

# Problem Solving Skills.

Is there a magic formula for Problem Solving ????



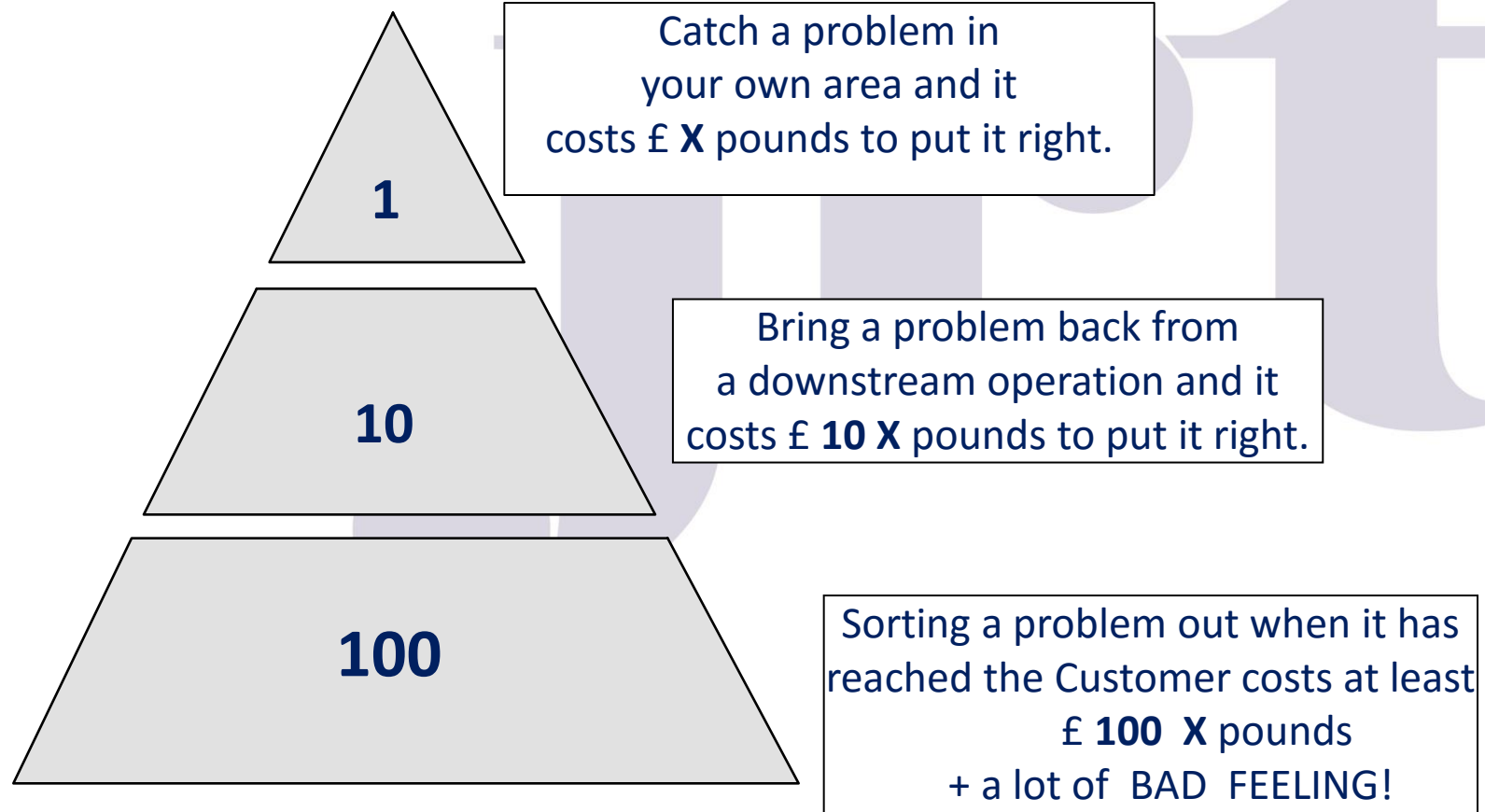
Or.....



Dr. John R. Thomas



# Remember the 1:10 : 100 Rule



*This is a factor that should be continually emphasised.*

How do we identify the Problem ?

# The 5 WHY's ?

Ask why?

.....5 times....



# THE 5 Why's in action...

Why did the machine stop ?.

There was an overload and the fuse blew

Why was there an overload?

The bearings were not sufficiently lubricated.

Why were they not lubricated?

The lubrication pump was not pumping sufficiently well.

Why was it not pumping sufficiently well?

The shaft on the pump was worn and rattling.

Why was the shaft worn ?.

There was no strainer attached To the oil pump and metal got in.

# The Six Problem Solving Steps...

1. Identify the problem.
2. Define the Problem.
3. Investigate the Problem.
4. Analyse the Problem.
5. Solve the Problem.
6. Confirm the result.

*The Diagnostic  
Journey*

*The Remedial  
Journey*

# Seven Problem Solving Tools

- Pareto Analysis
- Flowcharts
- Checklists
- Histograms
- Scatter Diagrams
- Control Charts
- Cause-and-Effect Diagrams

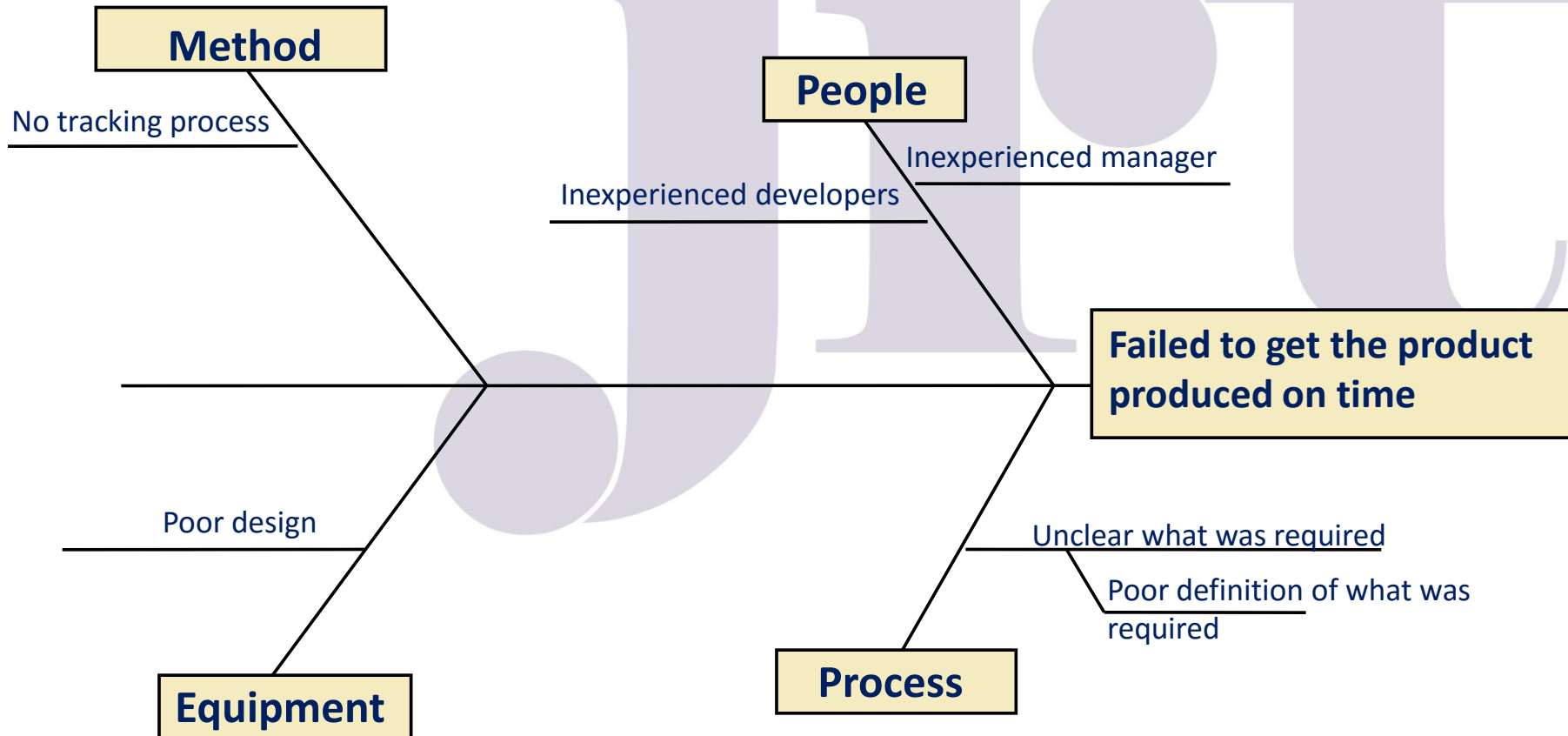
# Cause and Effect Analysis....

## *Structured Brainstorming.*

A Cause and Effect or Fishbone Diagram (Ishikawa Diagram) to display the relationships between a given **effect** and its potential **causes**.

Such a graphical technique is used to sort out and relate the interactions among the factors that could cause a problem.

# Example





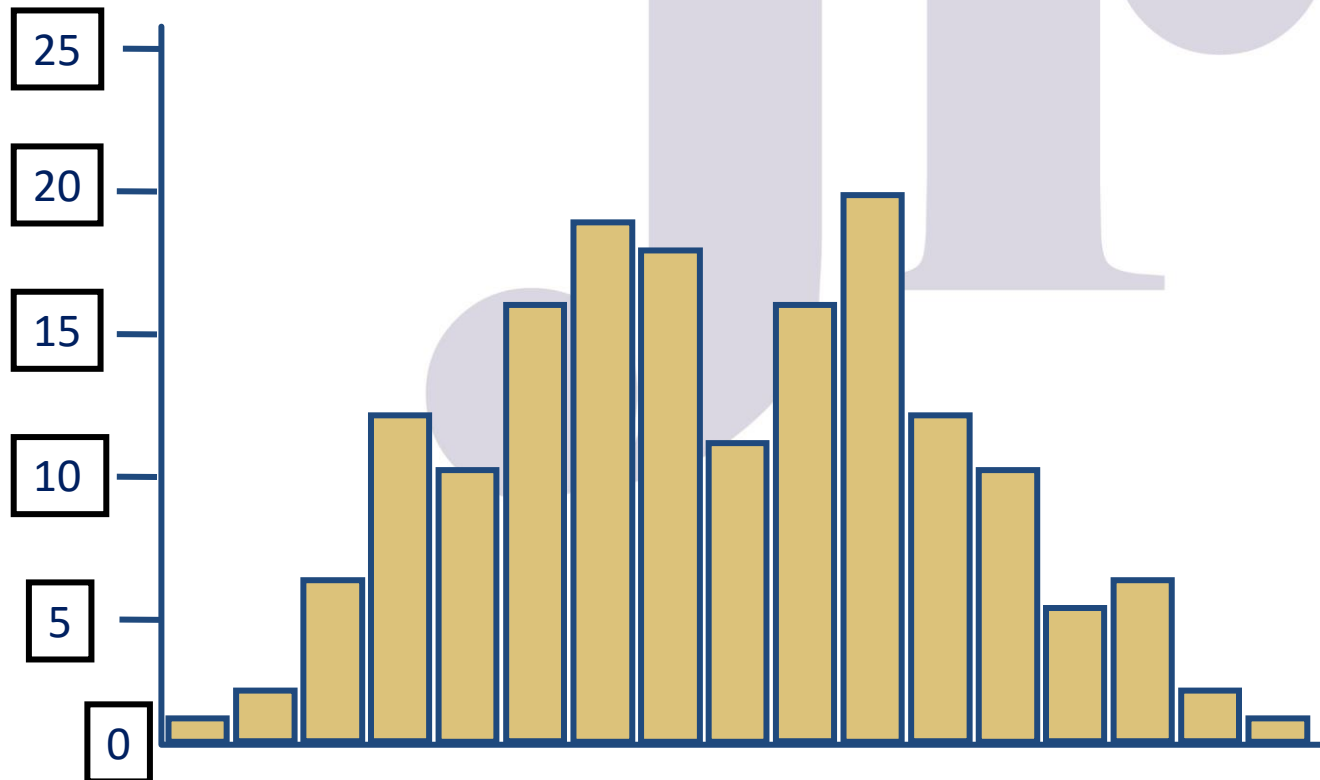
# Check Sheet

- Check sheets are forms that can be used to systematically collect data.
- Check sheets give the user a place to start and provides the steps to be followed in collecting the data

COMPONENTS REPLACED BY LAB	
TIME PERIOD: 22 Feb to 27 Feb 2016	
REPAIR TECHNICIAN: Bob	
TV SET MODEL 1013	
Integrated Circuits	
Capacitors	
Resistors	
Transformers	
Commands	
CRT	

# Histogram

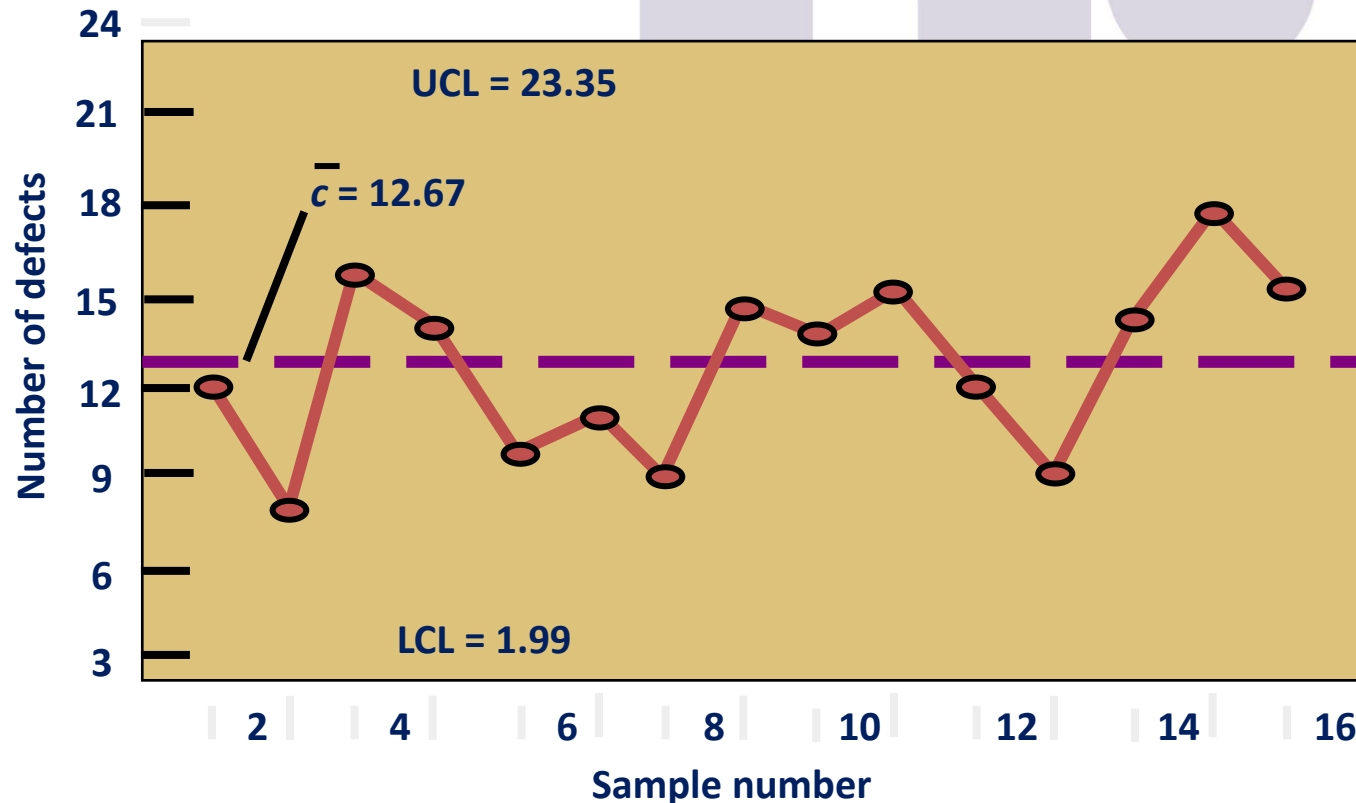
Histograms help in understanding the variation in the process. It also helps in estimating the process capability.



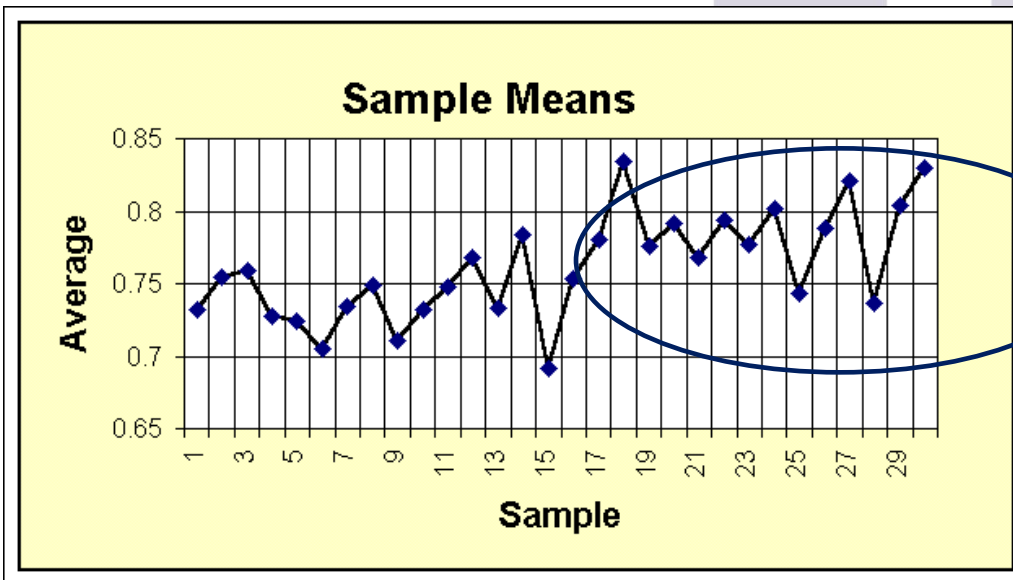
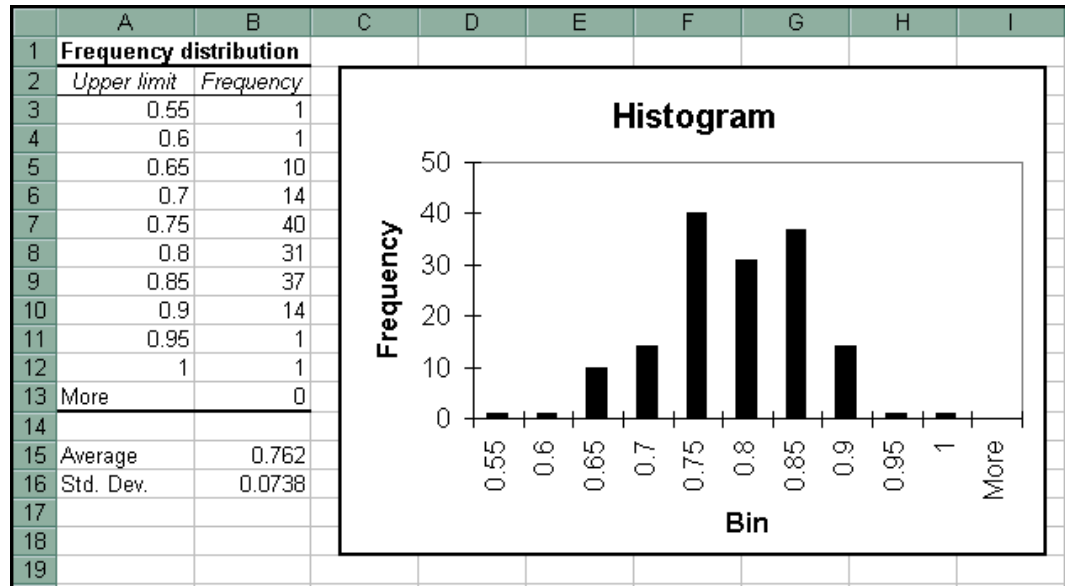
# Control Chart

A control chart is a run chart with limits.

This is helpful in finding the amount and nature of variation in a process.



Histograms do not take into account changes over time.



Control charts can tell us when a process changes

# 80/20 Rule - the Pareto Principle

Suggested by an Italian economist Vilfredo Pareto in 1897 as an economic principle i.e. 20% of the population owns 80% of wealth of a society.

Later it was found that the rule could be applied to many other fields.

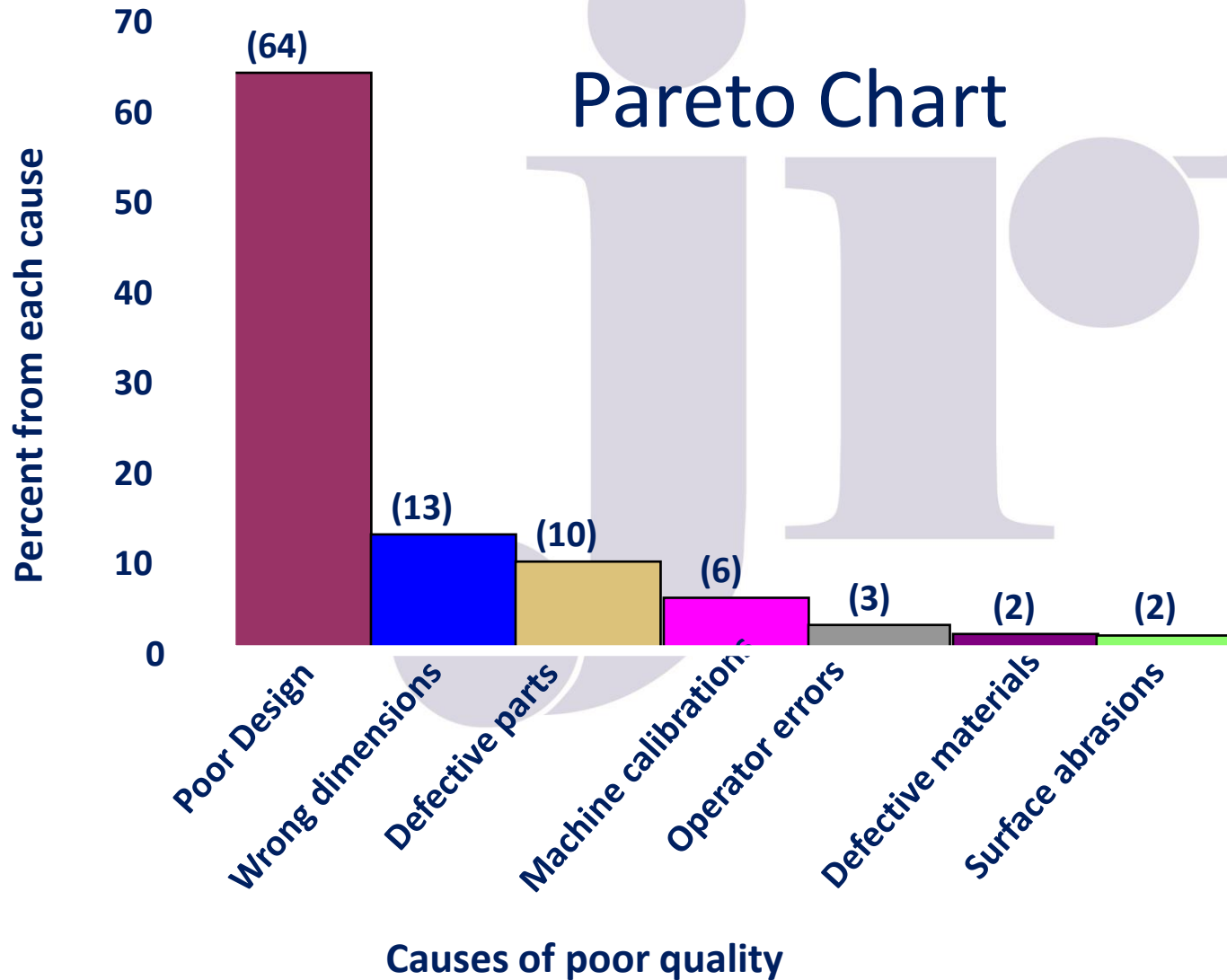
# 80/20

Conclusions drawn from the principle: All things not equally important.

Identify the few that yield the majority of results and concentrate your efforts on these - don't be bothered by the rest.

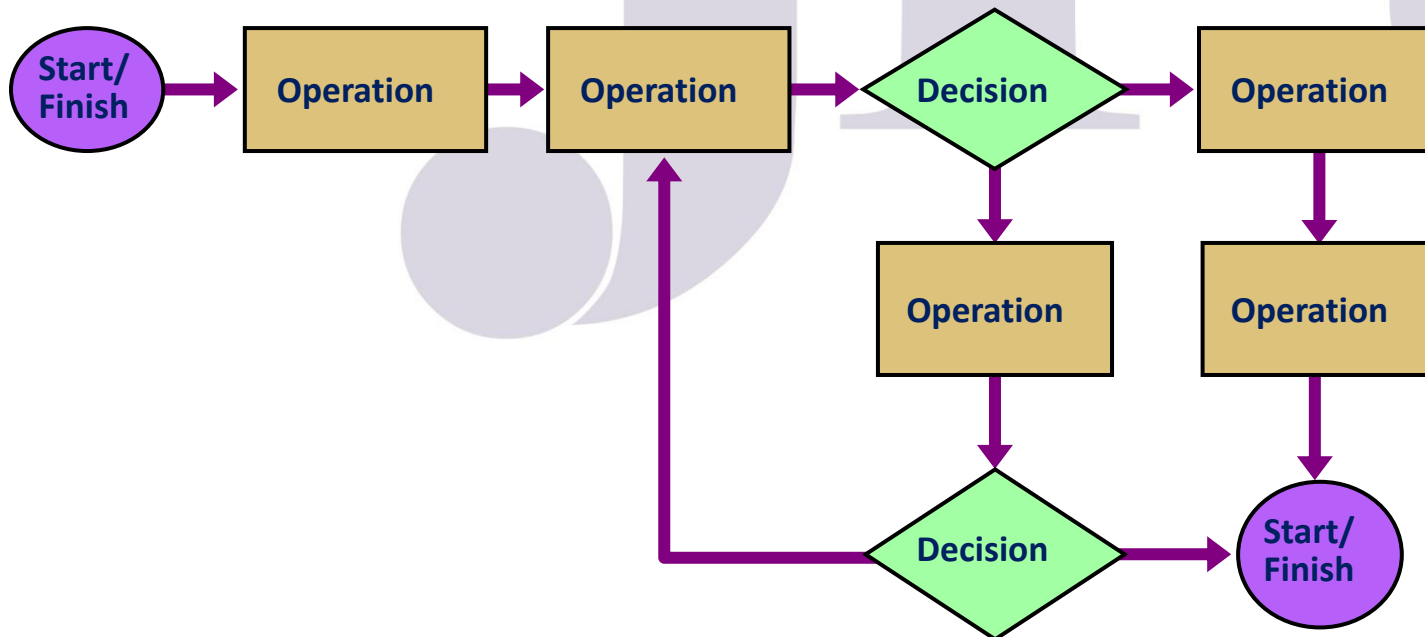
The first 20% of efforts achieves 80% of results.

You put the remaining 80% of efforts to achieve only the last 20% of results!



# Flow Charts

- Flow charts are graphical representation of steps involved in a process.
- Flow charts give in detail the sequence involved in the material, machine and operation that are involved in the completion of the process.
- Thus, they are the excellent means of documenting the steps that are carried out in a process.



# Scatter Diagram

It is a graph of points plotted; this graph is helpful in comparing two variables. The distribution of the points helps in identifying the cause and effect relationship between two variables.

