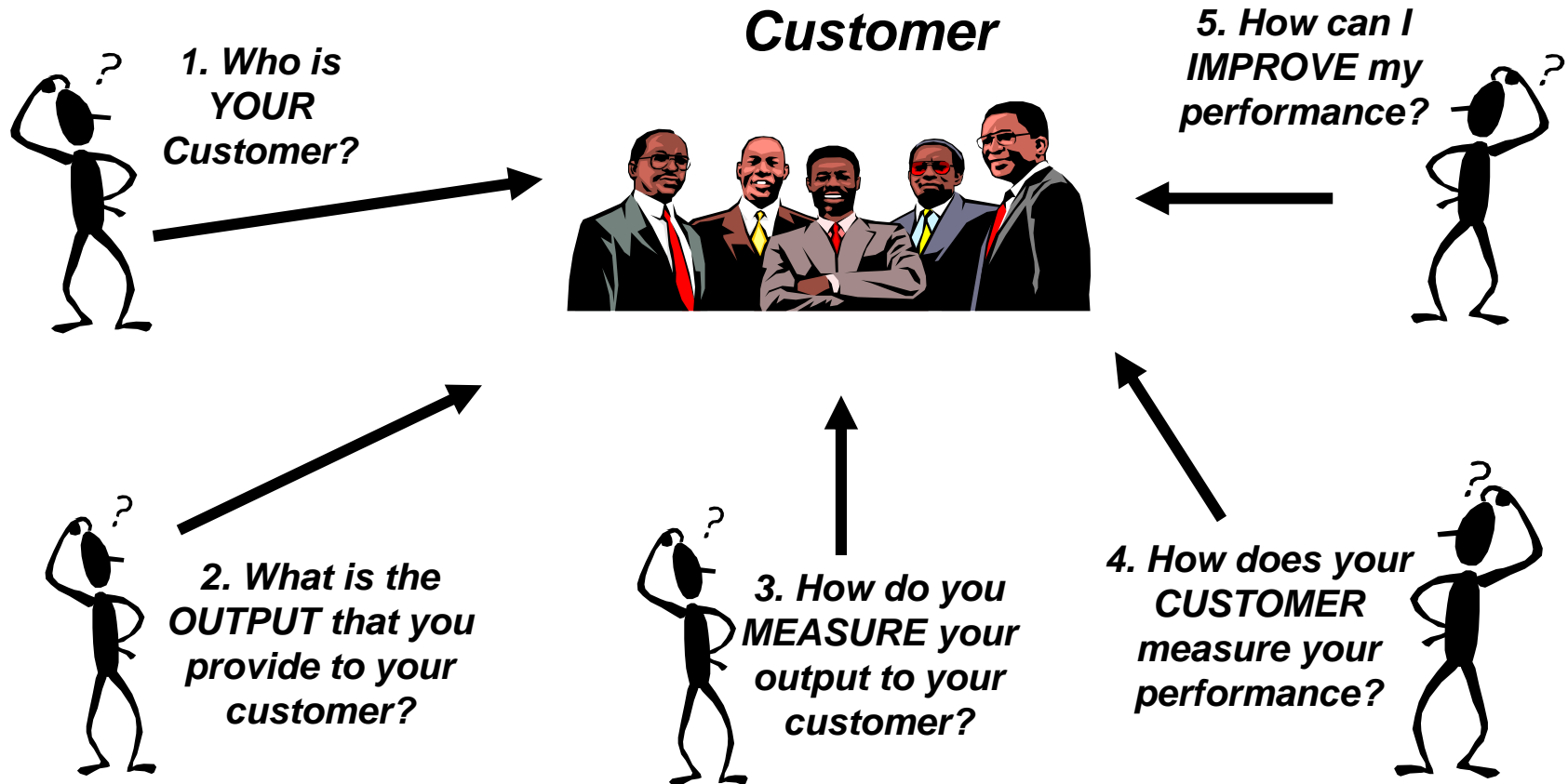Defect reduction in a process or product

Enhanced capability

Increased bottomline

Focus of Six Sigma

Why Six Sigma?

The 3 sigma Company	The 6 sigma Company
• Spends 15~25% of sales dollars on cost of failure	• Spends 5% of sales dollars on cost of failure
• Does not have a disciplined approach to gather and analyze data	• Use Measure, Analyze, Improve, Control and Measure, Analyze, Design
• Benchmarks themselves against their competition	• Benchmarks themselves against the best in the world
• Believes 99% is good enough	• Believes 99% is unacceptable
• Define CTQs internally	• Defines CTQs externally
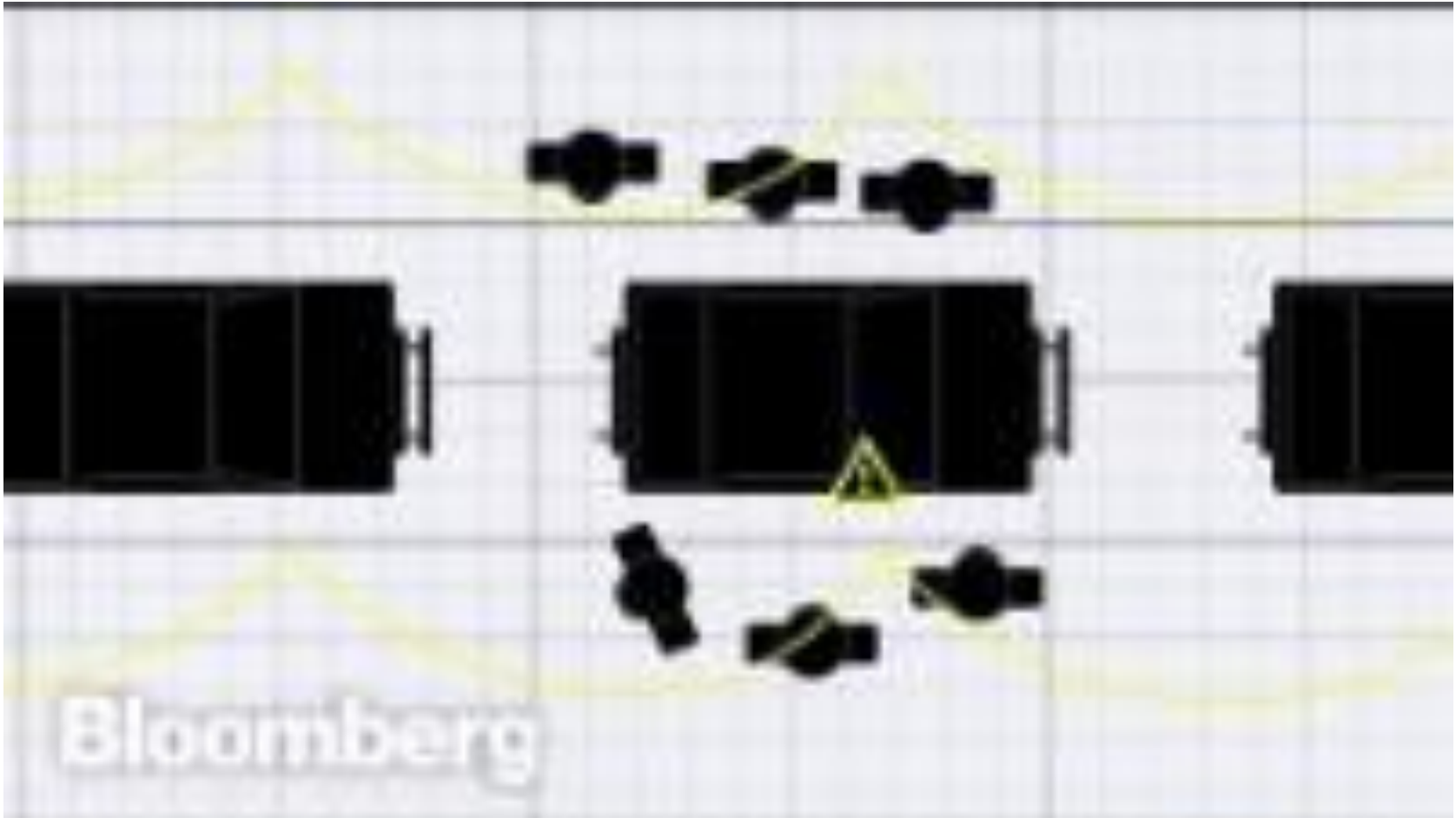
Six Sigma Methodology

Six Sigma as a methodology provides an organized, specific, repeatable means of assessing and resolving challenges through a process titled….

Define → **Measure** → **Analyze** → **Improve** → **Control**

This approach yields a focus on **cause and effect** with analytical problem-solving tools within a management structure to assure results.

Six Sigma - Example

Define Phase

Objective
Define the problem, improvement activity, opportunity for improvement, the project goals, and customer (internal and external) requirements.

Key Deliverables

AS IS map
To provide overview of an entire process, starting and finishing with the customer, and analyzing what is required to meet customer needs.

Voice of the customer
To understand feedback from current and future customers indicating offerings that satisfy, delight, and dissatisfy them.

Project charter
Project charter to define the focus, scope, direction, and motivation for the improvement team.

Define Phase – Project Charter

Lean Six Sigma – Project Charter

Ali & Sons

7. Expected Benefits / Impact
Operational Benefits:
Eliminating rental agents processes for creation of VDR. End to end visibility of vehicle movement in Gateway. Increasing quality with taking photo as required. Documents will be automatically upload in system and shared with customer.
Financial Benefits:
Saving time of agents and printing/archiving costs. Unnecessary movement for documentation will be eliminated.

8. Project Scope
In Scope:
Eliminating manual tasks for inspection recording archiving and sharing with Gateway mobile application.
Out of Scope:
Accountability requirements for inspection, vehicle delivery and follow up.

9. Project Milestones
Phase 1 results: 30th June 2021 • Time measure/record for Musaffah / Dubai / Salam Street branches. • Data collection. • Identify costs and potential savings. *Phase 2 results: 30th July 2021* • Identify improvement ideas. • Measure / collect new data with Gateway smart phone application. • Finalize hard and soft savings.

10. Major Known Risks (including significant assumptions)

Risk	Risk Rating (HI, Med, Low)	Mitigation
Eliminating key accountable of a process.	Low	All process stages will be discussed with process owners.
Increasing workload of process owners.	Med	Process owners will approve before alteration.
Availability of project related data/quality data	High	Data collection will be done by LSS team with process owners.
Stakeholders actions for delays in project	High	Deadlines will be approved by management.
Lack of communication during the project to stakeholders	Med	Proper communication strategy

Define Phase – SIPOC

Suppliers	Inputs	Process	Outputs	Customers
who is providing input to a process	resource provided by supplier for incorporation to process	steps taken to convert input to output	resource resulting from process	receiver of newly created output

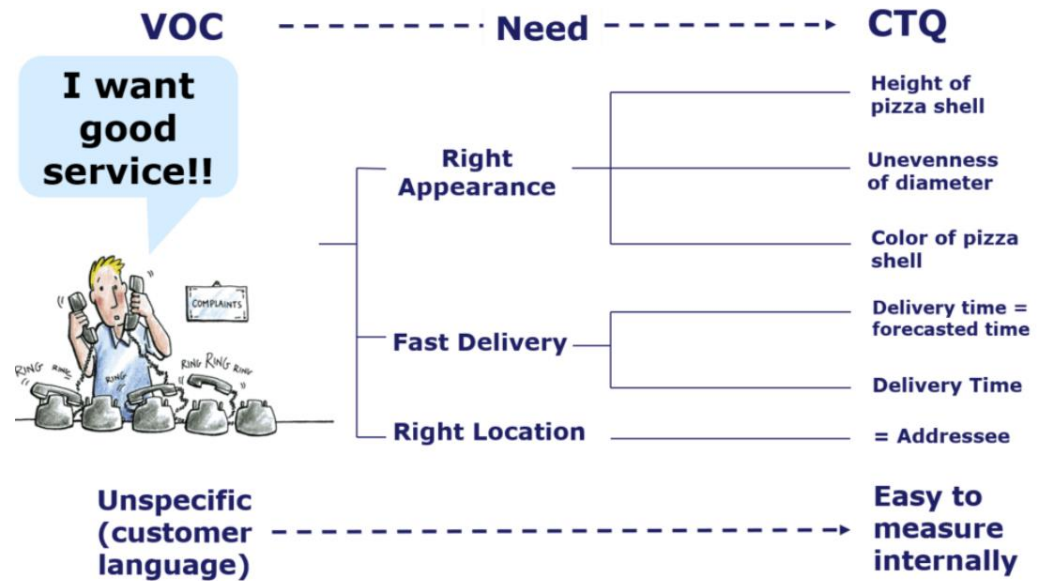| PROCESS TITLE:	VEHICLE REPLACEMENT / MOVEMENT			
SUPPLIERS	**INPUT**	**PROCESS**	**OUTPUT**	**CUSTOMER**
Sales Team	Customer details	Create vehicle replacement form in Gateway	Vehicle replacement form	Client
Operations Team	Customer requirements	Print/handover VR and VDR forms	Vehicle damage report form	
	Contract details	Inspect the car, fill the VR and VDR forms	Replaced / transferred car	
	Movement details	Get client signature		
		Handover filled forms to rental agent		
		Scan and upload forms		
		Archive forms		

Define Phase – CTQ

CTQ is a metric that reflects what the customer wants and that we can measure internally.

The CTQ
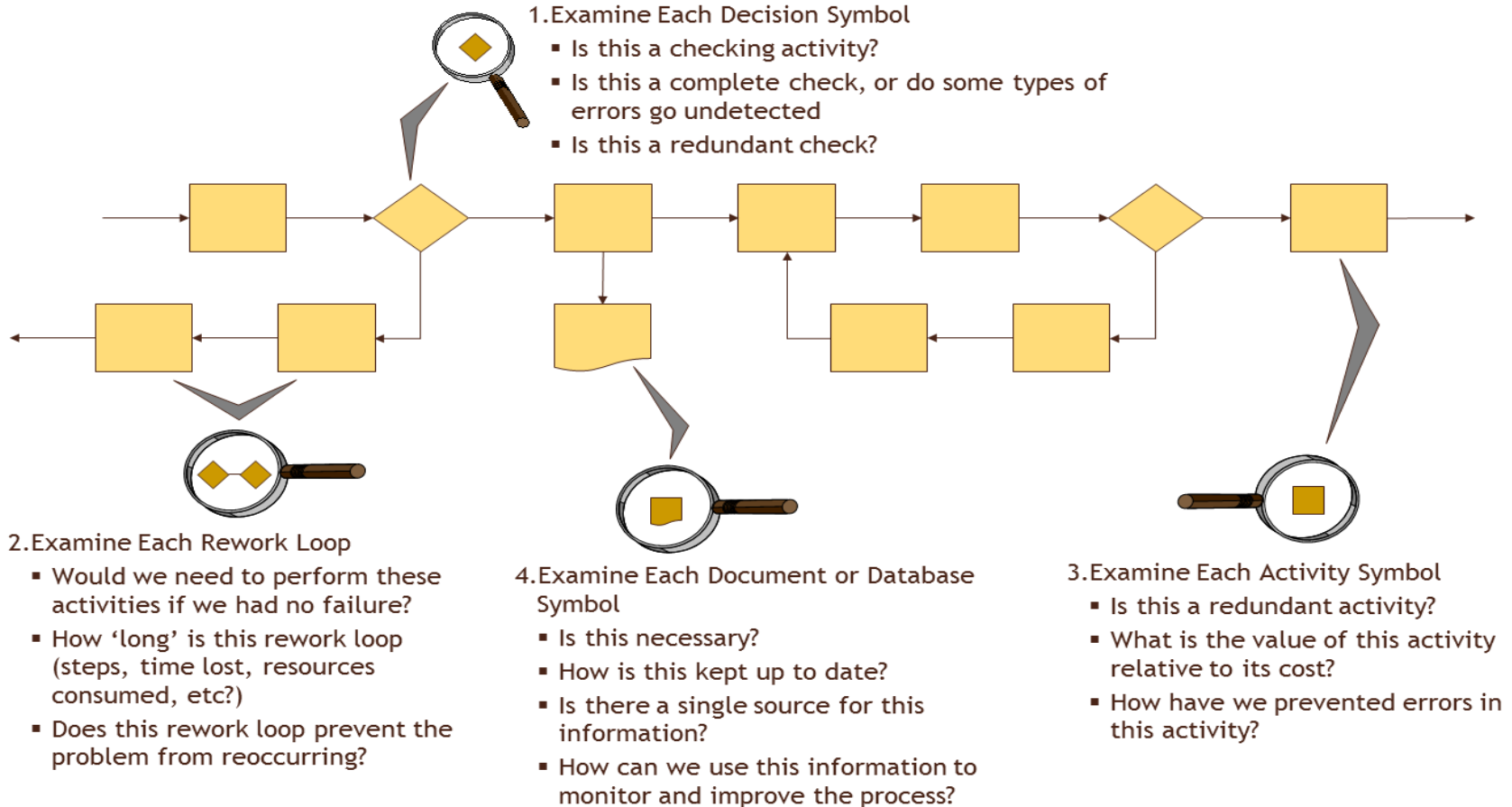- is the deliverable of the **"Voice of the Customer" (VOC)** tool
- must be measurable

To translate the Voice of the Customer into CTQs
- organize the information as statements in customer language
- group the customer needs and break the information down from customer language to internal measurable characteristics (CTQ-Tree)

Process Mapping - Approach

1. Examine Each Decision Symbol
   - Is this a checking activity?
   - Is this a complete check, or do some types of errors go undetected
   - Is this a redundant check?

2. Examine Each Rework Loop
   - Would we need to perform these activities if we had no failure?
   - How 'long' is this rework loop (steps, time lost, resources consumed, etc?)
   - Does this rework loop prevent the problem from reoccurring?

4. Examine Each Document or Database Symbol
   - Is this necessary?
   - How is this kept up to date?
   - Is there a single source for this information?
   - How can we use this information to monitor and improve the process?

3. Examine Each Activity Symbol
   - Is this a redundant activity?
   - What is the value of this activity relative to its cost?
   - How have we prevented errors in this activity?

Measure Phase

Objective	The purpose of the measure phase is to understand the extent of the problem with the help of **data**. In other words, measure the process performance in its current state in order to understand the problem.

Key Deliverables

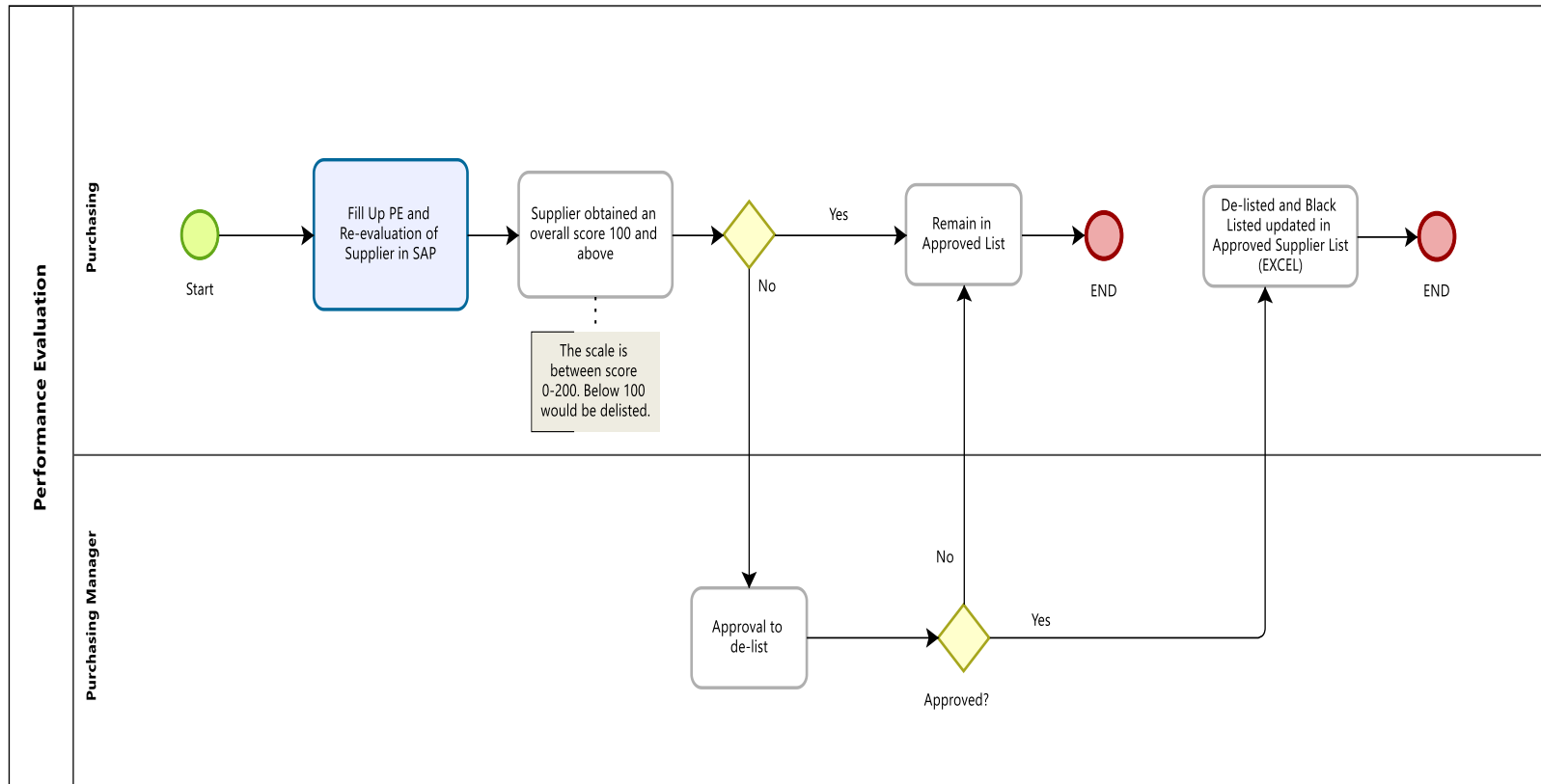| Process map	To record the activities performed as part of a process
Capability analysis	To assess the ability of a process to meet specifications
Pareto chart	To analyze the frequency of problems or causes

Measure Phase – Process Map

Performance Evaluation

Purchasing

Start → Fill Up PE and Re-evaluation of Supplier in SAP → Supplier obtained an overall score 100 and above → [decision] — Yes → Remain in Approved List → END

The scale is between score 0-200. Below 100 would be delisted.

De-listed and Black Listed updated in Approved Supplier List (EXCEL) → END

Purchasing Manager

No

Approval to de-list → [Approved?] — Yes

No

Analyze Phase

Objective	Analyze the process to determine **root causes** of variation and poor performance (defects).

Key Deliverables

Root cause analysis	Root cause analysis (RCA) to uncover causes.
FMEA	Failure Mode and Effects Analysis (FMEA) for identifying possible product, service, and process failures.
Multi-vari chart	Multi-vari chart to detect different types of variation within a process.

Analyze Phase – Key Tools

Root Cause Analysis/
  5 Why analysis

Improve Phase

| Objective | Improve process performance by **addressing and eliminating the root causes.** |

Key Deliverables

| Design of experiment | (DOE) to solve problems from complex processes or systems where there are many factors influencing the outcome and where it is impossible to isolate one factor or variable from the others. |

| Kaizen event | to introduce rapid change by focusing on a narrow project and using the ideas and motivation of the people who do the work. |

Weighted Criteria Matrix

Design of Experiment

Project Selection Criteria Matrix with Weighted Score

This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

Project/Criteria & Weight	New Products 11	Customer Relations 6	Supplier Relations 4	Success Probability 4	Weighted Total Score
Project A	4 — 44	3 — 18	4 — 16	6 — 24	102
Project B	2 — 22	3 — 18	6 — 24	6 — 24	88
Project C	2 — 22	5 — 30	4 — 16	3 — 12	80
Project D	1 — 11	2 — 12	5 — 20	1 — 4	47

Design of Experiments

Factor	Factor Name	Level 1 Low(-)	Level 2 High(+)	
A	Pan Shape	Round	Square	Two Factor Experiment
B	Cups of Flour	2	3	
AB	Pan Shape X Cups of Flour			
C	Temperature	325	375	Three Factor Experiment
AC	Pan Shape X Temperature			
BC	Cups of Flour X Temperature			
ABC	Pan Shape X Cups of Flour X Temperature			
D	Time	30	45	Four Factor Experiment
AD	Pan Shape X Time			
BD	Cups of Flour X Time			
CD	Temperature X Time			
ABD	Pan Shape X Cups of Flour X Time			
ACD	Pan Shape X Temperature X Time			
BCD	Cups of Flour X Temperature X Time			
ABCD	Pan Shape X Cups of Flour X Temperature X Time			

Create Input Table

Fractional Factorial
ABCD-
ABCD+

Design	Factors														
Trial	A	B	AB	C	AC	BC	ABC	D	AD	BD	ABD	CD	ACD	BCD	ABCD
1	-	-	+	-	+	+	-	-	+	+	-	+	-	-	+	1.1
2	+	-	-	-	-	+	+	-	-	+	+	+	+	-	-	3.7
3	-	+	-	-	+	-	+	-	+	-	+	+	-	+	-	4.2
4	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+	3.5
5	-	-	+	+	-	-	+	-	+	+	-	-	+	+	-	5.7
6	+	-	-	+	+	-	-	-	-	+	+	-	-	+	+	5.1
7	-	+	-	+	-	+	-	-	+	-	+	-	+	-	+	6.8
8	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-	6.3
9	-	-	+	-	+	+	-	+	-	-	+	-	+	+	-	6.4
10	+	-	-	-	-	+	+	+	+	-	-	-	-	+	+	6.7
11	-	+	-	-	+	-	+	+	-	+	-	-	+	-	+	6.5
12	+	+	+	-	-	-	-	+	+	+	+	-	-	-	-	6.4
13	-	-	+	+	-	-	+	+	-	-	+	+	-	-	+	1.3
14	+	-	-	+	+	-	-	+	+	-	-	+	+	-	-	2.9
15	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	3.5
16	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	3

Control Phase

Objective	Control the improved process and future process performance.

Key Deliverables

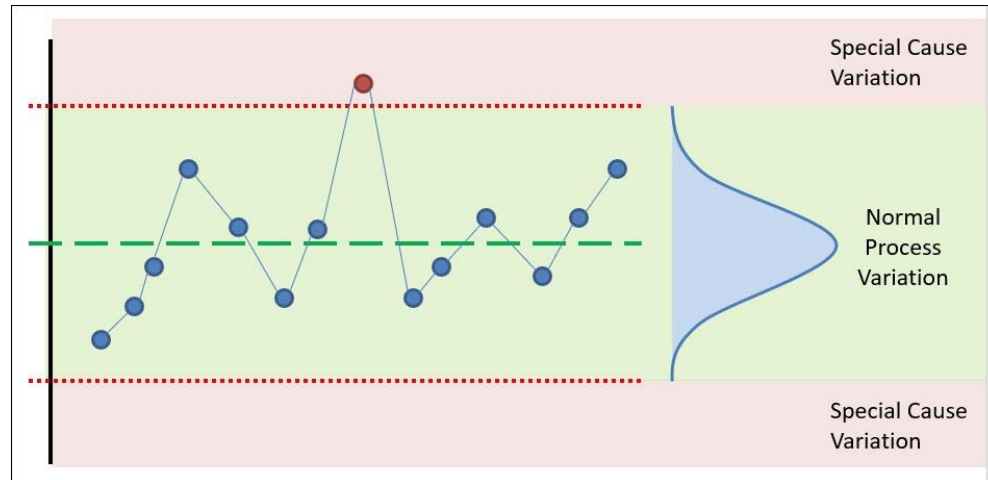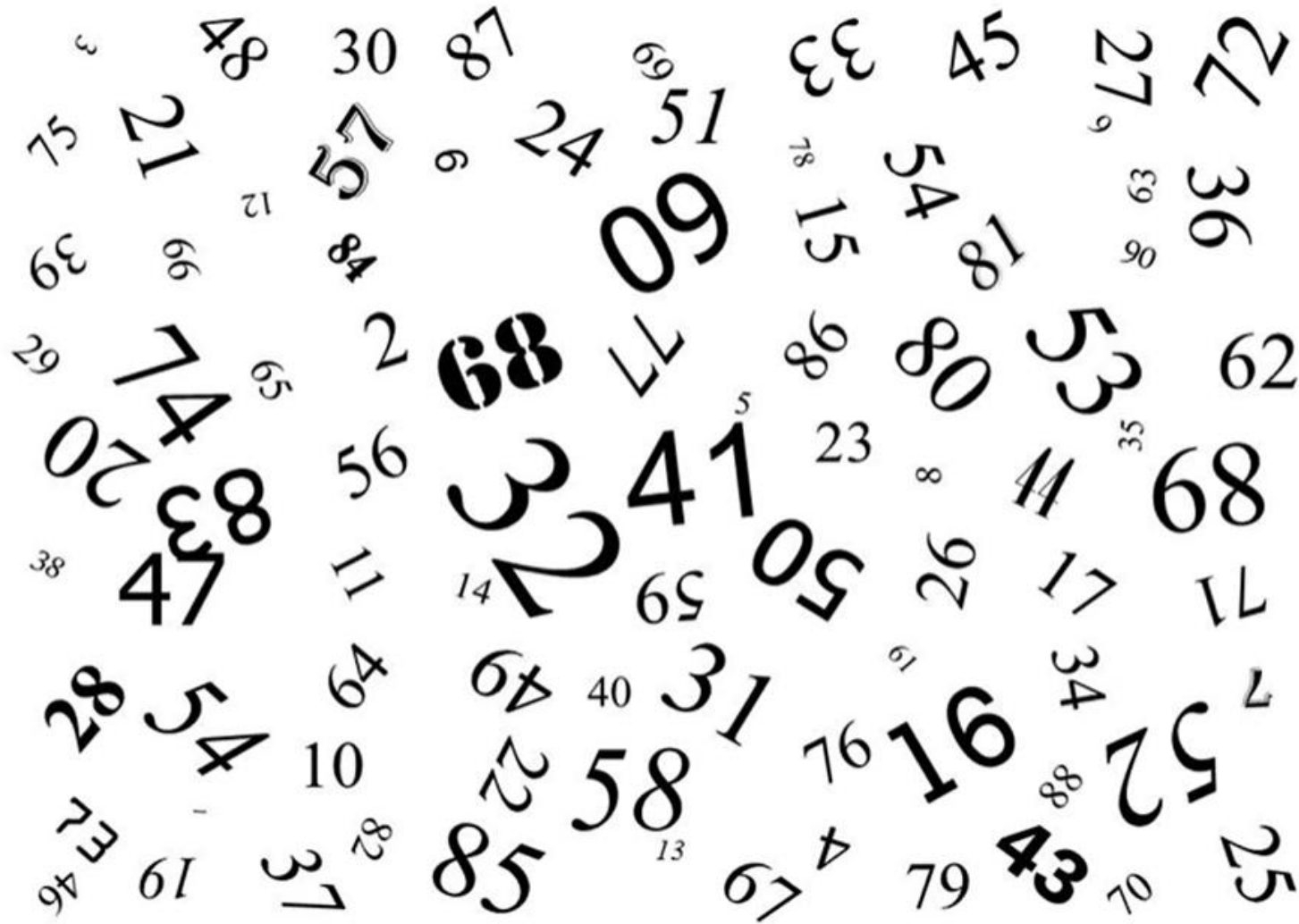| Quality control plan	Quality control plan to document what is needed to keep an improved process at its current level.
SPC	Statistical process control (SPC) for monitoring process behavior.
Poka-yoke	Mistake proofing (poka-yoke) to make errors impossible or immediately detectable.

Control Phase – Key Tools
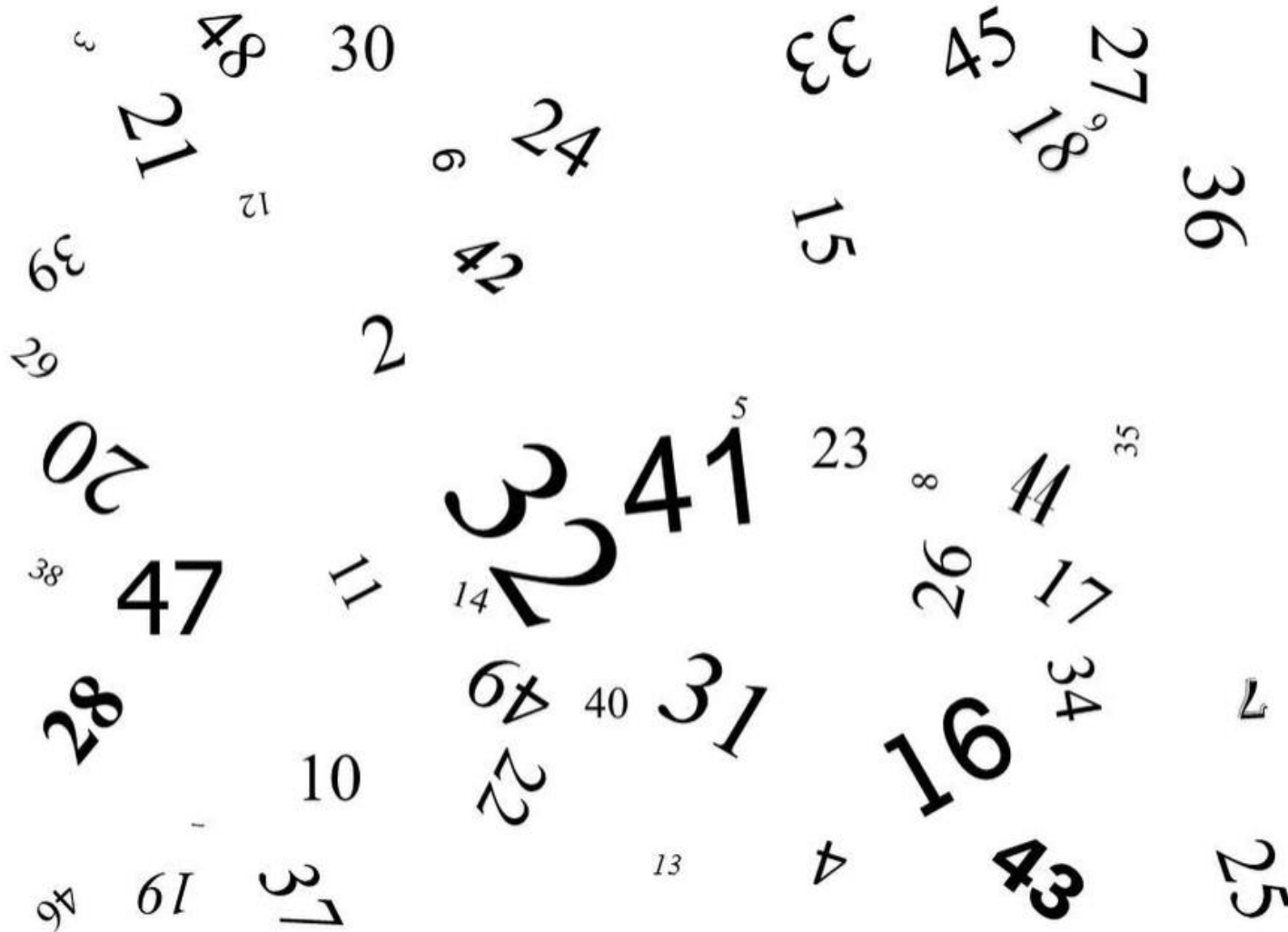
SPC Charts

Quality Control Plan

Six Sigma Toolbox

- Analysis of Variance (ANOVA)

- Box Plots

- Brainstorming

- Cause-effect Diagrams

- Correlation & Regression

- Design Of Experiments

- Graphs and Charts

- Histograms

- Hypothesis Testing

- Pareto Analysis

- Process Capability Studies

- Process Control Plans

- Process Flow Diagrams

- Quality Function Deployment

- Response Surface Methods

- Scatter Diagrams

- Standard Operating Procedures (SOPs)

- Statistical Process Control

Numbers from 1 to 49

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
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31	32	33	34	35	36	37	38	39	40
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Lean Six Sigma Development Stages

White Belt · Yellow Belt · Green Belt · Black Belt · Master Black belt · Six Sigma Champion
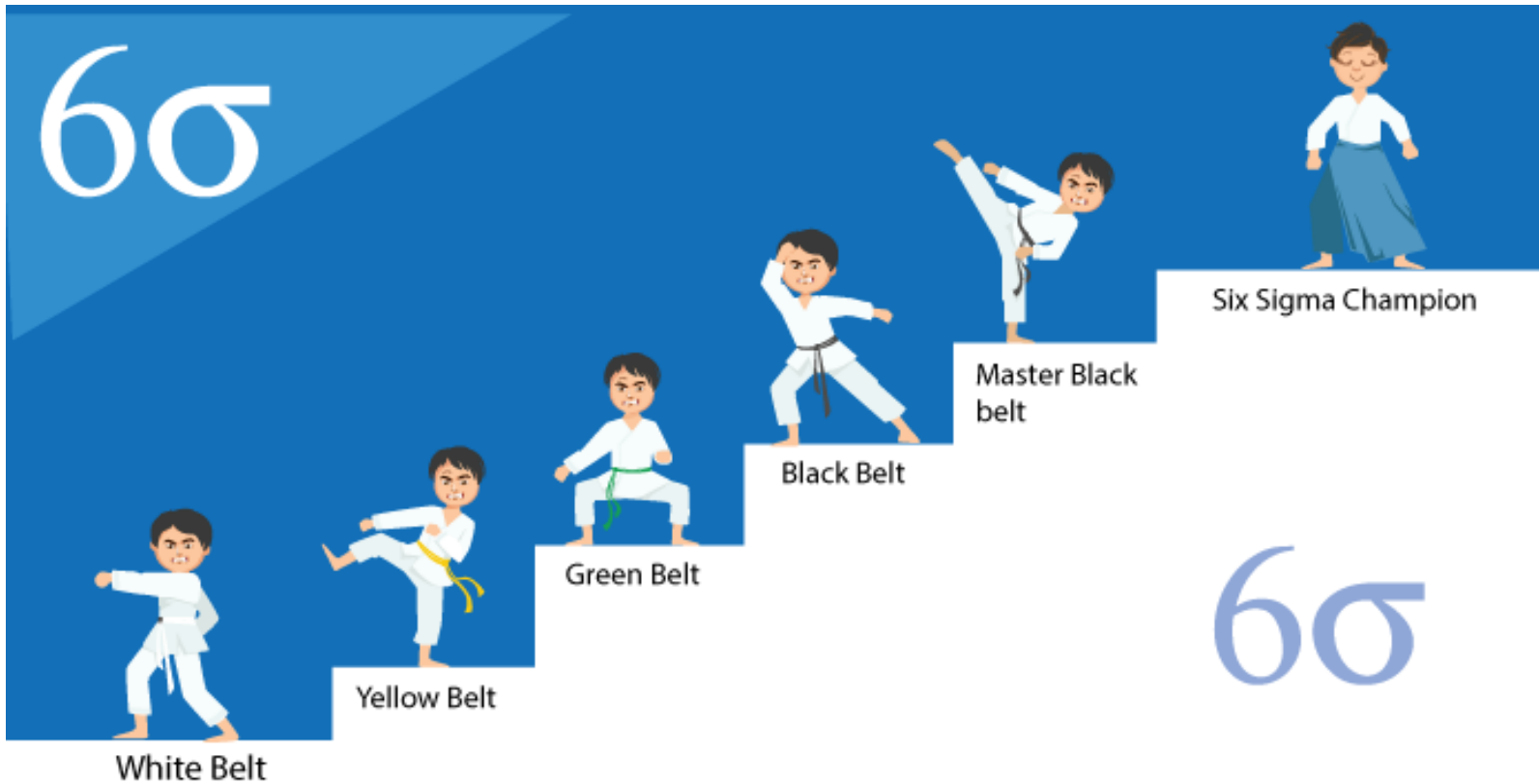
Lean Six Sigma Certification Program

Participants are required to complete the course, pass the Black Belt exam (ASQ) and complete two complex projects worth > AED 500K in total

Participants are required to complete the 3-day course, pass the Green Belt exam (ASQ) and complete one or two projects worth > AED 100K in total

Participants are required to complete the 3-day course, pass the Yellow Belt exam (internal) and complete one or two projects worth > AED 50K in total

Motivate interest and understanding of Lean Six Sigma across the organization

How to identify Projects

Plan	Analyze your current operations	Identify what can be improved	Brainstorm with Line Manager & LSS team
Deploy	Establish metrics with targets	Develop project charter	LSS council approval
Review & report	Launch projects	Monitor & report progress	Recommend improvements
Grow	Continuously improve		