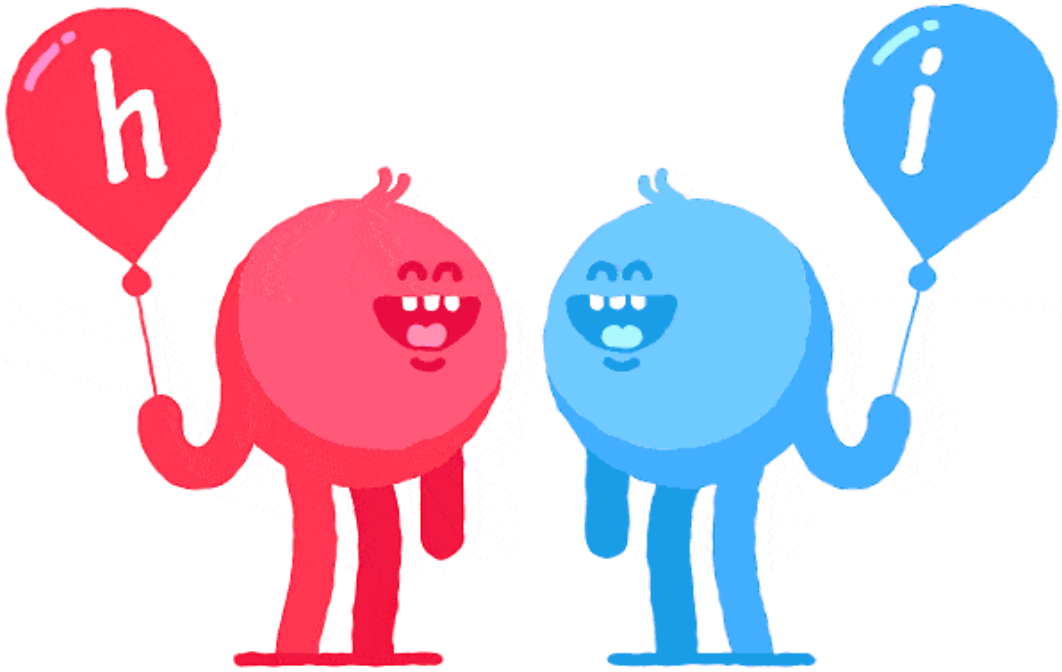
Implementing Quality Tools In Patient Safety

Introduce Yourself



Agenda

Introduction To Quality

Quality In Patient Safety

What Is Six Sigma?

DMAIC Methodology And Its Tools

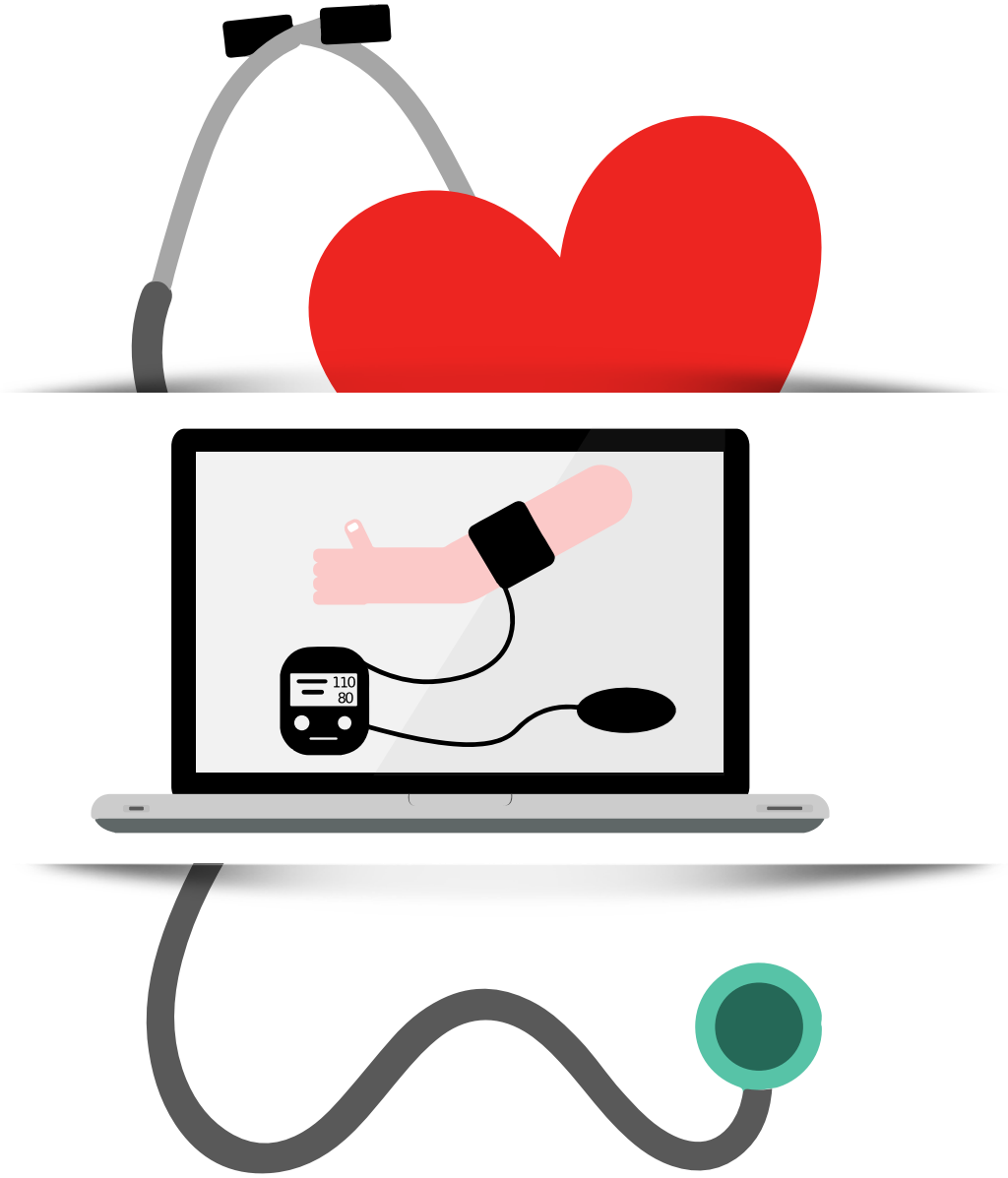
Define Phase

Measure Phase

Analysis

Improve

Control

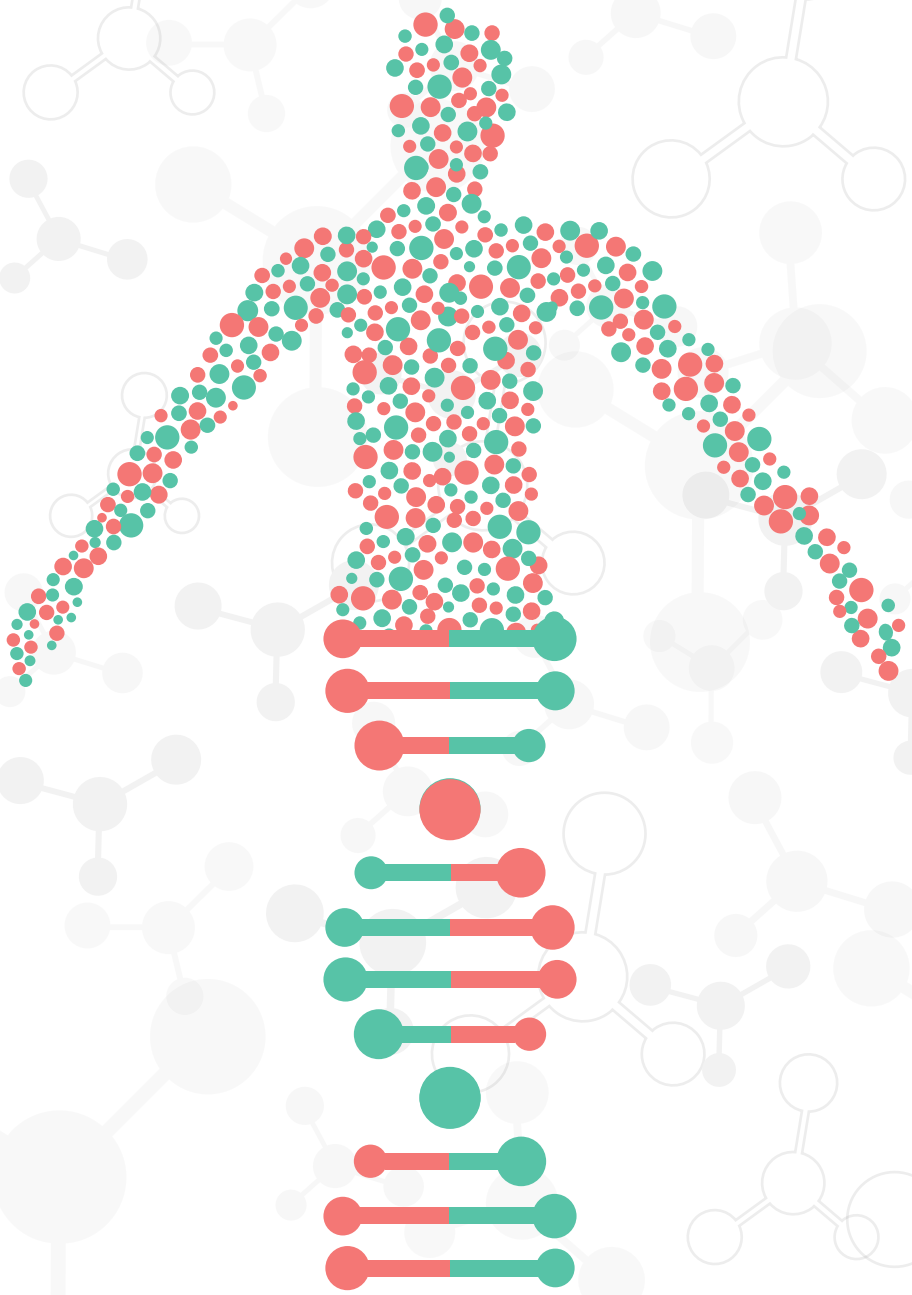


Patient Safety And Quality Culture

The notation of “quality culture” in healthcare has been always linked to “patient safety”.

Patient safety is a basic biological and physiological need in the foundation of healthcare delivery systems.

Ensuring patient safety, in very complex system such as healthcare organizations requires a massive ongoing and dedicated efforts of every member of the healthcare team.



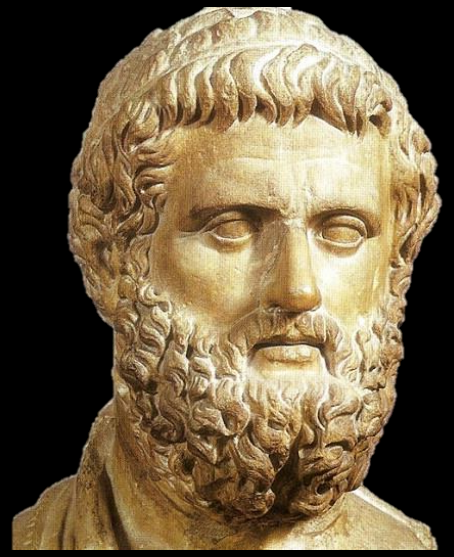
Lets Discuss …

From your experience :

- Define medical errors?
- Whom you think are the victims?

Definitions

- “The failure of a planned action to be completed as intended (i.e., error of execution) or the use of a wrong plan to achieve an aim (i.e., error of planning: IOM)
- The failure to complete the intended action as planned or the use of a wrong plan to achieve an objective, which can be system related failures or human related errors.
- The consequences of medical errors is not limited to patient only, healthcare professionals and organizations where errors occur both can be negatively impacted as well.



“All men make mistakes, but a good man yields when he knows his course is wrong, and repairs the evil. The only crime is pride

’V Sophocles, Antigone

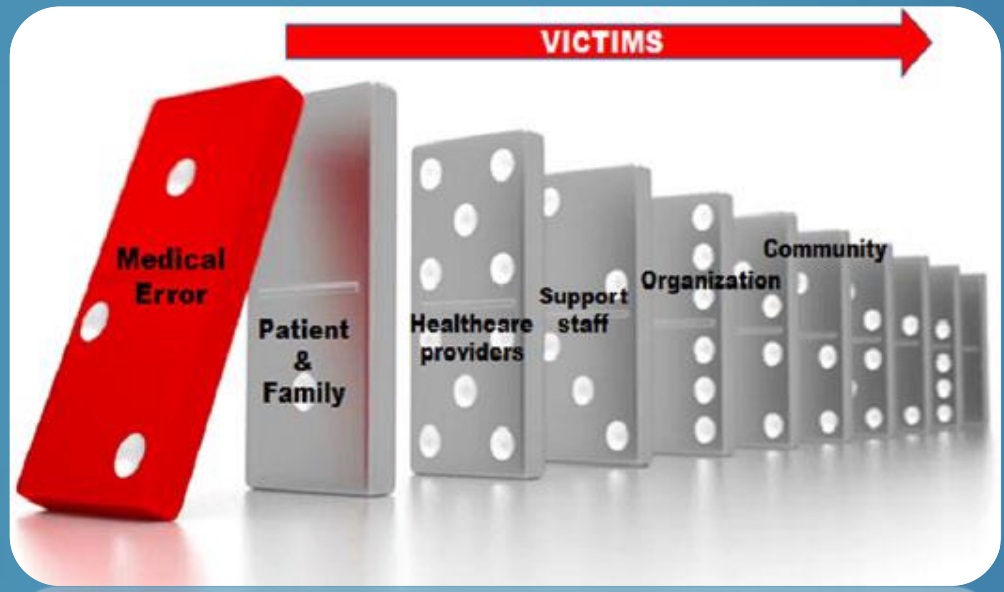
Readings...

- Despite the huge attention on patient safety, in 2013 in particular, James performed a literature review of studies that used medical records to identify adverse events and it resulted that the number of early deaths associated with preventable errors to patients unfortunately increased to be more than 400,000 annually, and the occurrence of serious harm appeared to be 10 to 20 times more common than death

- James, J.T., 2013. A new, evidence-based estimate of patient harms associated with hospital care. Journal of patient safety, 9(3), pp.122-128. s daily.(cited 1323)

The Domino Effect of Medical Errors

- Samer Ellahham, M.D., 2018. The Domino Effect of Medical Errors. American Journal of Medical Quality, 1, p.2.



Problem Classification

Six Sigma	**Conformance problems are defined by unsatisfactory performance that causes customer dissatisfaction.**
Lean tools	**Efficiency problems result from unsatisfactory performance from the standpoint of stakeholders other than customers.**
Creative thinking	**Unstructured performance problems result from unsatisfactory performance in processes that are not well-specified or understood.**
Special tools	**Product design problems involve designing new products or redesigning existing products to better satisfy customer needs.**
Combined approaches	**Process design problems involve designing new processes or substantially revising existing processes.**

EXAMPLE 1

WHY SIX SIGMA IN HEALTH CARE

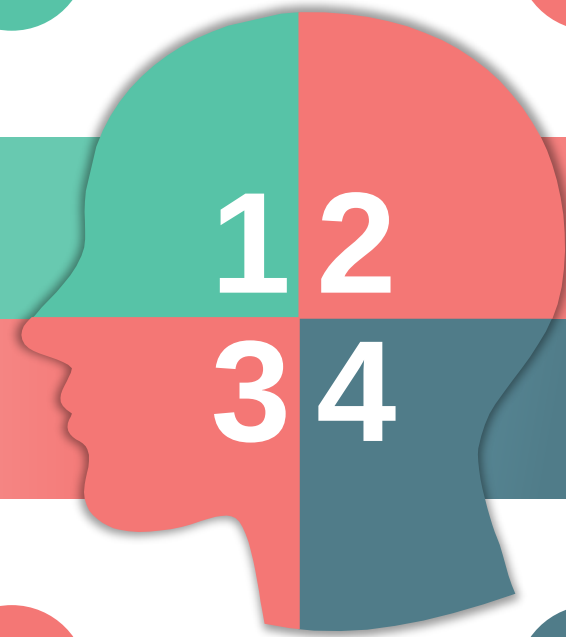
Application Of Lean Six Sigma Methodology In The Registration Process Of A Hospital In India

48 percent reduction in percentage of scheduled utilization of staff for the process.

48% Reduction

A 91 percent reduction in queue length

91% Reduction



3 to 1.5 and 61 to 21.20

Cycle time of the process was reduced from 3 to 1.5 minutes and the SD was reduced to 21.2 from 61 seconds.

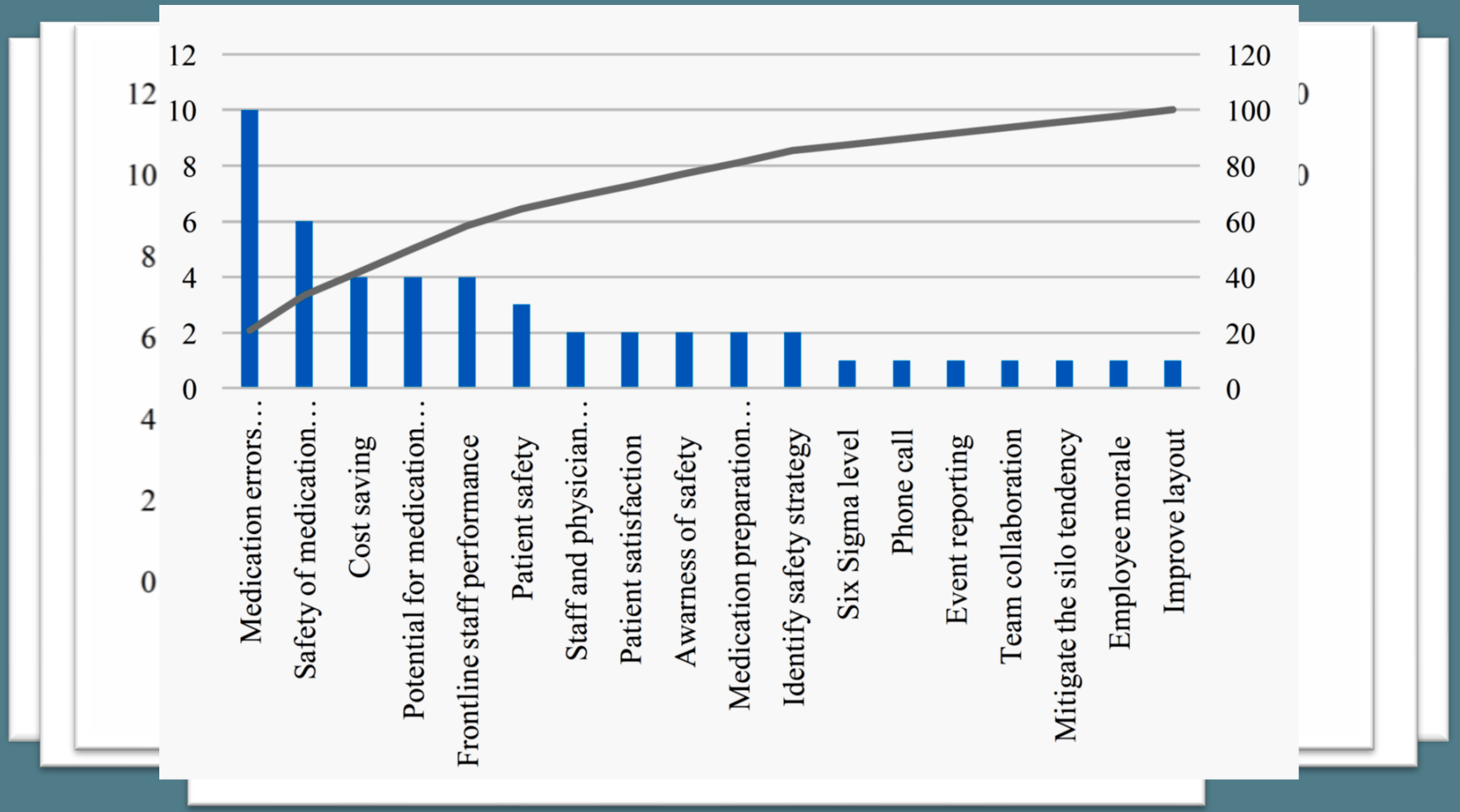
94% Reduction

The project has shown a 94 per cent reduction in patients' average waiting time.

EXAMPLE 2

WHY SIX SIGMA IN HEALTH CARE

- Reducing medication errors using LSS Methodology: A systematic
- literature review and key findings (2018)

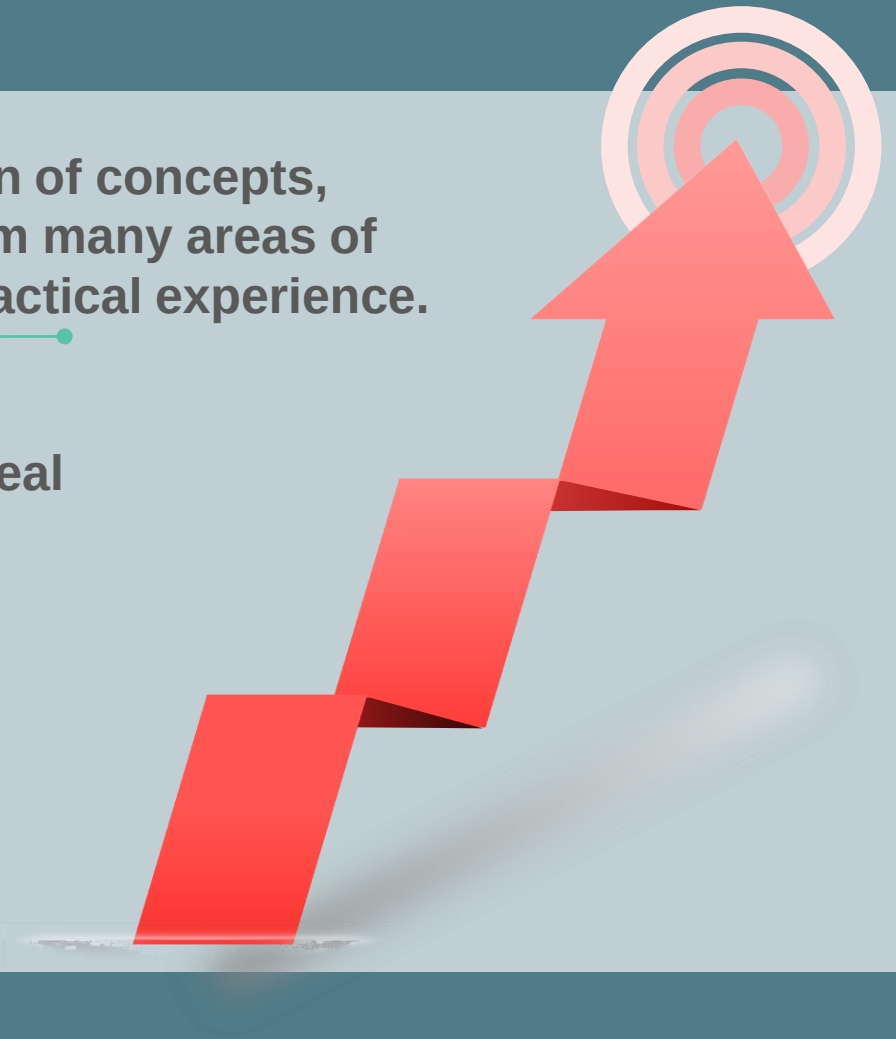


What Is Six Sigma?

Six Sigma encompasses a vast collection of concepts, tools, and techniques that are drawn from many areas of business, statistics, engineering, and practical experience.

Many of these subjects are technical; others deal with management and organizational issues.

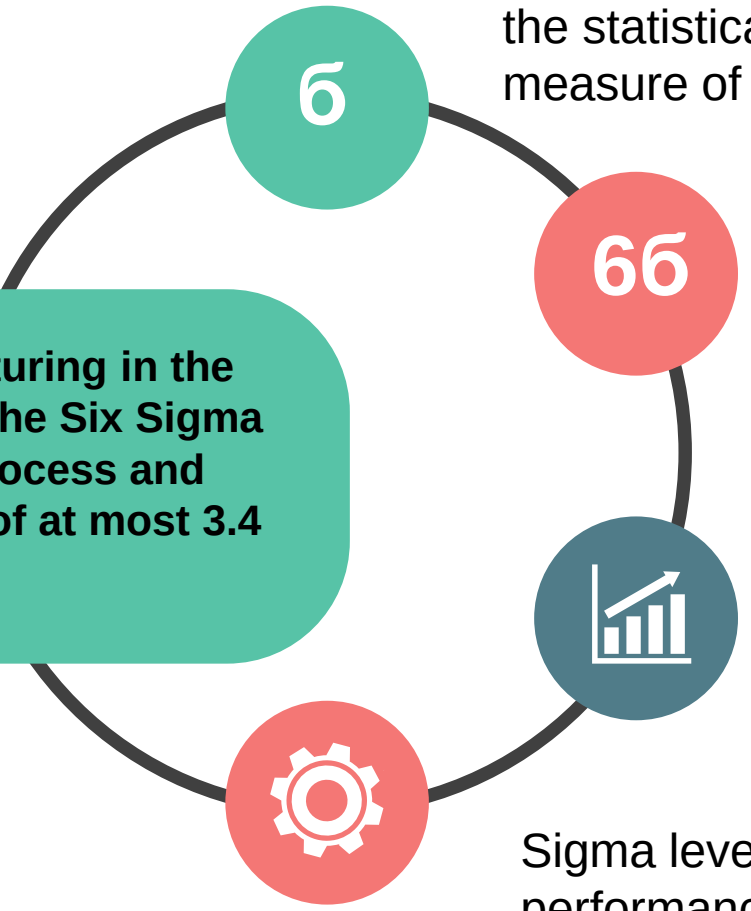
Practitioners need a balanced set of both the “hard” and the “soft” disciplines in order to apply and implement Six Sigma effectively.



MEANING OF SIX SIGMA

Six Sigma Terminology

- **Although originally developed for manufacturing in the context of tolerance-based specifications, the Six Sigma concept has been operationalized to any process and has come to signify a generic quality level of at most 3.4 defects per million opportunities.**



Sigma (σ) is a Greek letter used in the statistical world to represent a measure of variability.

Six Sigma is a business strategy to change company culture with top management support.

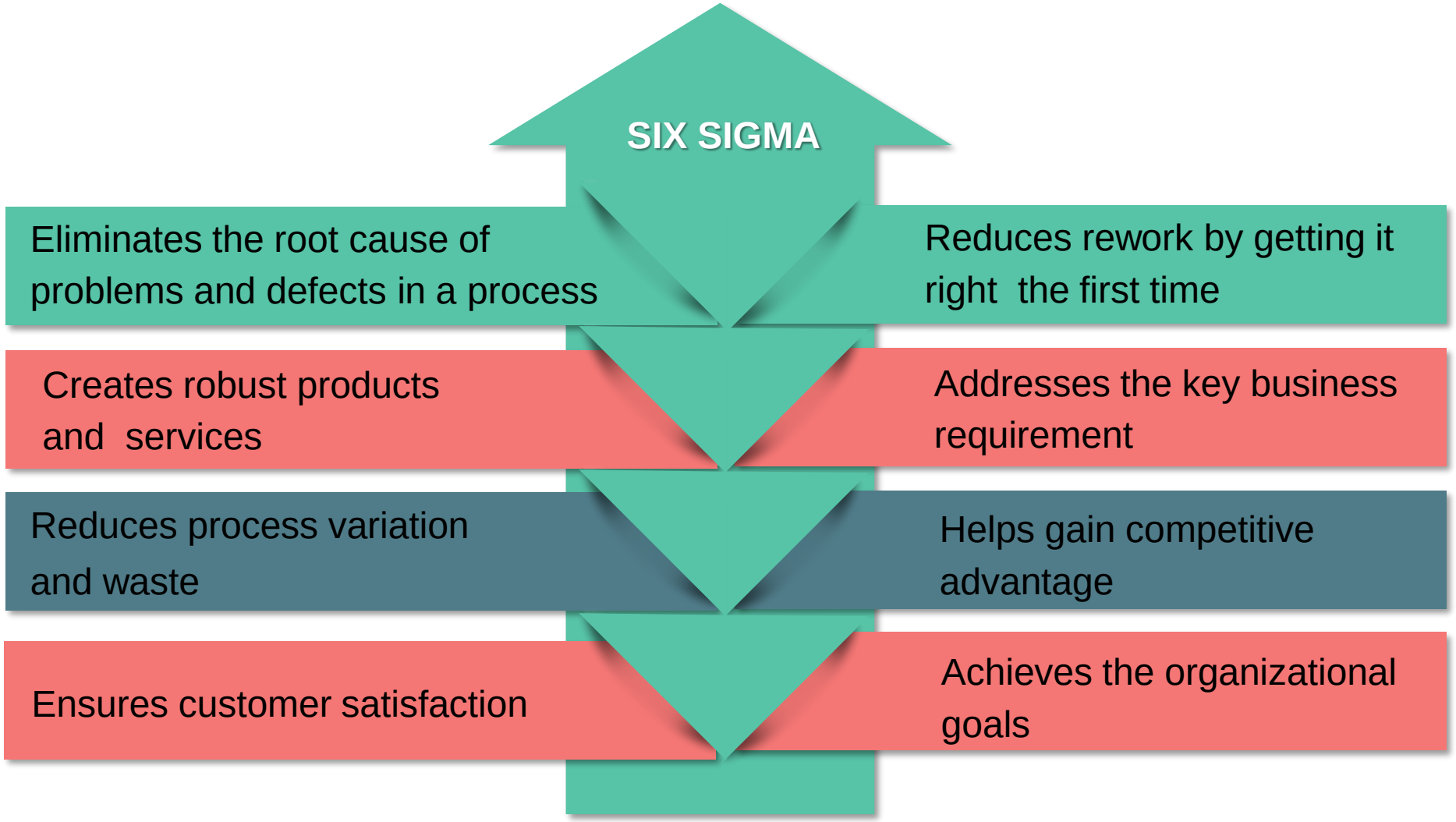
The Six Sigma process is an improvement method of quality principles and techniques.

Sigma level is a measure of performance for a business processes or service.

PURPOSE OF SIX SIGMA

- Increase customer satisfaction
- Improve Shareholder value
- Improve the process

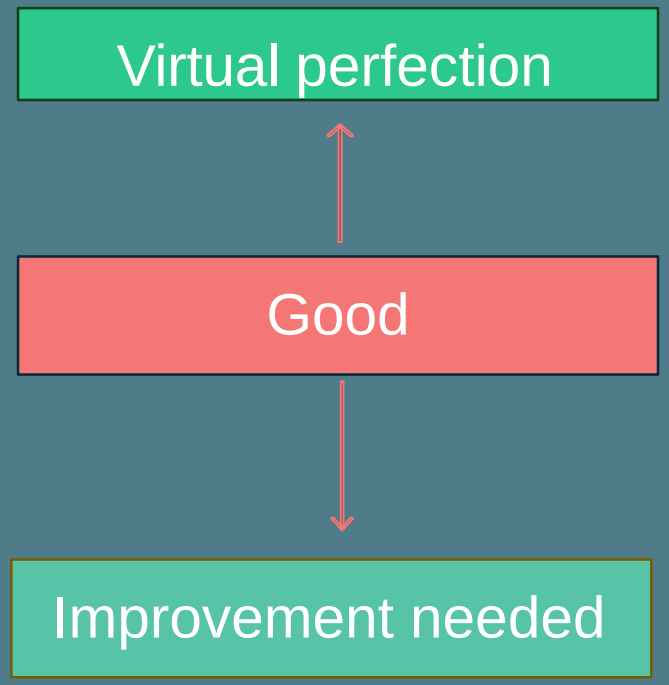
BENEFITS OF SIX SIGMA



SIGMA CONVERSION TABLE

INDICATORS ON THE SIX SIGMA LEVELS

- The Six Sigma Level is a measure of performance for a business process or service



Sigma Level	DPMO	Yield/Accuracy (%)
6	3.4	99.99966%
5	230	99.977%
4	6,210	99.38%
3	66,800	93.32%
2	308,000	69.15%
1	690,000	30.85%

99.9 %?

- **99.9%** means we have **0.1** defect every **100** actions
- **4000** wrong medical prescriptions each year
- This translates to **1** defect every **1000** actions
- More than 3000 newborns accidentally falling from the hands of nurses or doctors each year

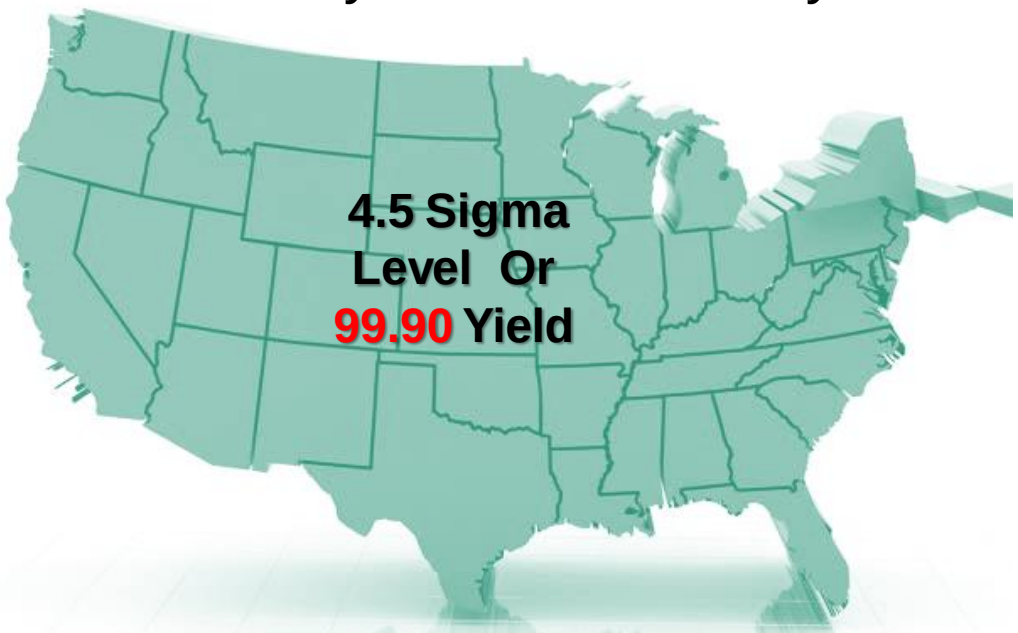
• QUALITY MEASURES AND REAL WORLD IMPACT

- What would be the consequence in the **U.S.** if a quality goal of 4.5 Sigma Level or 99.90% yield is accepted?

1 hour of unsafe drinking water every month

50 new born babies dropped at birth by doctors each day

500 incorrect surgical operations each week



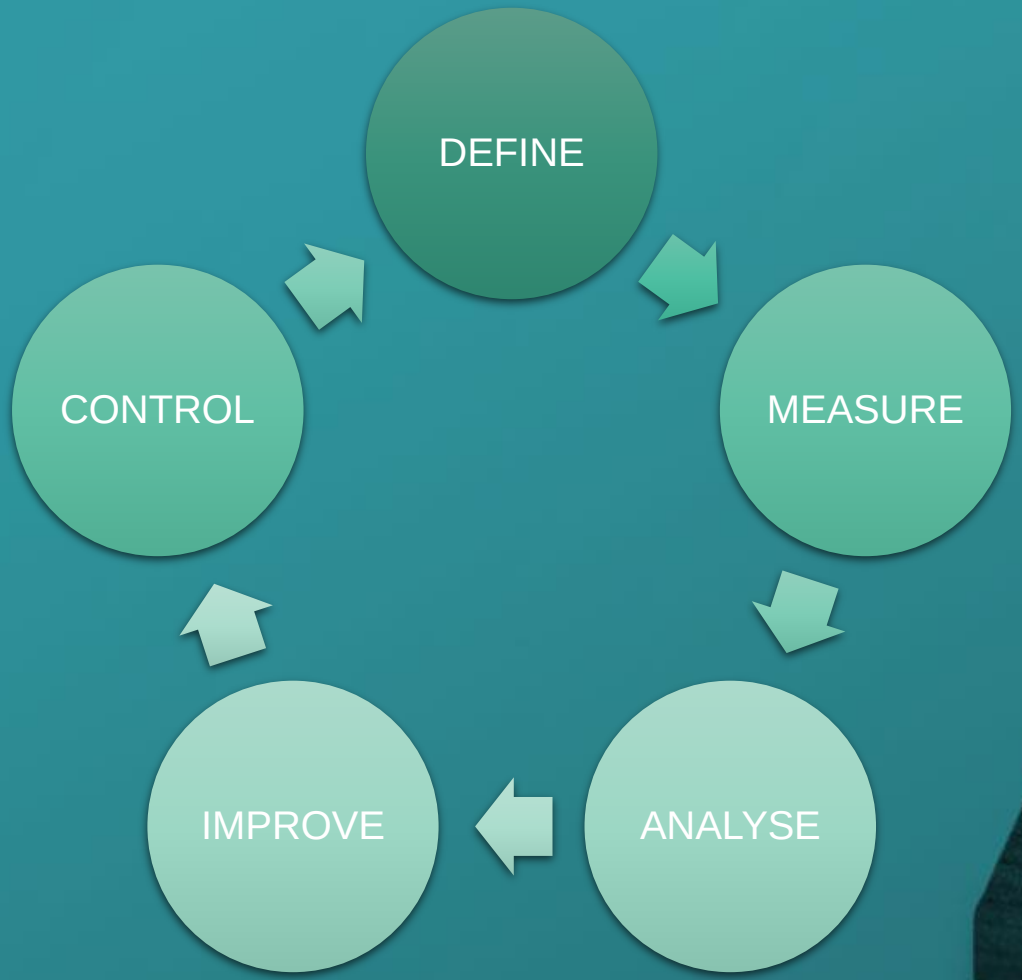
16,000 pieces of mail lost by the U.S. postal service every hour

22,000 checks deducted from the wrong bank accounts each hour

32,000 missed heartbeats per person, per year

2 unsafe plane landings per day at O'Hare International Airport in Chicago

DMAIC Methodology



DMAIC Methodology

- SIPOC
- Voice of Customer (VOC)
- Critical to Quality (CTQ)
- Quality Function Deployment (QFD)
- Failure Modes and Effects Analysis (FMEA)
- Cause and Effect (C&E)

- Measurement System Analysis (MSA)
- Control charts
- Process mapping
- Normality plots

- Simple linear regression (SLR)
- Pareto charts
- Fishbone diagram
- Failure Modes and Effects Analysis (FMEA)
- Multi-vari charts
- Hypothesis testing

- Brainstorming
- Piloting
- Failure Modes and Effects Analysis (FMEA)
- Design of Experiments (DOE)

- Control charts
- Control plan
- Measurement System Analysis (MSA)

Six Sigma In Healthcare Services

All Six Sigma projects have three key characteristics:

- Aa problem to be solved,
- A process in which the problem exists,
- One or more measures that quantify the gap to be closed,
- Can be used to monitor progress.

Key Performance Measures

- Cost
- Cycle time
- Accuracy
- Customer satisfaction

Process Concepts

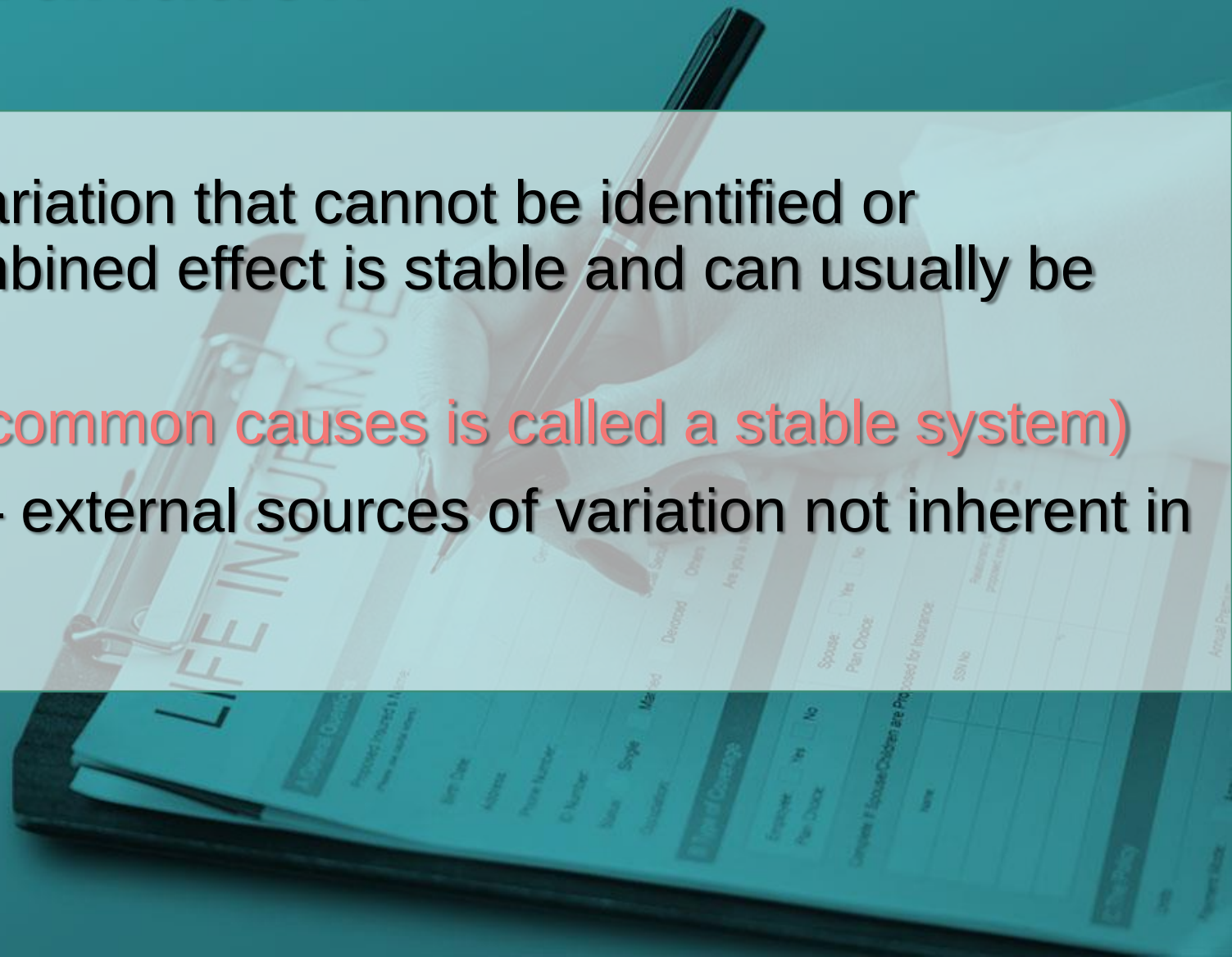
- Process owners - Individuals or groups who are accountable for process performance and have the authority to control and improve their process.
- Stakeholders – Who are or might be affected by an organization's actions and success: customers, the workforce, partners, collaborators, governing boards, stockholders, donors, suppliers, taxpayers, regulatory bodies, policy makers, funders, and local and professional communities.

Types of Process Variation

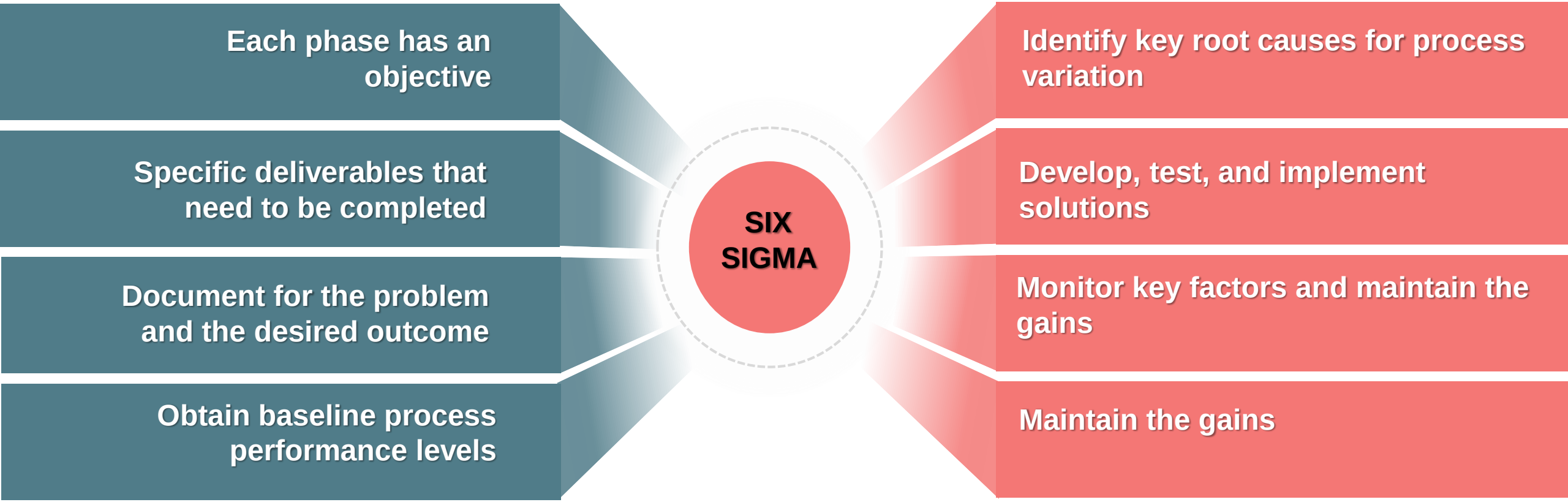
- Common causes - random variation that cannot be identified or explained. However, their combined effect is stable and can usually be predicted statistically.

  (A system governed only by common causes is called a stable system)

- Special (assignable) causes – external sources of variation not inherent in a process.



SIX SIGMA PROJECT



SIX SIGMA PROJECT

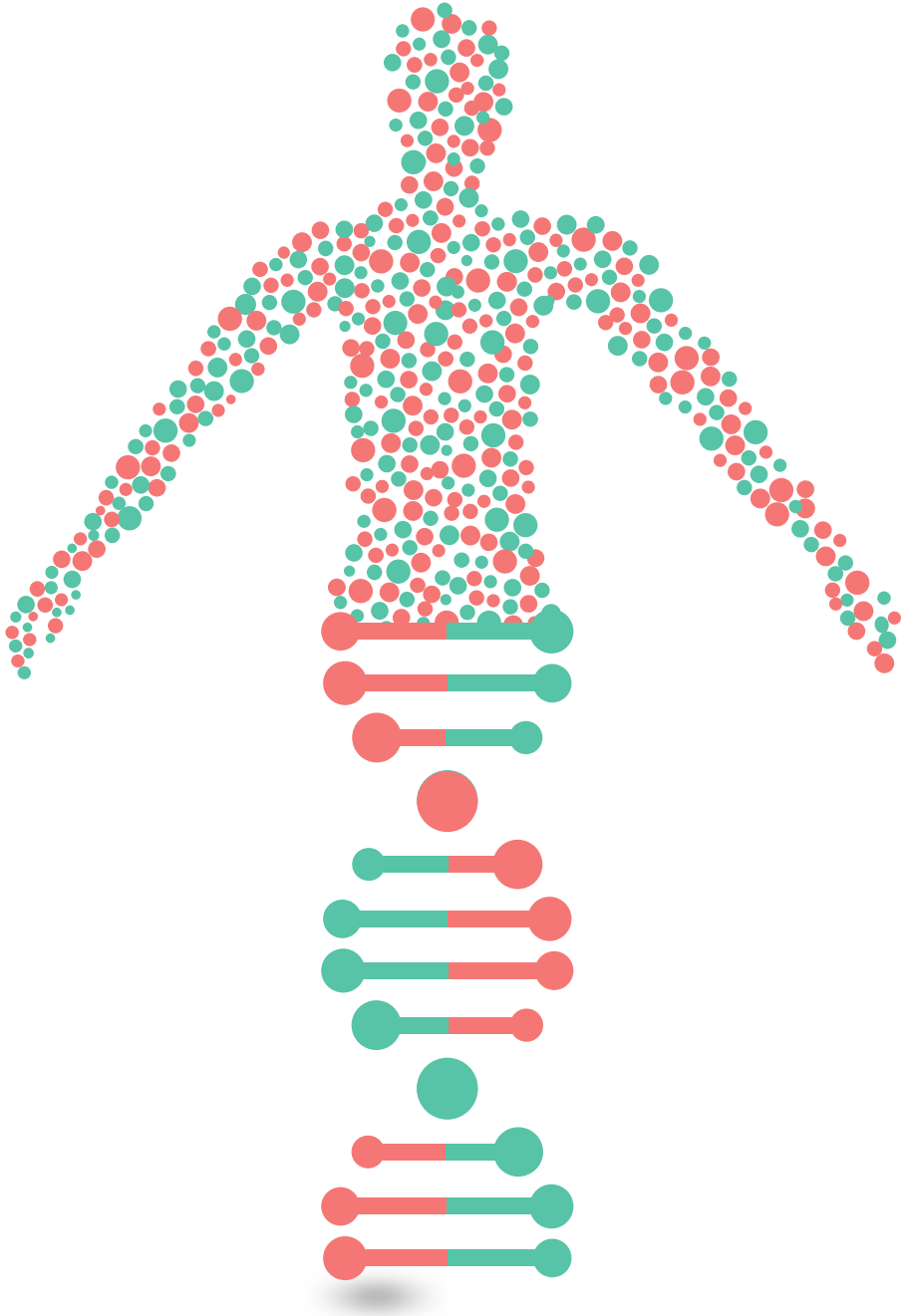
- Each phase has an objective
- Specific deliverables that need to be completed
- Document for the problem and the desired outcome
- Obtain baseline process performance levels
- Identify key root causes for process variation
- Develop, test, and implement solutions
- Monitor key factors and maintain the gains

Based on what ,we select the project (process)?

Lets discuses

Define Phase

- Project Selection
- Voice Of The Customer
- Project Management
- Team Dynamics



Define Phase

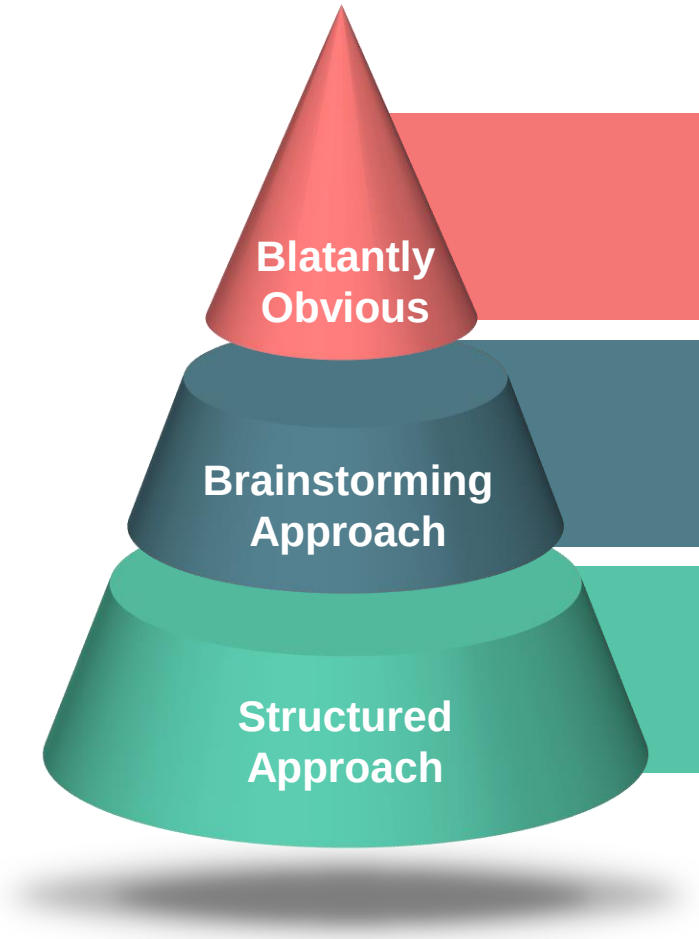
Project Identification

It is important to know if a project should be considered a Six Sigma project:

- Is there an existing process?
- Is there a problem in the process? Is the problem measurable?
- Does the problem impact customer satisfaction?
- Does working on the problem impact profits of the company? Is the root cause of the problem unknown?
- Is the solution unknown?

Define Phase

Project Selection



Things that clearly occur on a repetitive basis and present problems

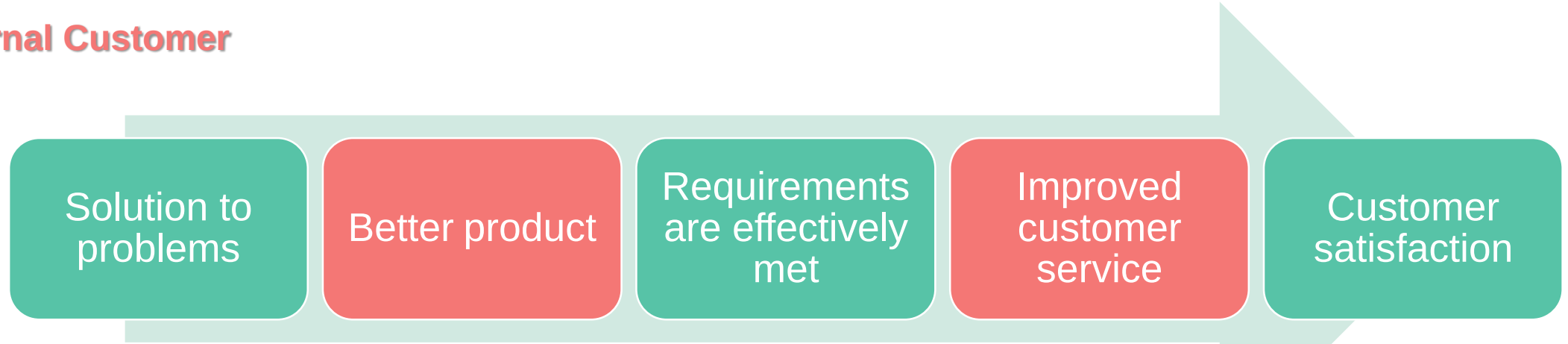
Identifies projects based on individual's "experience"

Identifies projects based on organizational data (Best)

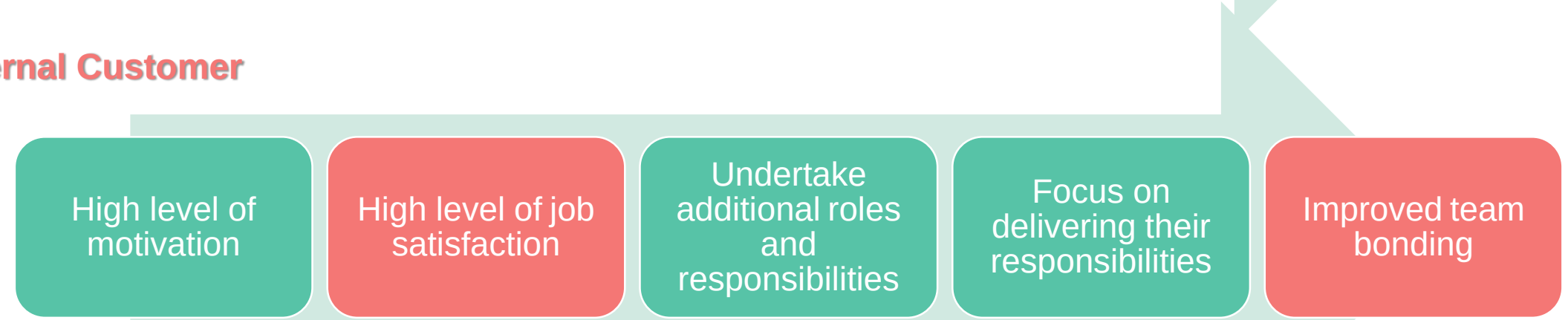
Define Phase

Voice of Customer

External Customer



Internal Customer



Define Phase

VOC DATA COLLECTION

WHY

- Purpose Of Data
- Collection Exercise

WHAT

- VOC Method
- Information Required
- Method of Analysis

WHEN

- Date
- Time
- Frequency

WHERE

- Which Customers?
- Location

HOW

- Data Collection Method
- Description

WHO

- Team Members And Their Responsibilities

Define Phase

Exercise

How we collect the data ?

Define Phase

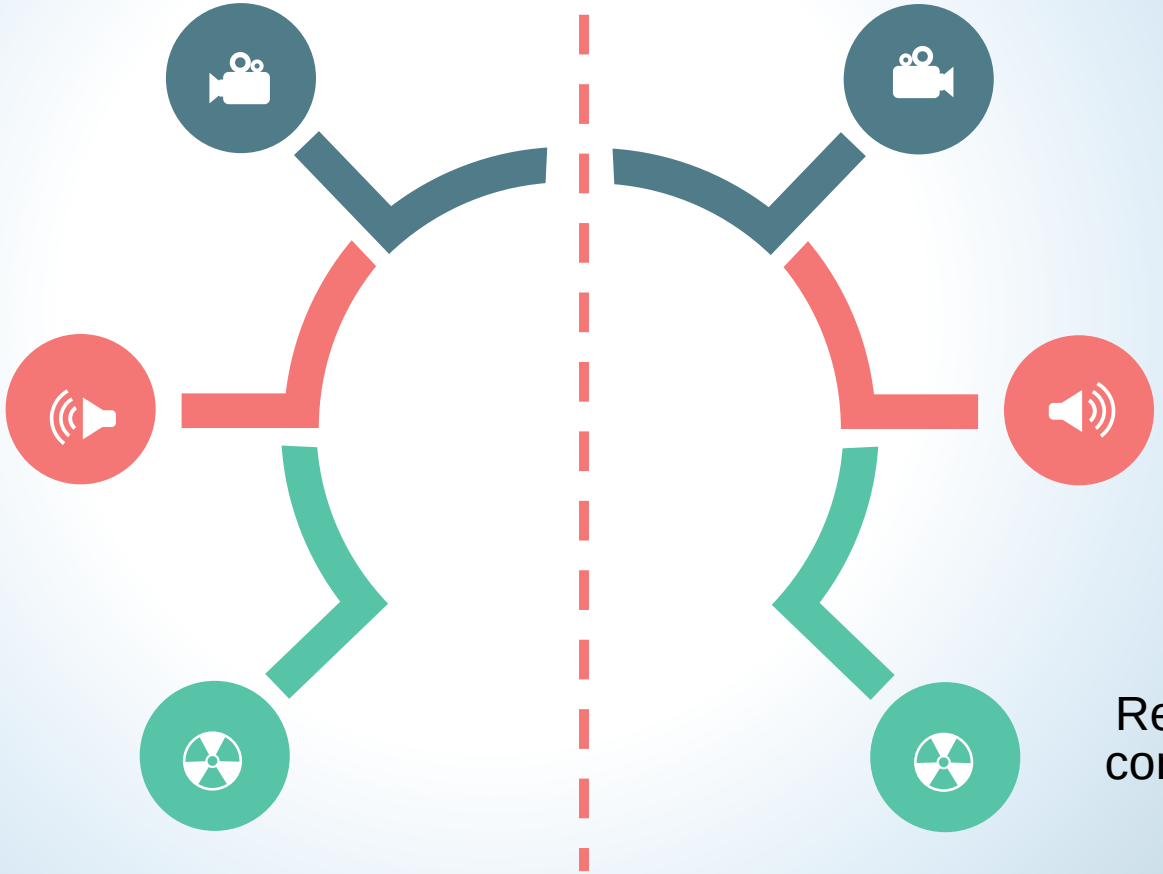
DATA COLLECTION METHODS

Reactive Data Sources

Warranty claims, product returns, customer complaints

Information comes whether action is taken or not

Used to address immediate needs of customers



Proactive Data Sources

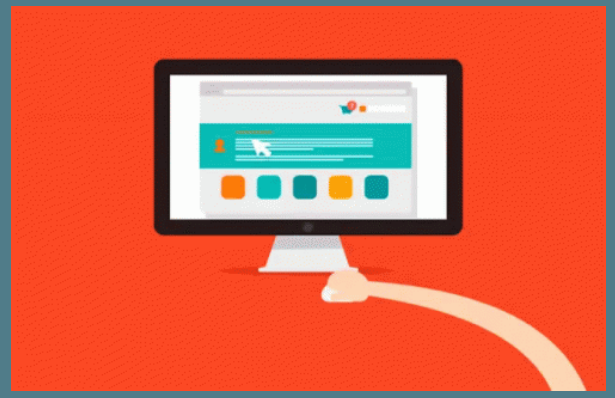
Questionnaires, focus groups, and interviews

Information is gathered from the customer after contact is initiated

Requires targeted customer contact to obtain information related to the project

Define Phase

PROACTIVE DATA SOURCE - QUESTIONNAIRE



WEB SURVEY

Survey	
Specific	General

Cost	
Low	High

Clarification	
Bad	Good

Open-Ended	
NO	Yes

Number of Respondents	
Less	More

Data quality	
Bad	Good

Analysis Time	
Less	More

TELEPHONE SURVEY

PROACTIVE DATA SOURCE

Focus Group

Advantages Of A Focus Group:

Interaction generates information

Provides in-depth responses

Addresses more complex questions or qualitative data

Gets critical-to-quality definitions

Define Phase

PROACTIVE DATA SOURCE

Interview

- **Interview is a technique of questioning and probing an individual to gather information.**
- **It is informal.**
- **It encourages the interviewees to voice their opinion.**
- **Individual interviews can be time consuming.**

Define Phase

VOC TABLE

SAMPLE ANALYSIS OF VOC – AC PURCHASE

Who is the customer	What the customer said (VOC)	What the customer meant				
		What is the need?	When is the need felt?	Where is the need felt?	Why is the need felt?	How is the situation handled now?
Office Rep	AC should be silent	Quiet work environment	During the work day	In the office	To focus on work	Uses a ceiling fan that makes a lot of noise
	AC should be efficient	Good cooling	During the work day	In the office	Weather is very hot in May and June	Uses a ceiling fan that is not so effective in summer
	AC should be economic	Affordability	N/A	N/A	Limited finances	N/A

Define Phase

CRITICAL-TO-QUALITY (CTQ) TREE

CTQ TREE EXAMPLE

- **A CTQ tree is used to visually show the relationship between the VOC needs, Drivers, Requirements, and CTQ.**

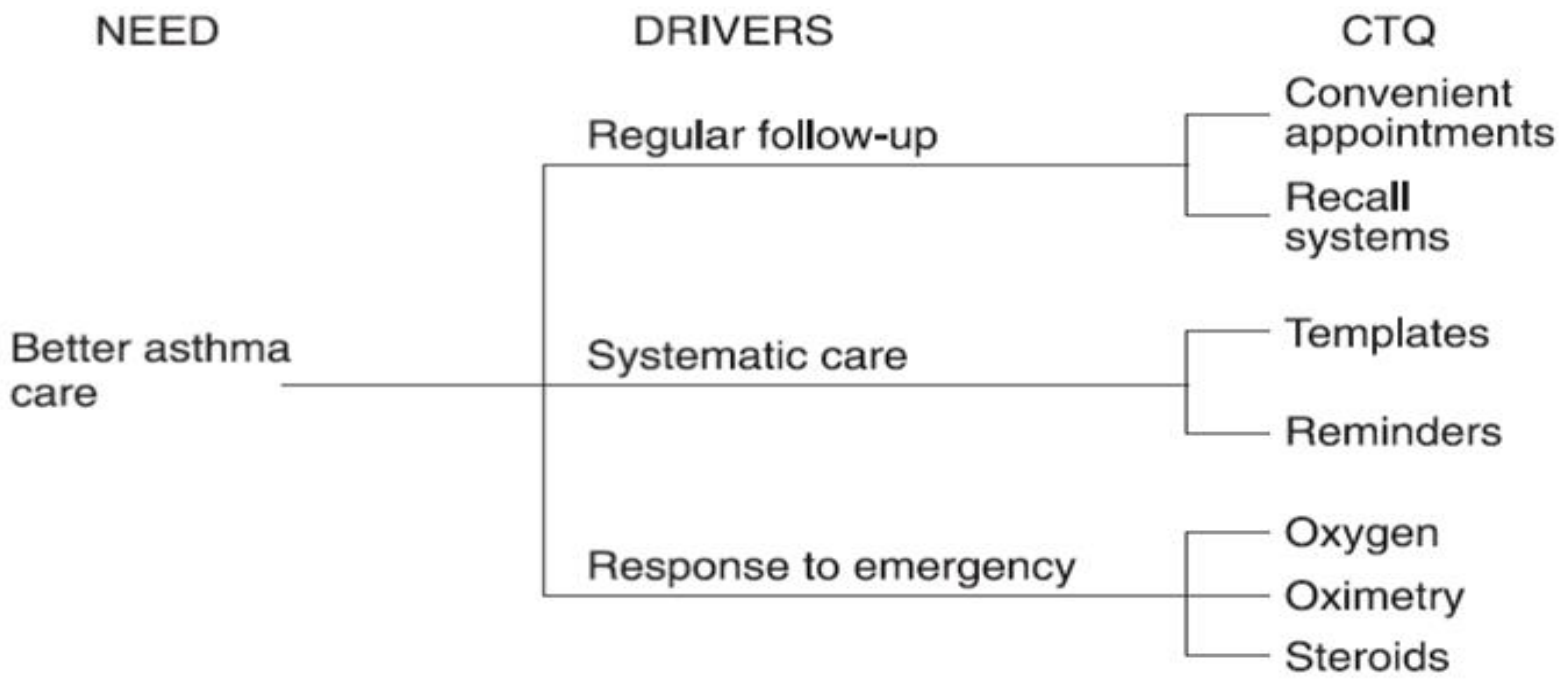


Figure 5 Critical to quality (CTQ) tree

Six Sigma Project Charter Template

Product or Service Impacted		*Expected Project Savings ($)*	
Black Belt or Green Belt		*Business Unit*	
Champion		*Phone Number for Belt*	
Master Black Belt		*Email for Belt*	
Start Date		*Target Completion Date*	

Element	Description	Team Charter
1. Process:	The process in which opportunity exists.	
2. Project Description: what is the "Practical Problem"	Problem and goal statement (project's purpose)	
3. Objective:	What improvement is targeted and what will be the impact on Rolled Throughput Yield (RTY), Cost of Poor Quality (COPQ) and Capability index C-P, back orders, costs? The "Statistical Problem" - the measurable variable(s	
4. Business Cases:	Expected financial improvement, or other justification	
5. Team members:	Names and roles of team members?	
6. Project Scope:	Which part of the process will be investigated and excluded.	
7. Benefit to External Customers:	Who are the **final** customers, what are their key measures, and what benefits will they see?	
8. Schedule:	Give the key milestones/dates. M- Measurement A- Analysis I- Improvement C- Control Note: Schedule appropriate Safety Reviews.	
9. Support Required:	Will any special capabilities, hardware, trials, etc be needed?	

Project Y's	Baseline	GOAL	Entitlement	units
Metric 1				**%**
Metric 2				**$/A**
Metric 3				**units /A**

Project Start	
"M" Completion	
"A" Completion	
"I" Completion	
"C" Completion	
Safety Reviews	
Project Completion	

THE PROJECT CHARTER

SECTIONS IN A SIX SIGMA PROJECT CHARTER

- Project Name
- Project Description
- Problem statement
- Business Need
- Team Members
- Deliverables or Project Scope
- Stakeholder Requirements
- Project Timelines
- Project Constraints
- Summary Budget

Define Phase

THE PROJECT CHARTER

PROJECT SCOPE

PROJECT SCOPE STEPS

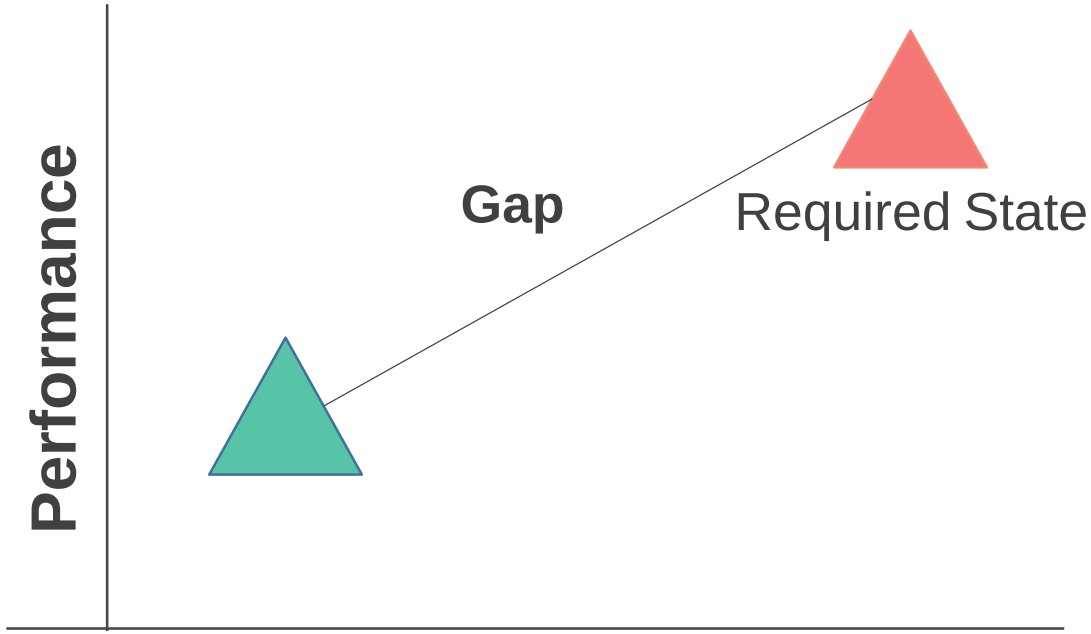
Scope Planning	1. Define, verify, and control project scope
Scope Definition	2. Review project charter
Work Breakdown Structure	3. Divide project into smaller tasks
Scope Verification	4. Receive scope acceptance from management
Scope Control	5. Control and manage change to scope

Define Phase

THE PROJECT CHARTER

THE PROBLEM STATEMENT

- States the problem clearly and concisely
- Identifies and specifies the observed gap in performance
- Is quantifiable with metrics



Tip: The problem statement cannot contain solutions or causes for the problem.

Define Phase

THE PROJECT CHARTER

THE PROBLEM STATEMENT

01

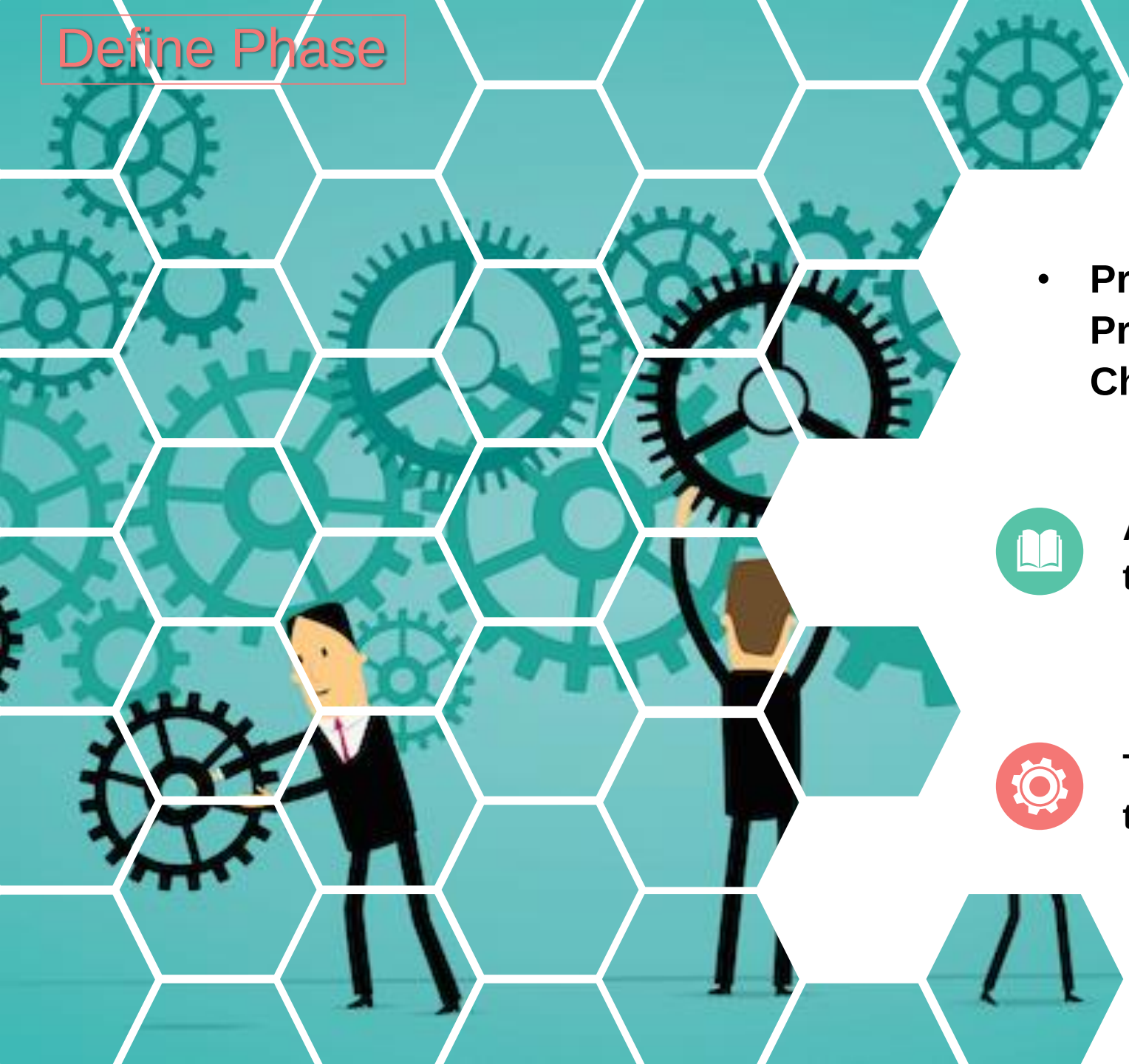
- **POOR Problem Statements:** Customers are complaining about waiting times in ED (Emergency Department).
- **GOOD Problem Statements:** Since August 1, 2006, the average time to wait in the ED is 1 hour - causing us to miss our goal of less than 30 minutes.. This causes customer complaints, and patients leaving without being seen

(Include the following: WHAT is wrong, WHERE and WHEN is it occurring, what is the BASELINE magnitude at which it is occurring and what is it COSTING me?)

02

- **POOR Objective Statements:** Improve cycle time in ED.
- **GOOD Objective Statements:** Reduce the cycle time for ED patients to less than 30 minutes, by May 2010. This will support our Customer Satisfaction goal and reduce the number of patients leaving without being seen.

(Include the following: Improve some METRIC from some BASELINE level to some GOAL, by some TIME FRAME, to achieve some BENEFIT and improve upon some CORPORATE GOAL or OBJECTIVE)



THE PROJECT CHARTER

THE PROJECT SCOPE

- **Project scope is interpreted from the Problem Statement and the Project Charter using a variety of tools.**

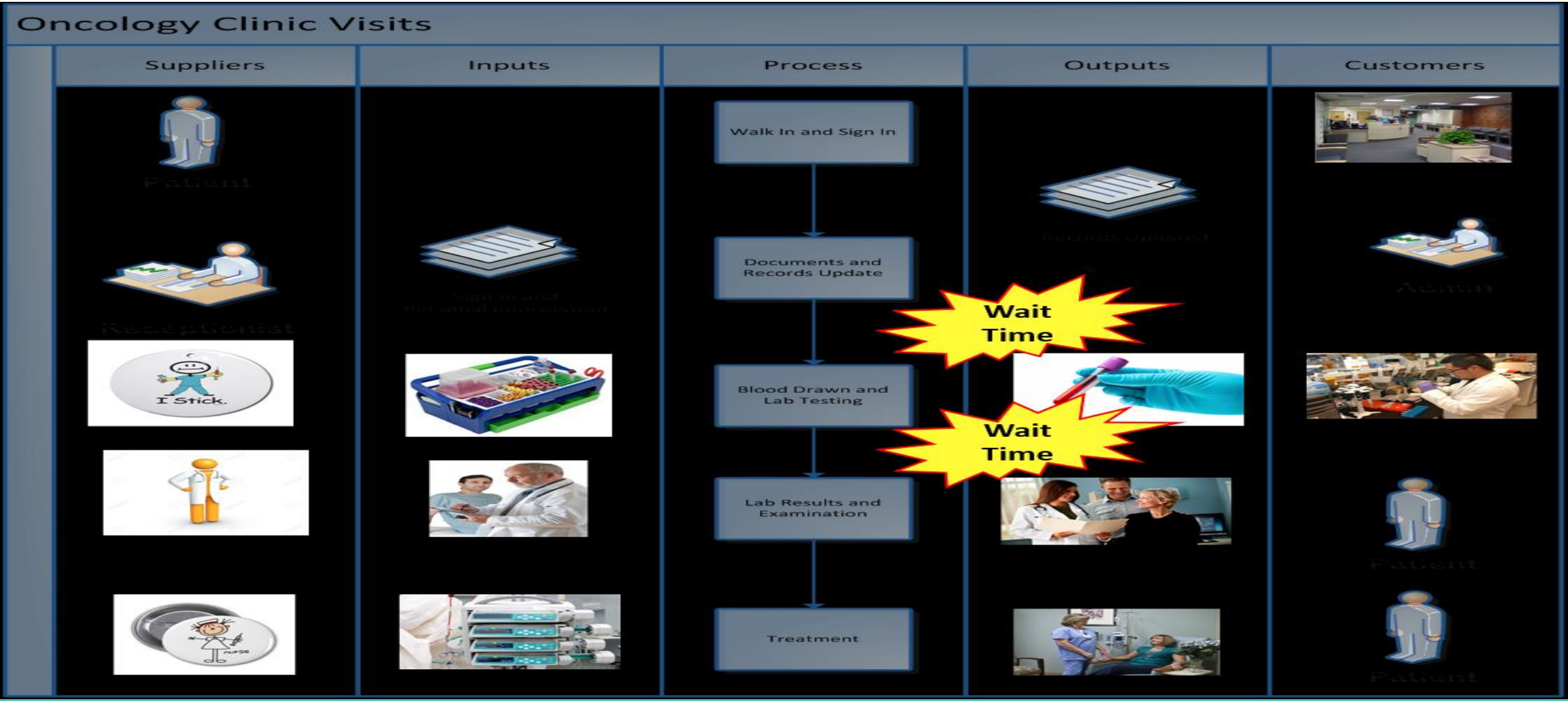
A Pareto chart helps identify the causes that have a major impact on the project

The SIPOC helps team members understand the process functions at different levels

Define Phase

THE PROJECT CHARTER

PROJECT SCOPE



Exercise ....


6σ
ANALYSE
IMPROVE
CONTROL
Kaizen
Manufacturing
Lean
6σ
Six Sigma
Process

Define Phase

Project Planning

Define Phase

SIX SIGMA ASSESSMENT METRICS

METRICS USED TO ASSESS THE PERFORMANCE OF An ORGANIZATION

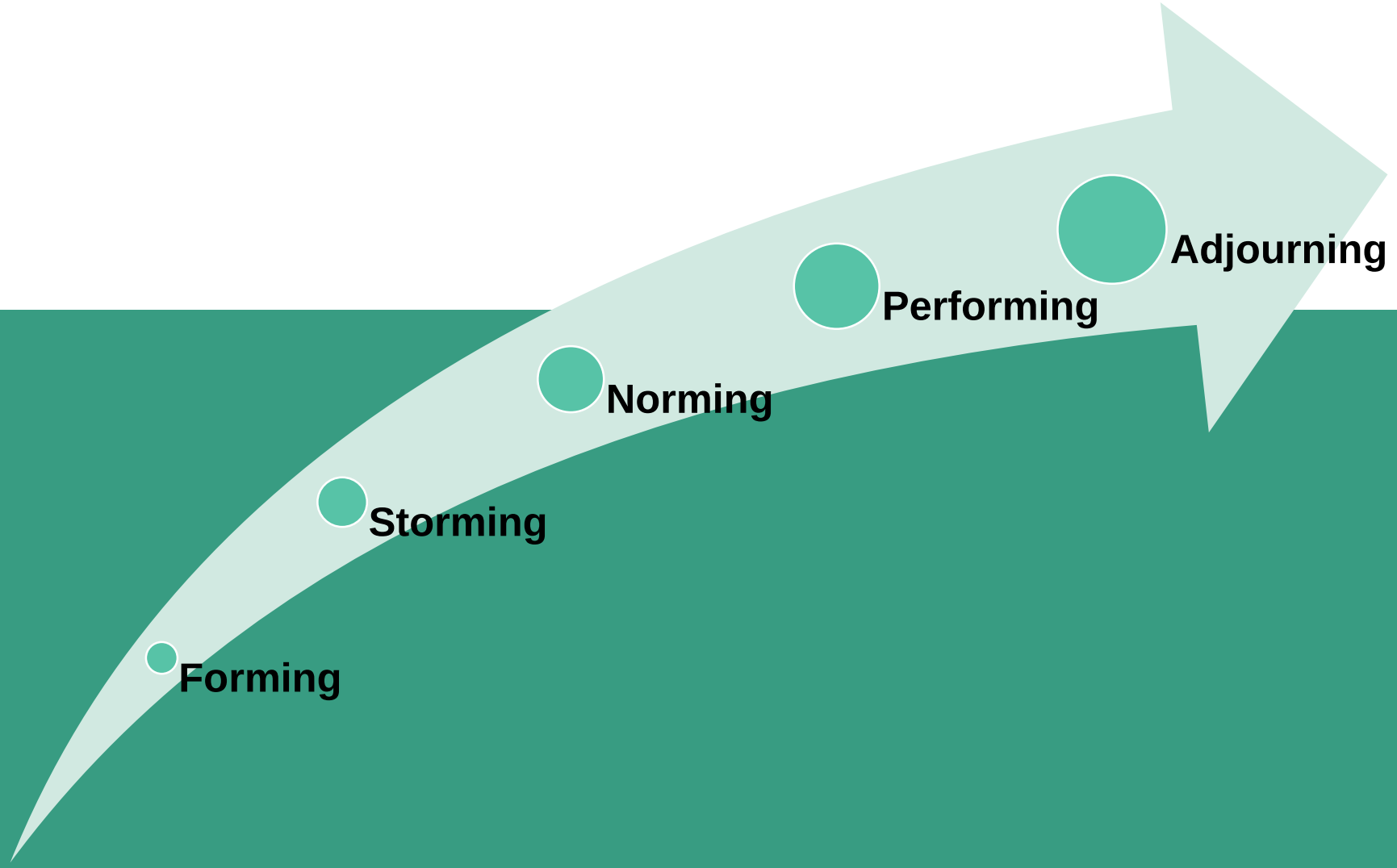
Six Sigma

- Defect Per Unit (DPU)
- Defect Per Million Opportunities (DPMO)
- Sigma Level
- Cost of Quality
- Process Capability (Cp)

Define Phase

Six Sigma Teams

The key to successful six sigma project is ……



STRUCTURE OF A SIX SIGMA TEAM

LEVELS IN A SIX SIGMA TEAM

Six Sigma Green Belts support the black belts by working on the project and performing day-to-day jobs.

Six Sigma Black Belts apply strategies to specific projects, and lead and direct teams to execute projects.

Six Sigma Master Black belts train and coach black belts, green belts, and various functional leaders of the organization.

Six Sigma Champions: Identify and scope projects, and develop strategy
Identify and coach master black belts

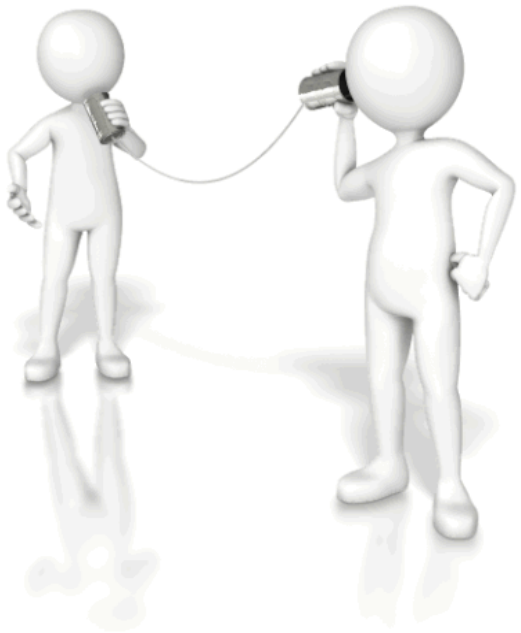
Top Executives:

- Lead change and provide direction
- Own the Six Sigma initiatives

SIX SIGMA TEAMS

COMMUNUCATION

Exercise ..



- List at least four modes of communication between team members.

- List the advantage and disadvantage of each mode:
  1. Meeting
  2. Memos
  3. Emails
  4. Newsletter
  5. Events

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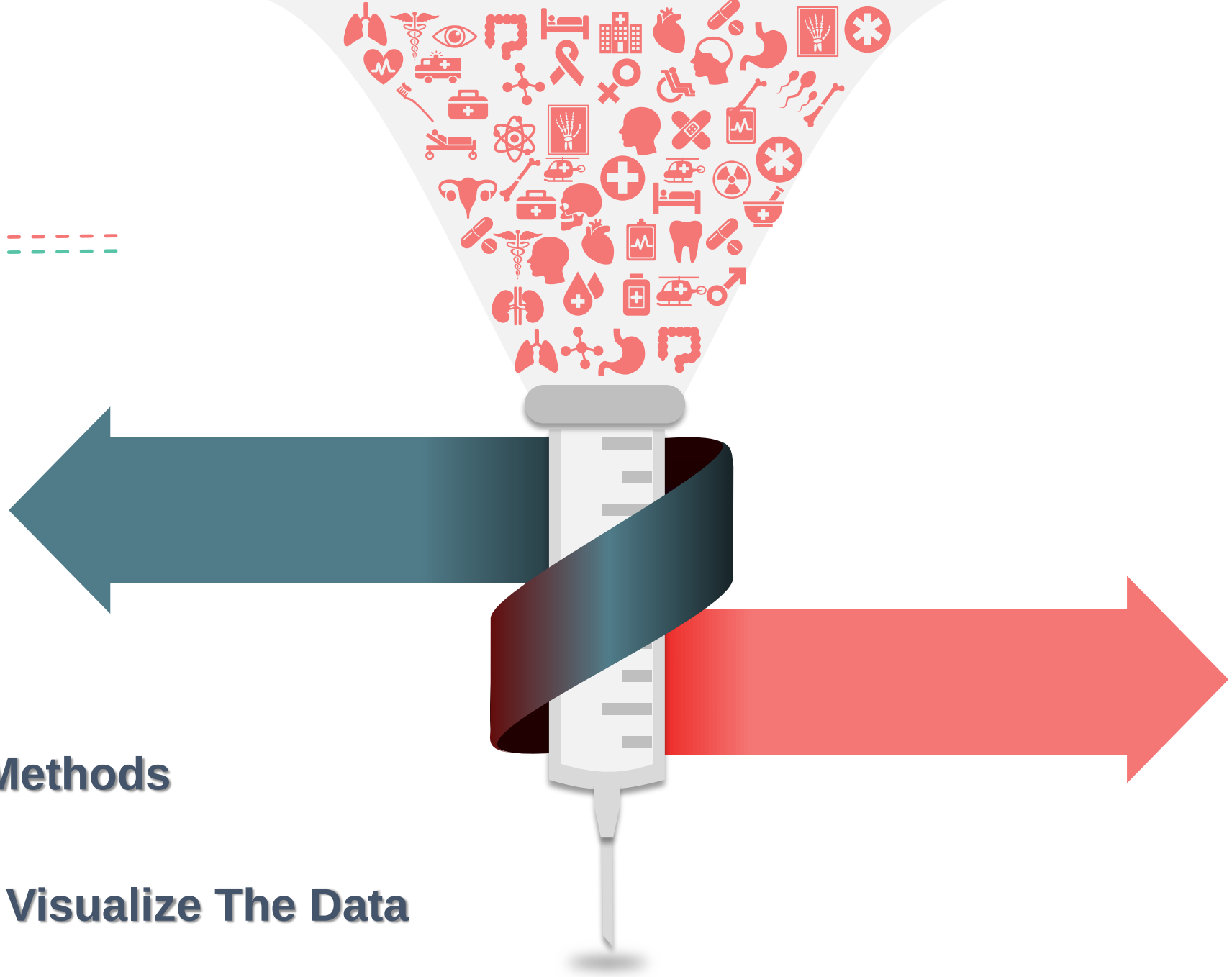
Communicate With Stakeholders

- Communicate the objective of the project
- Explain the adverse that effects the stakeholders

Measure



- Types Of Data
- Data Collection Methods
- Summarize And Visualize The Data

Measure …

- What type of data will we need to answer the question?
- Where can we find the data?
- Who can provide the data?
- How can we collect the data with minimum effort and with minimum chance of error?

Type of Data

- Attribute data
  (Discrete: countable)
- Variable data
  (Continuous: measured on a continuous scale)

Exercise

- Give me example from each category ?
- Separated Data?

(how many ? /what type /how often)

- Continuous scale?

(height /weight /time)

Measure Phase

Data Collection Plan

Step 1. Develop a data collection plan based on the process map and priority matrix.

Step 2. Develop the data collection tool and test it. Some typical components are:

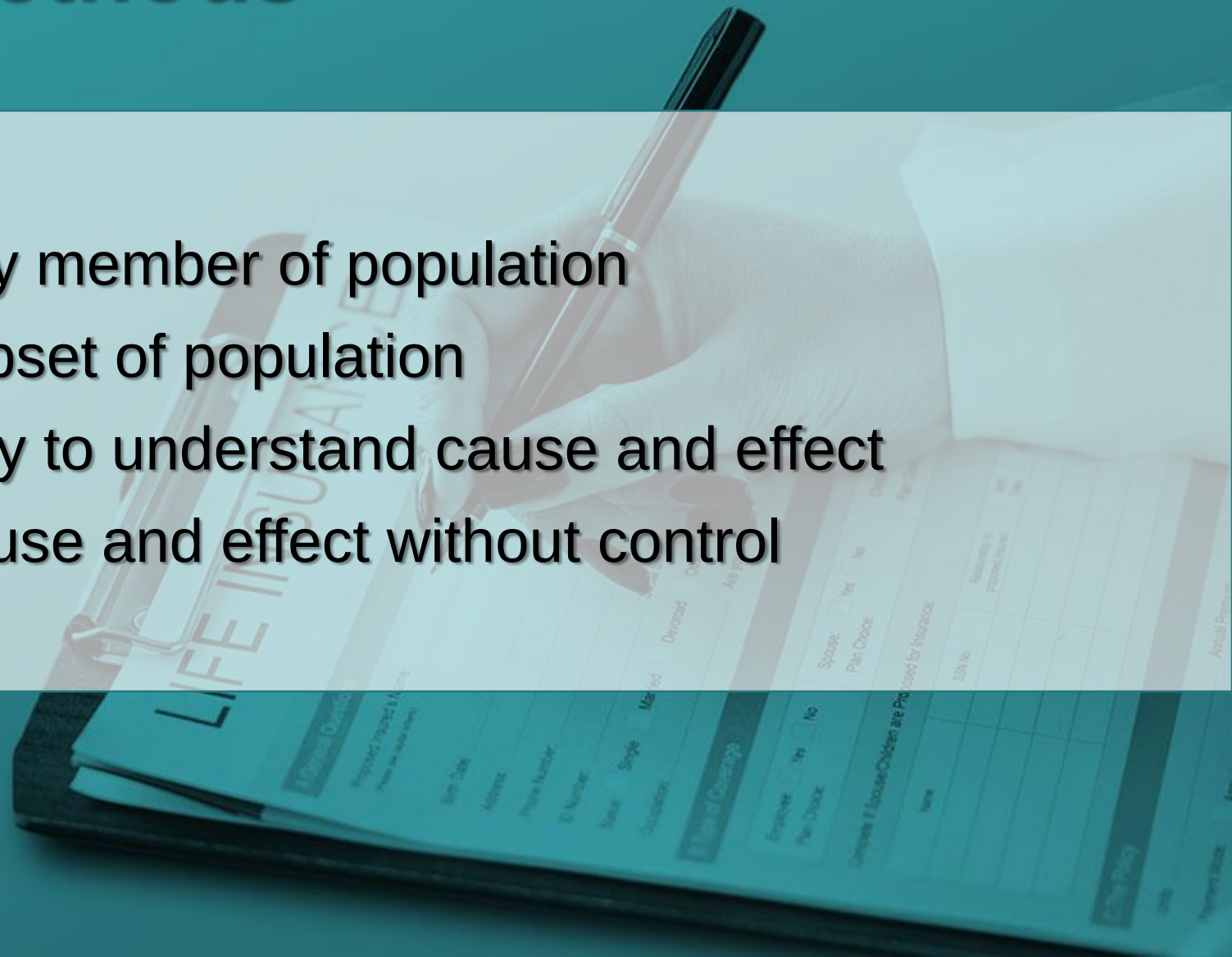
- Name of measure (speed, cycle time, accuracy, etc)
- Type of measure (input, process, output)
- Type of data (variable or attribute)
- Operational definition (enables common understanding)
- Specification (least acceptable performance)
- Target (ideal performance)
- Type of form (needed to collect data, such as check sheet)
- Sampling requirements (what level, if any)

Step 3. Review data and correct data collection sheet or tool as needed.

Step 4. Compile data in a worksheet or any statistical application available.

http://asqservicequality.org/glossary/data-collection-plan/

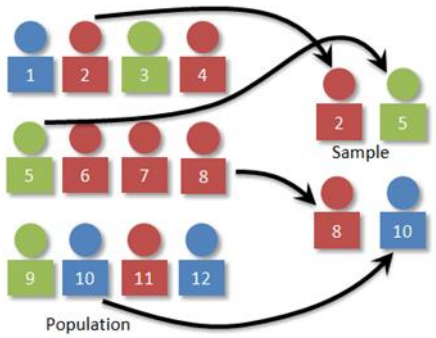
Data Collection Methods



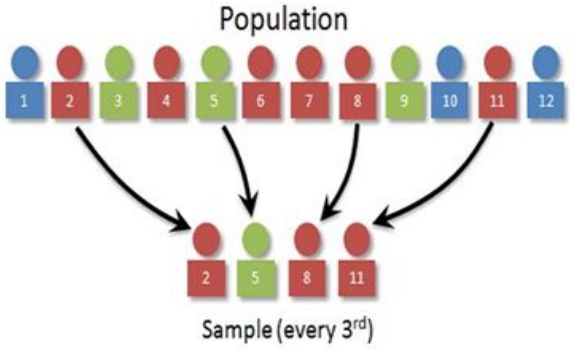
- Census: Data from every member of population
- Sampling: Data from a subset of population
- Experiment: Controlled study to understand cause and effect
- Observation : Understand cause and effect without control

Types of Sampling

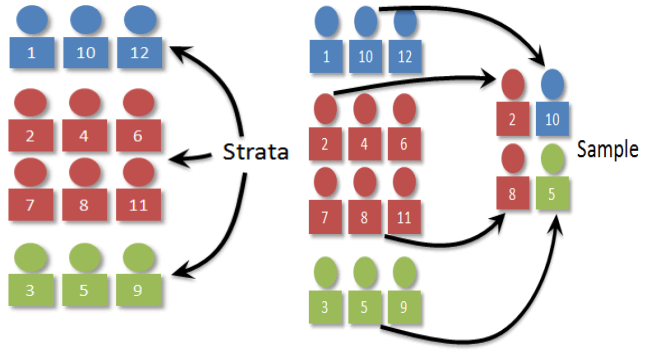
Random Sampling



Sequential Sampling



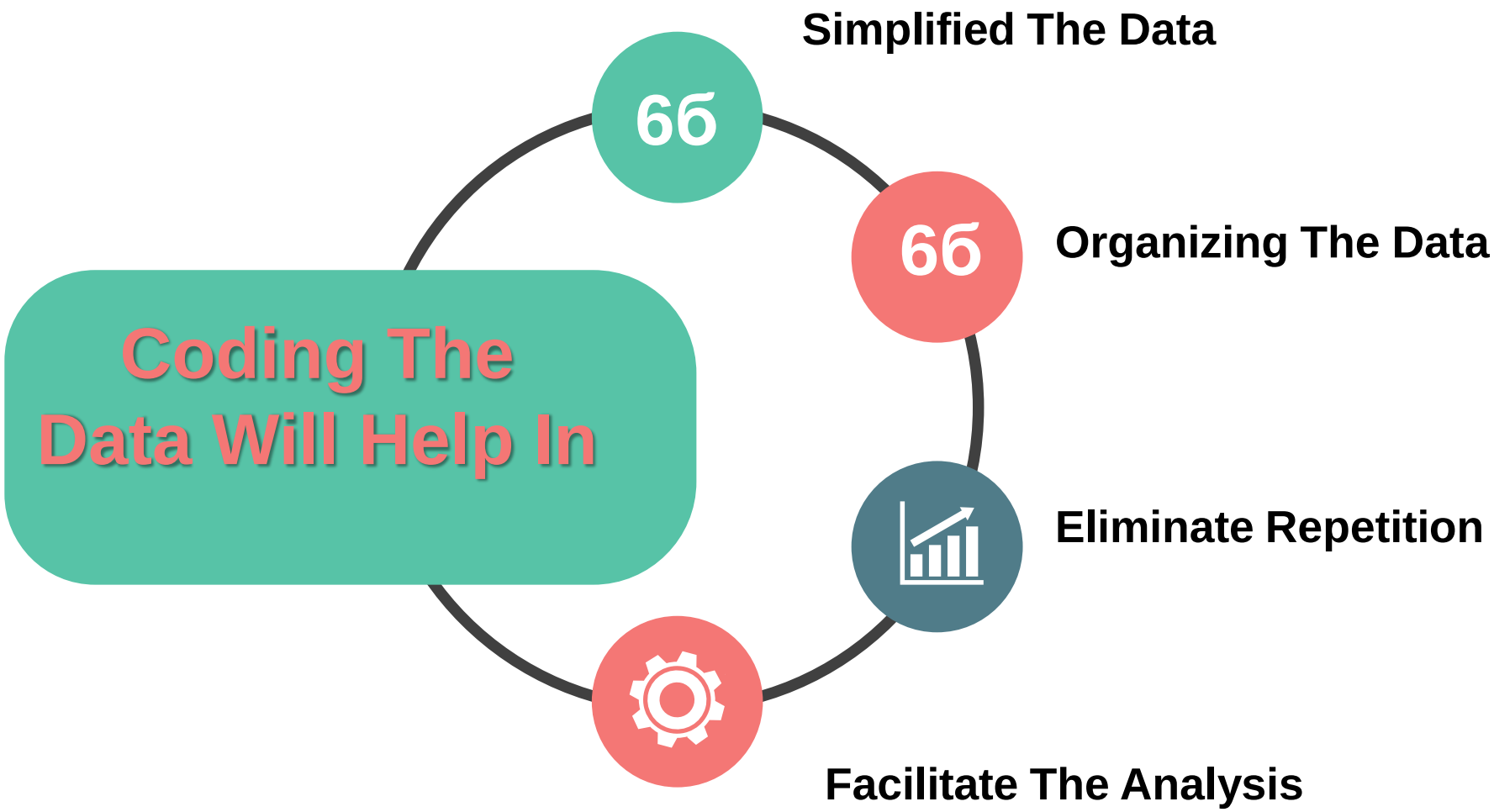
Stratified Sampling



Check Sheet

Day	Absences	Total
Monday	𝍸 𝍸 𝍸 𝍸 𝍸 ||	27
Tuesday	𝍸 𝍸 ||	12
Wednesday	𝍸 |||	8
Thursday	𝍸 𝍸 |||	13
Friday	𝍸 𝍸	10

Data Coding

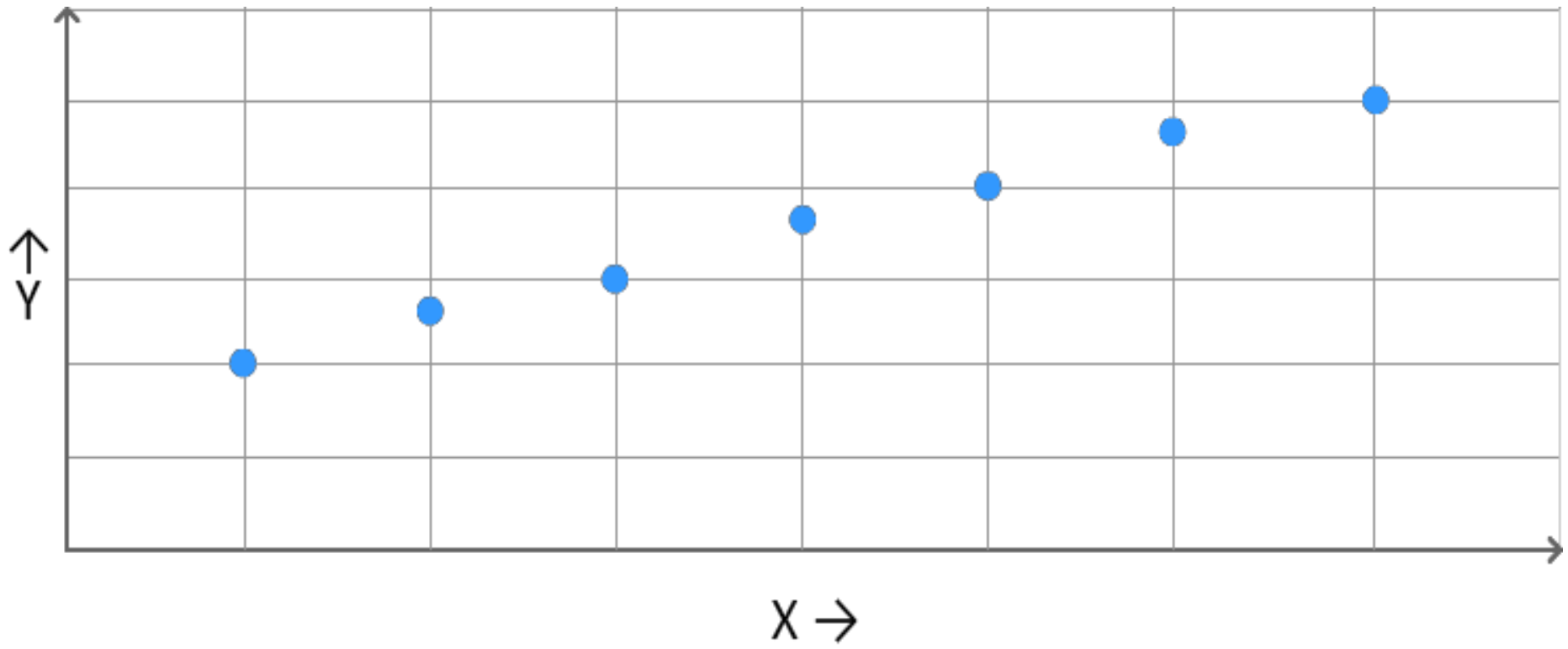

Coding The Data Will Help In
Simplified The Data
Organizing The Data
Eliminate Repetition
Facilitate The Analysis

Measure Phase

SCATTER DIAGRAMS

TYPES OF CORRELATION

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation



SCATTER DIAGRAMS

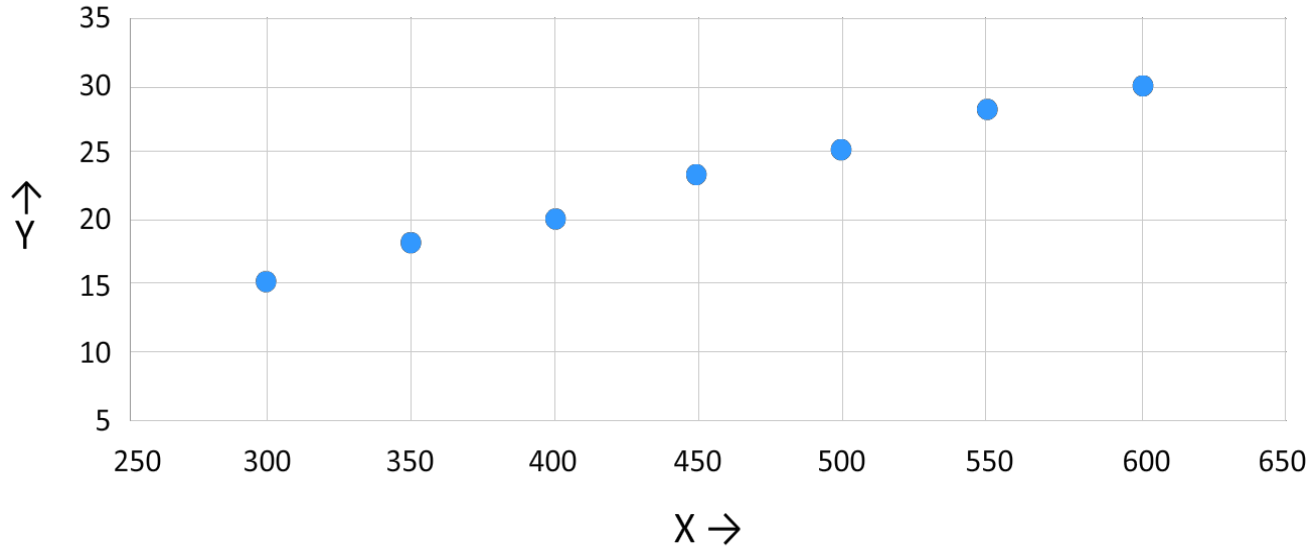
TYPES OF CORRELATION … Cont.

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation

In perfect positive correlation, as the value of X increases, the value of Y also increases proportionally.

Example: Correlation between consumption of coffee and consumption of milk

Coffee Consumption in ml (X)	Milk Consumption in L (Y)
300	15
350	17.5
400	20
450	22.5
500	25
550	27.5
600	30



Measure Phase

SCATTER DIAGRAMS

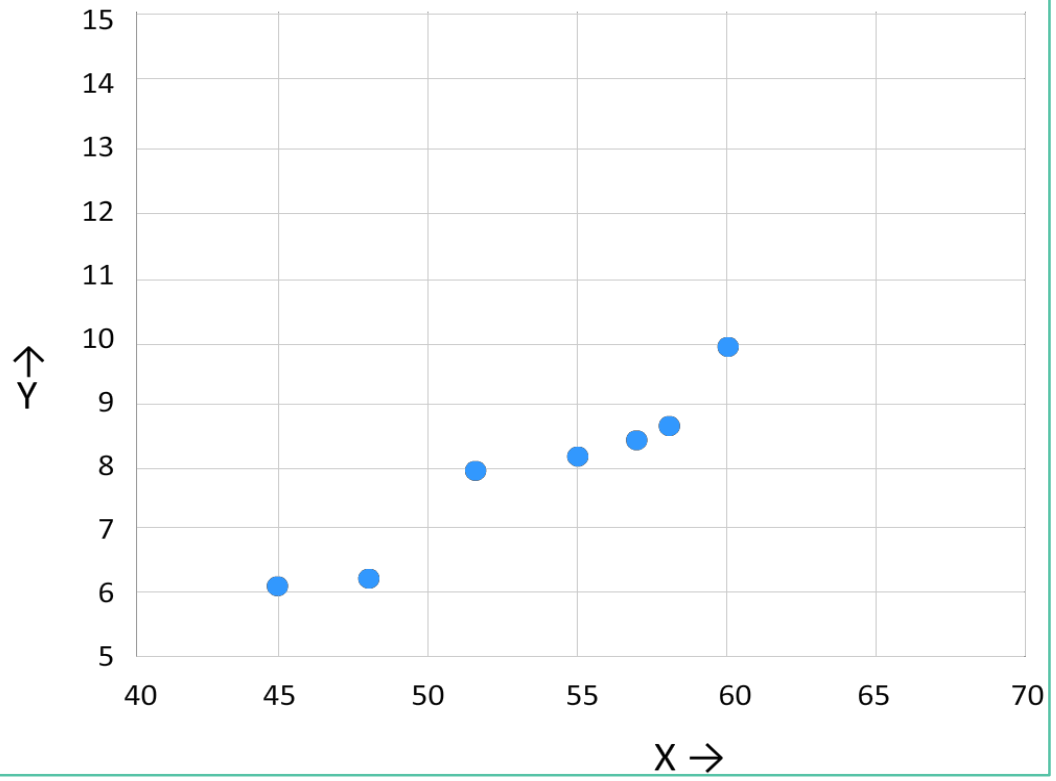
TYPES OF CORRELATION … Cont.

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation

In moderate positive correlation, as the value of X increases, the value of Y also increases but not in the same proportion.

Example: Correlation between monthly salary and monthly savings

Salary (in thousands) (X)	Savings (in thousands) (Y)
45	6
48	6.2
52	8
55	8.2
57	8.5
58	8.6
60	10
65	12



Measure Phase

SCATTER DIAGRAMS

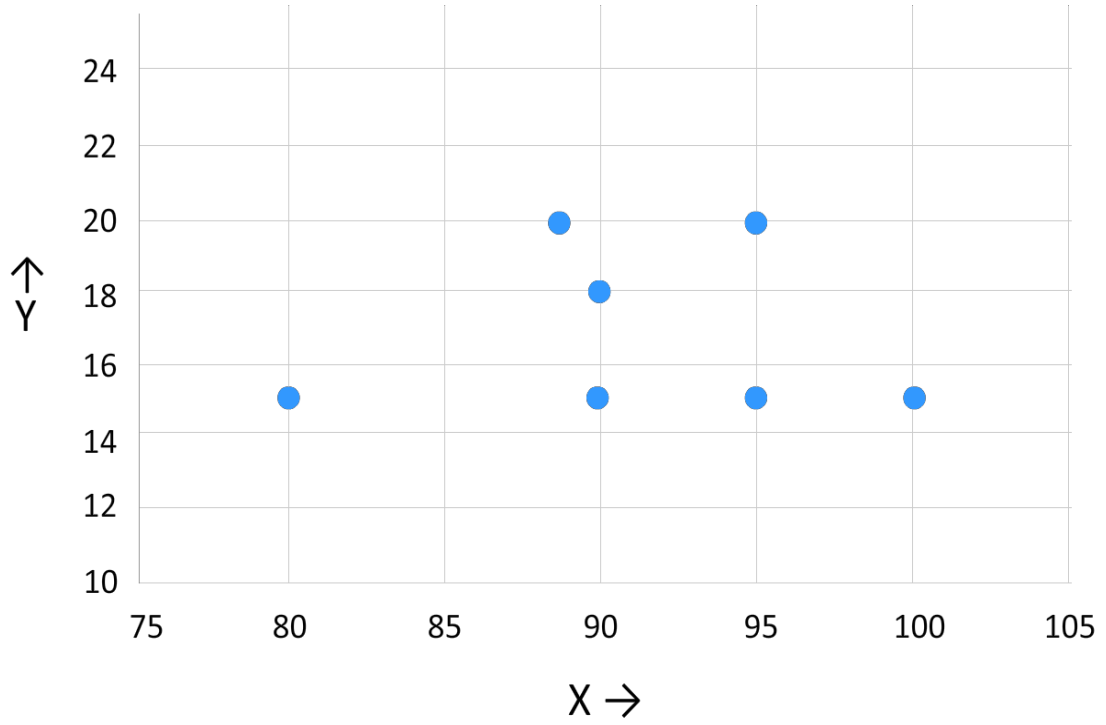
TYPES OF CORRELATION … Cont.

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation

When a change in one variable has no impact on the other, there is no correlation between them.

Example: Relation between number of recent graduates and open job positions in a city

Recent Graduates (in thousands) (X)	Open Job Positions (in thousands) (Y)
80	15
100	15
90	18
95	20
89	20
90	15
95	15



Measure Phase

SCATTER DIAGRAMS

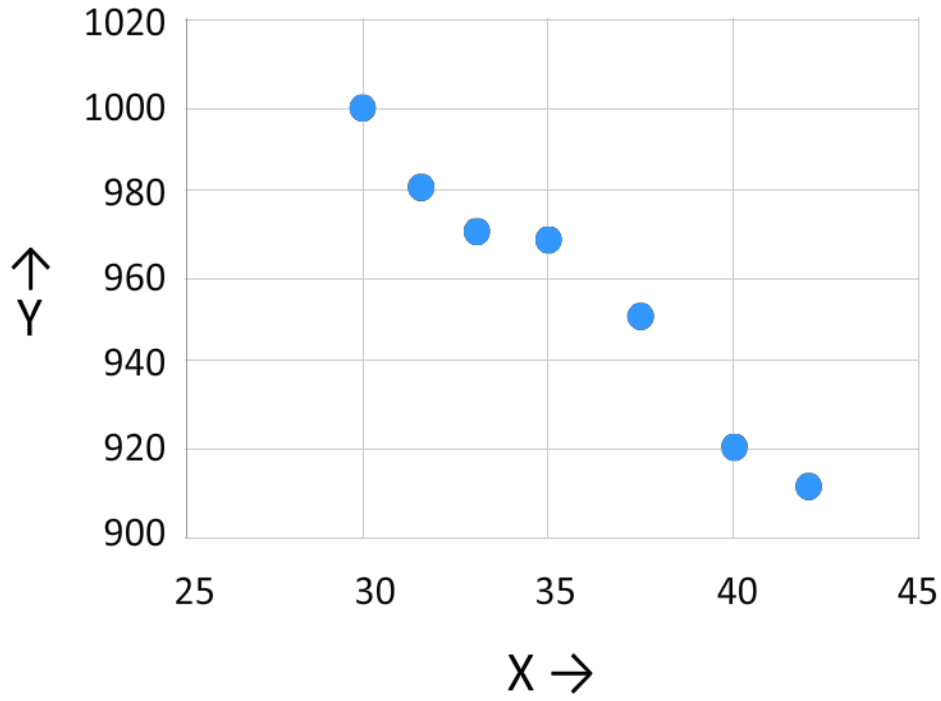
TYPES OF CORRELATION … Cont.

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation

In moderate negative correlation, as the value of X increases, the value of Y decrease but not in the same proportion.

Example: Correlation between the price of a product and the number of units sold

Unit Price of Product (in thousands) (X)	Units Sold (Y)
30	1000
32	980
33	970
35	965
38	950
40	920
42	910



SCATTER DIAGRAMS

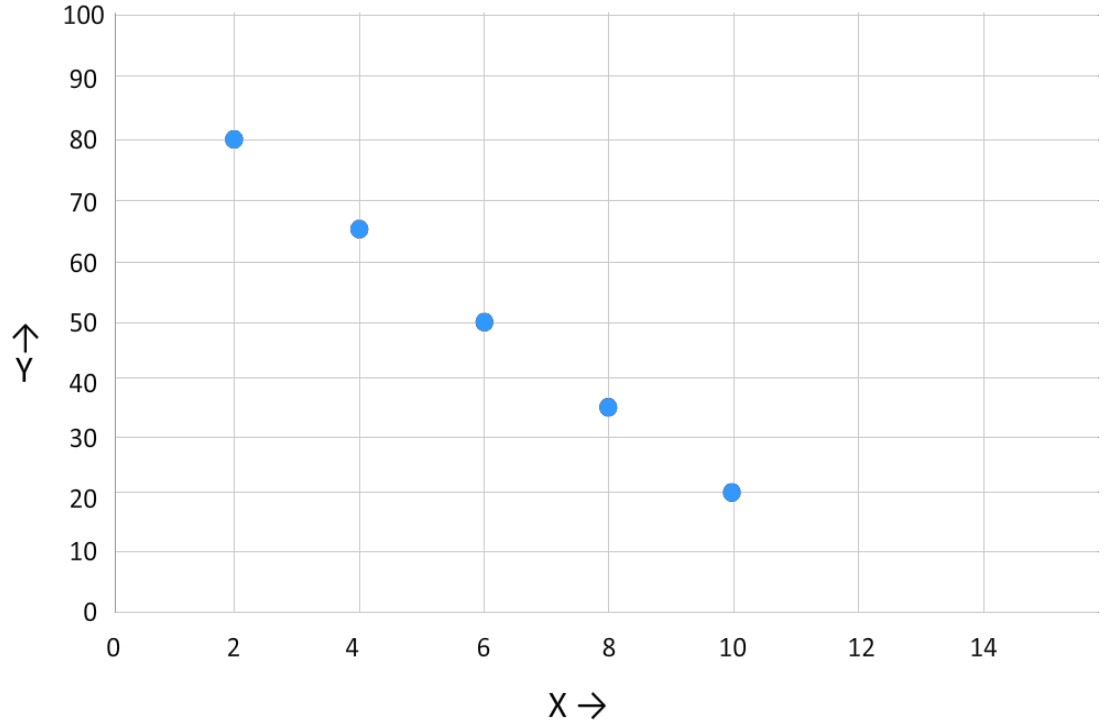
TYPES OF CORRELATION … Cont.

Perfect positive correlation	Moderate positive correlation	No Relation	Moderate negative correlation	Perfect negative correlation

In perfect negative correlation, as X increases, Y decreases proportionally.

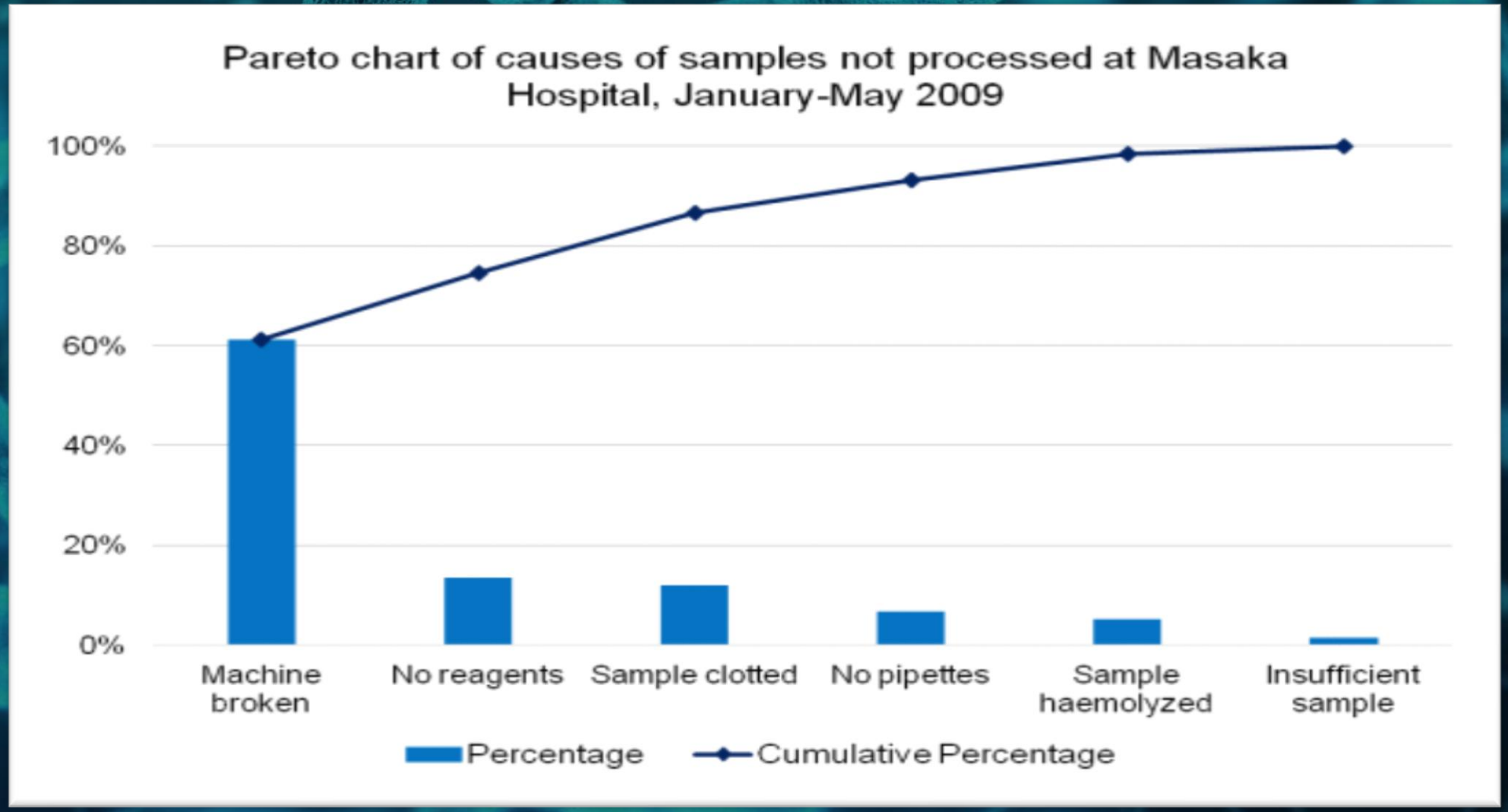
Example: Correlation between project time extension and project success

Time Extension (in days) (X)	Project Success Probability (in percentage) (Y)
2	80
5	60
7	40
10	20
13	00



Measure Phase

Pareto



Exercise ....

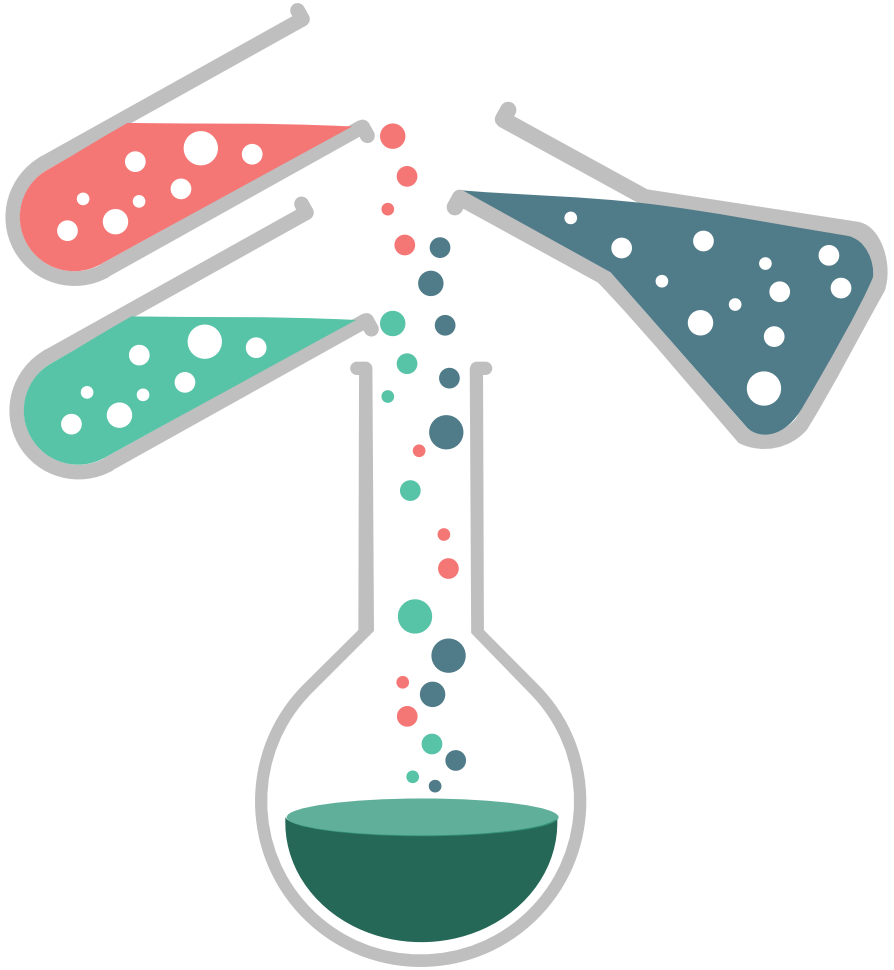

6σ
MEASURE
ANALYSE
IMPROVE
CONTROL
Kaizen
Manufacturing
Lean
6σ
Six Sigma
Process

Measure Phase

Summarize And Visualize The Data

Analyze

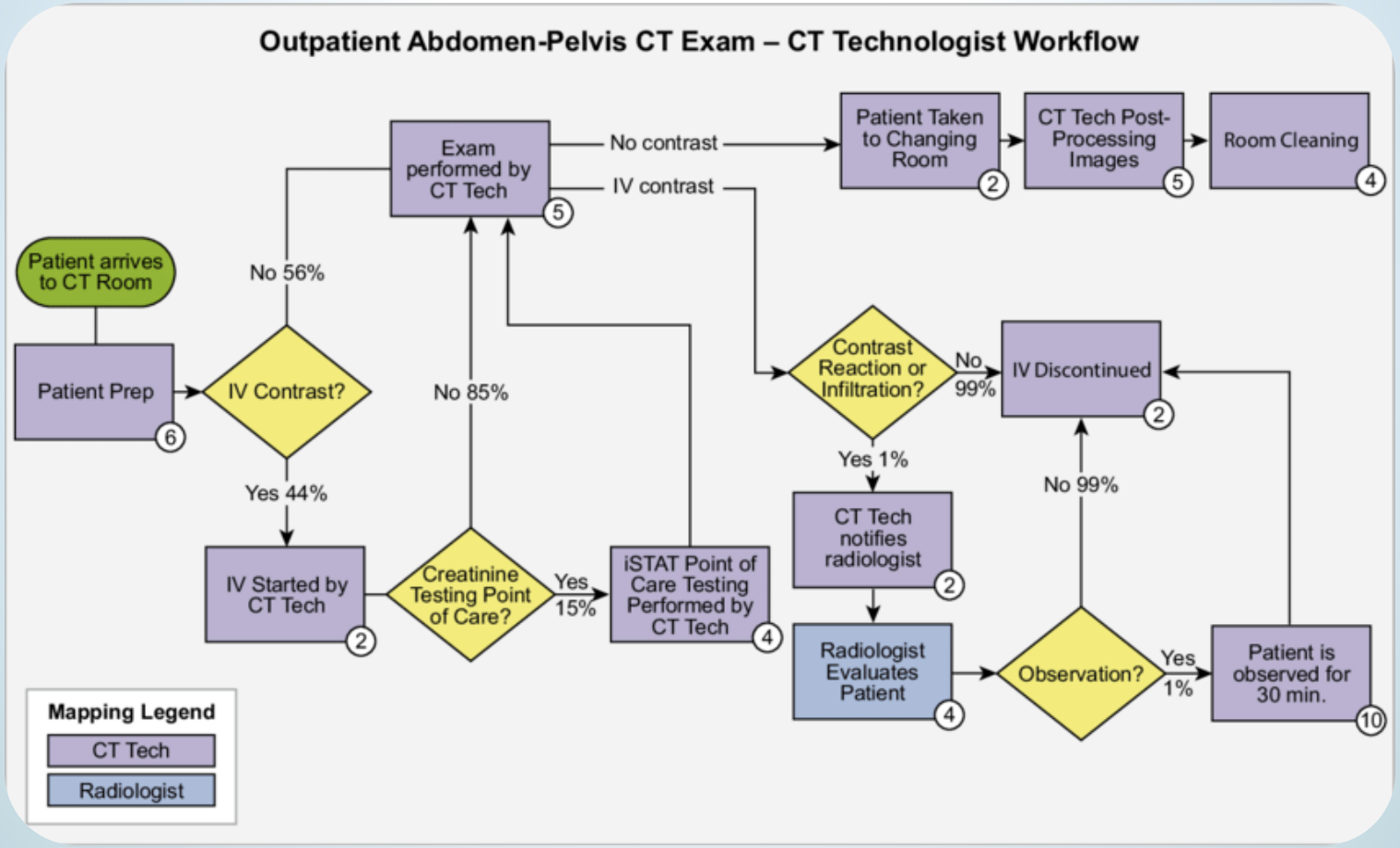
- **As-Is Process Mapping**
- **Control Impact Matrix**
- **Hypothesis Testing**



As-is Process Mapping

- It tells us all the activities being carried out to obtain the output.
- It gives a list of critical inputs.
- It shares which of these activities are value added and which are non value added
- It helps to determine the bottlenecks.
- It provides data collection points.
- It also helps in identifying the efficiency of the process
- We capture the processing time for each activity.

As-is Process Mapping



Analyze Phase

Exercise ....

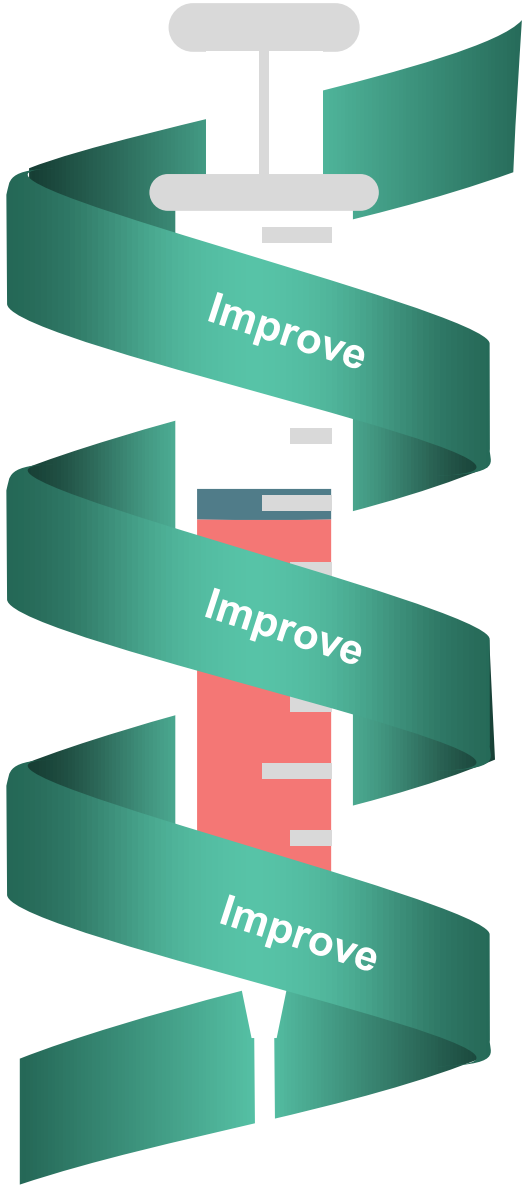
Hypothesis Testing

- A hypothesis test is a method for making rational decisions about the reality of effects. Most decisions require choosing from one or more alternatives.

- The decision is based on incomplete information. A team might be considering using a different method which they believe will give them a better result. Their theory is that method A is going to be better than method B.

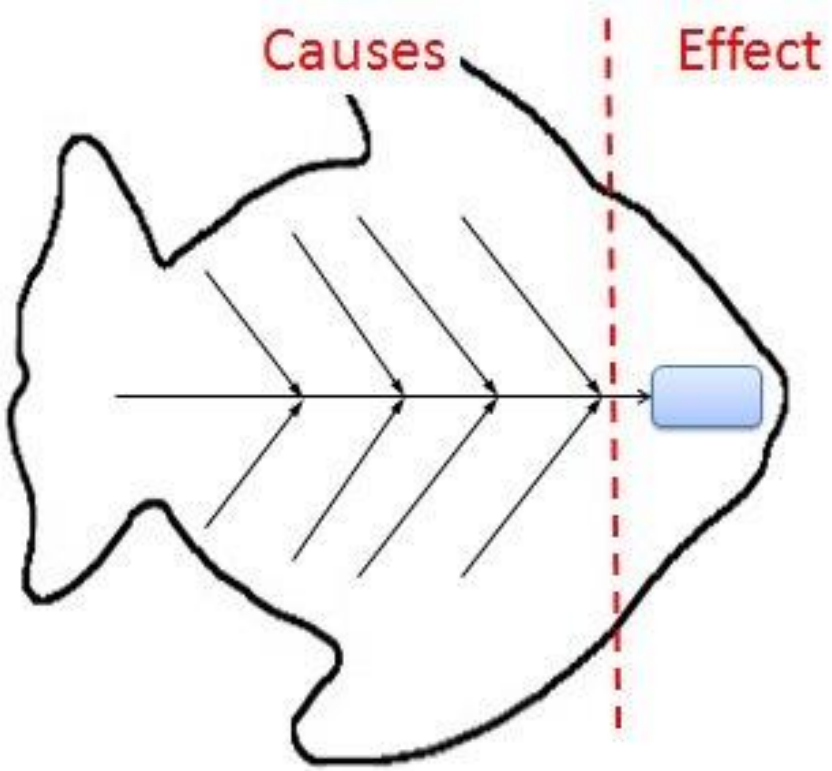
Improve

- **Root Cause Analysis**
- **Lean**
- **Evaluating And Selection**



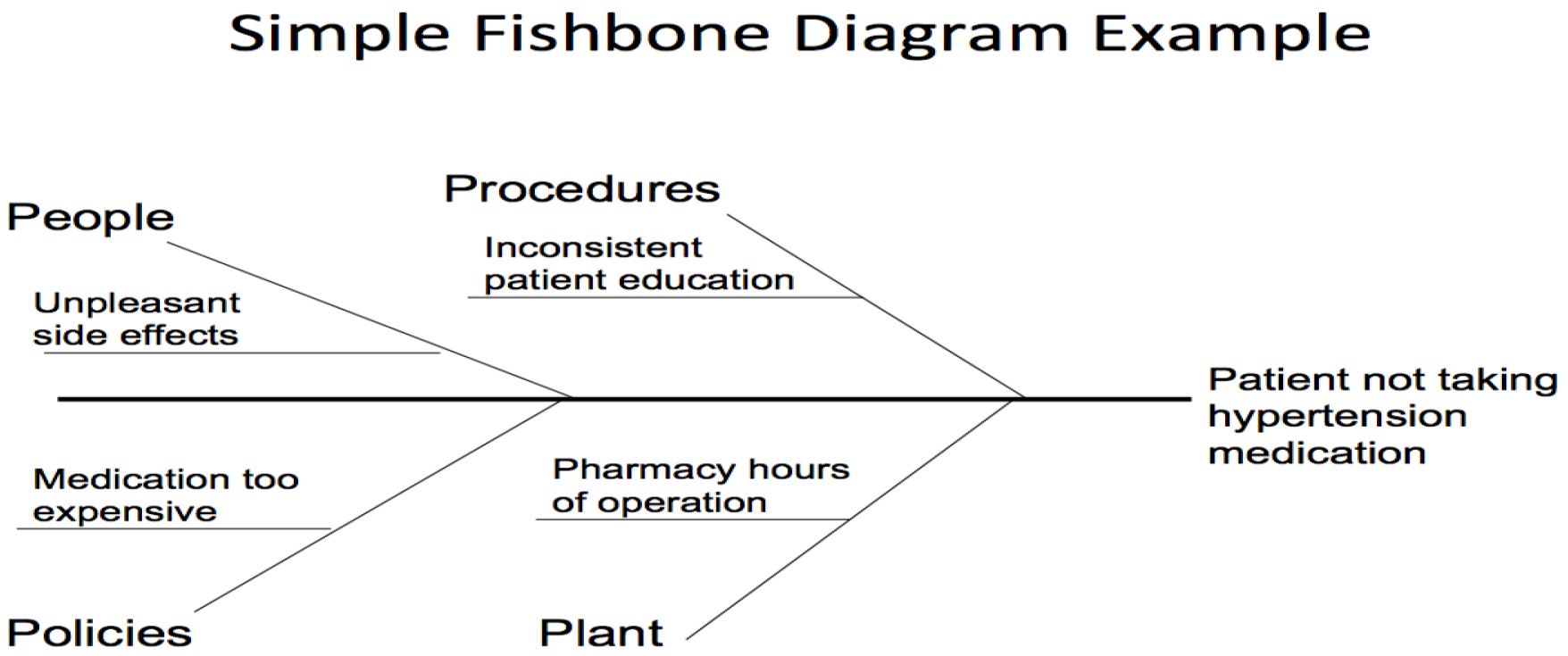
Fishbone

- **Used to find the root cause and potential solutions**



Analyze Phase

Fishbone



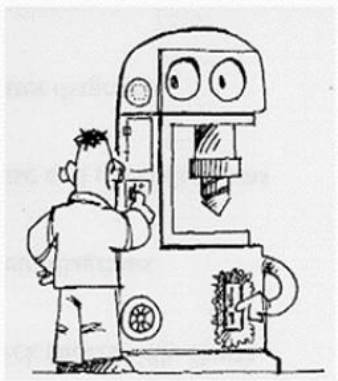
Source: Kelly, D. L. 2006. Applying Quality Management in Healthcare, 2nd Edition.

Analyze Phase

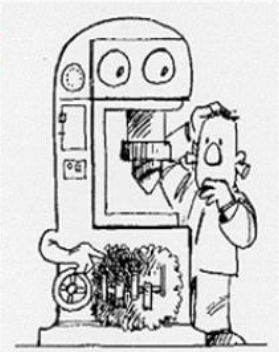
Exercise ....

Analyze Phase

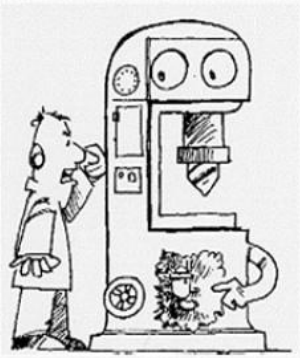
The 5 whys ….



Q : WHY has machine stopped ?
A : Overload tripped out !



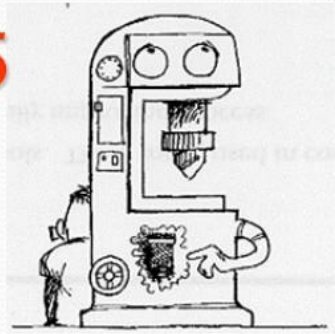
Q : WHY overload trip ?
A : Insufficient oil on shaft !



Q : WHY Insufficient oil ?
A : Oil pump in efficient !

5 WHYS

Q : WHY is pump not efficient ?
A : Pump drive shaft worn !



Q : WHY is this shaft worn ?
A : Oil filter blocked with swarf !

Root Cause

Lean Thinking

- Lean thinking focus on the elimination of waste in all forms and smooth, efficient flow of materials and information throughout the value chain to obtain faster customer response, higher quality, and lower costs.
- Value-added activities are those that add value to a product by transforming it. Non-value-added activities are those that do not add value, such as rework or waiting for tools or service.
- Lean thinking considers nonvalue-added activities as waste.

Analyze Phase

Types of Waste

1. Overproduction
2. Waiting time
3. Unnecessary transportation
4. Unnecessary processing
5. Inventory
6. Unnecessary motion
7. Production defects

Analyze Phase

Select A Solution

- **Brainstorming is a useful method**
- **Cost and benefits analysis**
- **Piloting**

Control

- **Statistical process control SPC**
- **Control Chart**
- **Control Plan**

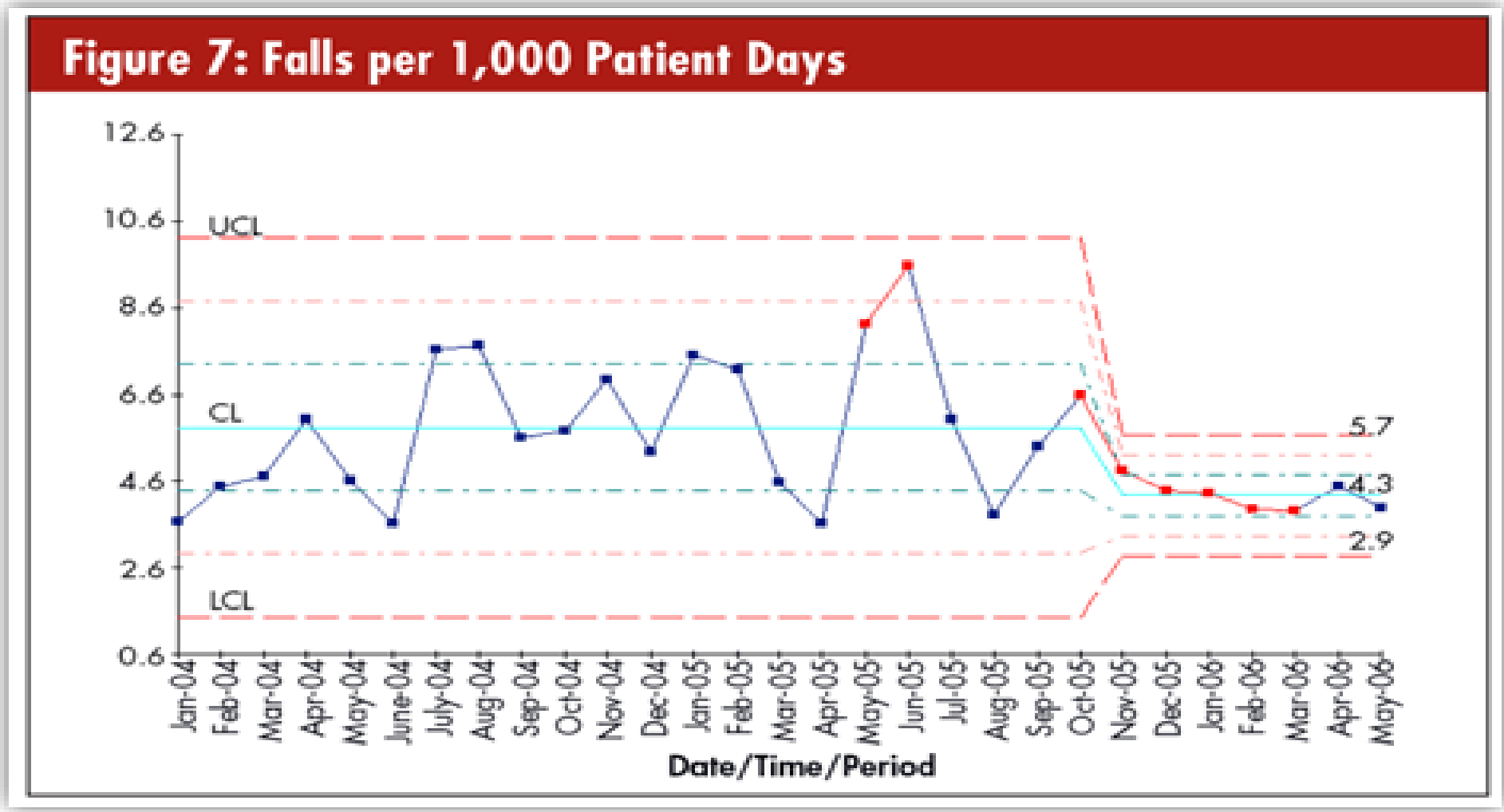
Statistical Process Control (SPC)

- Traditionally SPC has been used to monitor and control the output parameters of the process .
- The key elements that constitute a process control system are:

1. Documentation of the process
2. Develop process metrics
3. Monitor the process based on the defined metrics

Control Phase

Control Chart

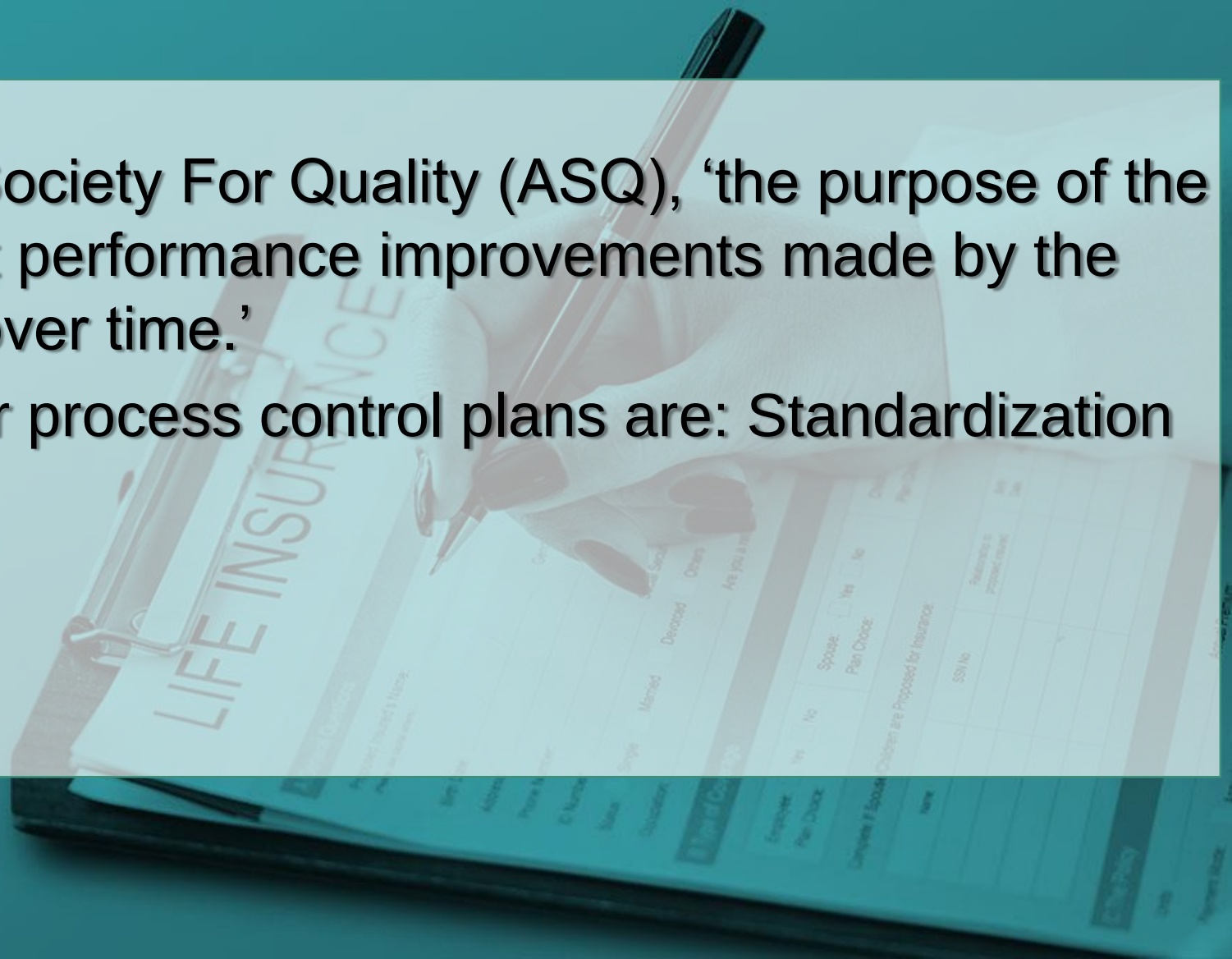


Control Phase

Exercise ....

Control Plan

- According to the American Society For Quality (ASQ), ‘the purpose of the control plan is to ensure that performance improvements made by the project team are sustained over time.’
- The four techniques used for process control plans are: Standardization
- Documentation
- Monitoring Plan
- Response Plan



Standardization

- There should-be process helps answer queries like:
  - What are the steps in the process?
  - Who does these steps in the process and when?
  - Where more detailed work instructions can be found?

Control Phase

Standardization

- **Standardizing the (should-be) process helps answer queries like:**

- **What are the steps in the process?**
- **Who does these steps in the process and when?**
- **Where more detailed work instructions can be found?**

Documentation

- **Documentation is a necessary step to insure that the learning gained via improvement is institutionalized and shared across the team by having it documented with proper work procedures.**

Project Planning

Monitoring: Helps detect changes as and when they occur in the process and assure that improvements continue to hold for us to be able to meet customer requirements over a period of time.

- Addition or removal of a step in the process.
- Changes to human resources and training requirements.
- Addition or removal of equipment utilized in the process.
- Changes to capital and funding.

Response Plan

Identify

Response plan helps identify:
The next steps on what needs to be done if one detects a change in the process while monitoring.
the response plan helps define:

Define

The Response Plan Helps Define:
What actions will be taken for an out-of-control event occurrence with a timeframe for the action
Who takes action based on the monitoring data

Thank You ...