“Back to basics, indispensable tools never lose their value”

Jim Nelson - Quality Assurance Manager, Loram

Agenda

- Cause-and-effect (5 min)
- Check sheet (5 min)
- Control charts (5 min)
- Histogram (5 min)
- Pareto chart (5 min)
- Scatter diagram (5 min)
- Stratification (5 min)
- Guidelines for Reporting Data (5 minutes)
- Questions & Answers (15 min)

Cause & Effect Analysis

Why use?

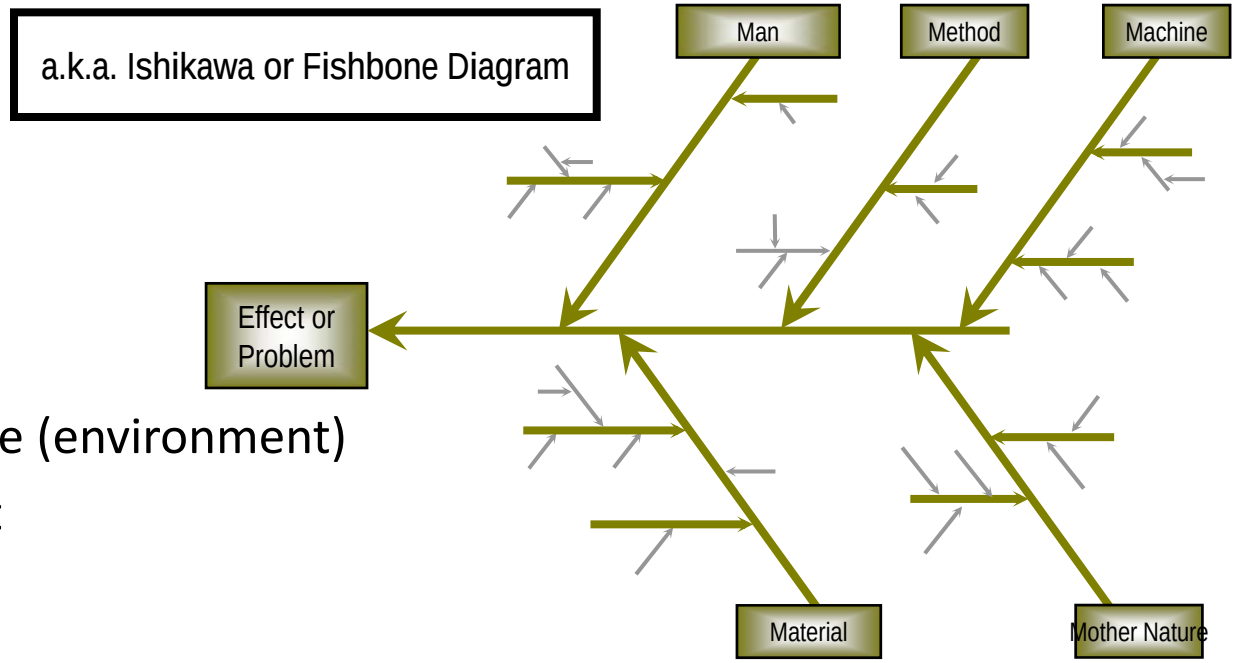
- Identify the Cause for a defect or problem

How?

- Ask Why? 5 times and branch off higher level causes

What?

- Man
- Method
- Machine
- Material
- Mother Nature (environment)
- Measurement



Check Sheets

Why use?

- Collecting and analyzing data (wide variety)

How?

- Decide on data, design form, test, revise and record

What?

- Frequency or patterns, problems, defects, etc.
- Observed data
- Collected repeatedly
- Production processes

Defect Types/ Event Occurrence	Dates							
	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	TOTAL
Defect 1								
Defect 2								
Defect 3								
Defect 4								
Defect 5								
Defect 6								
Defect 7								
Defect 8								
Defect 9								
Defect 10								
TOTAL								

Control Charts

Why use?

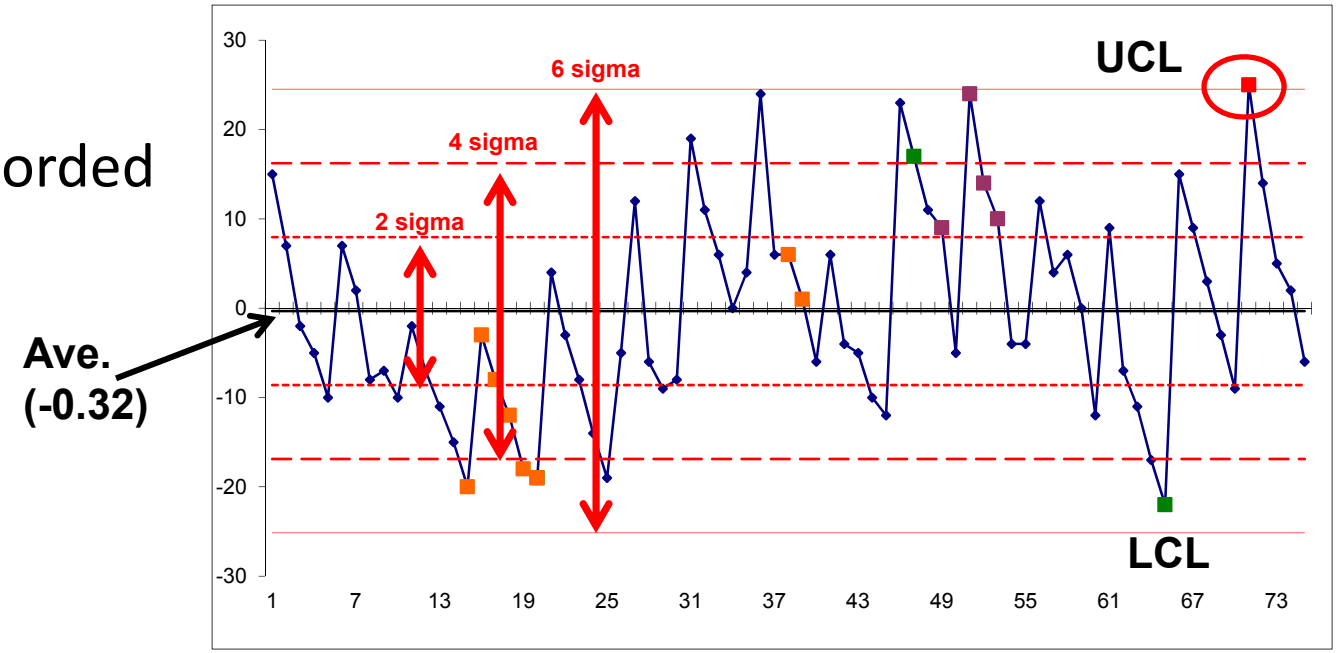
- Study how a process changes over time

How?

- Select appropriate chart and time period
- Collect data, construct chart and analyze data

What?

- Any data recorded over time



Histograms

Why use?

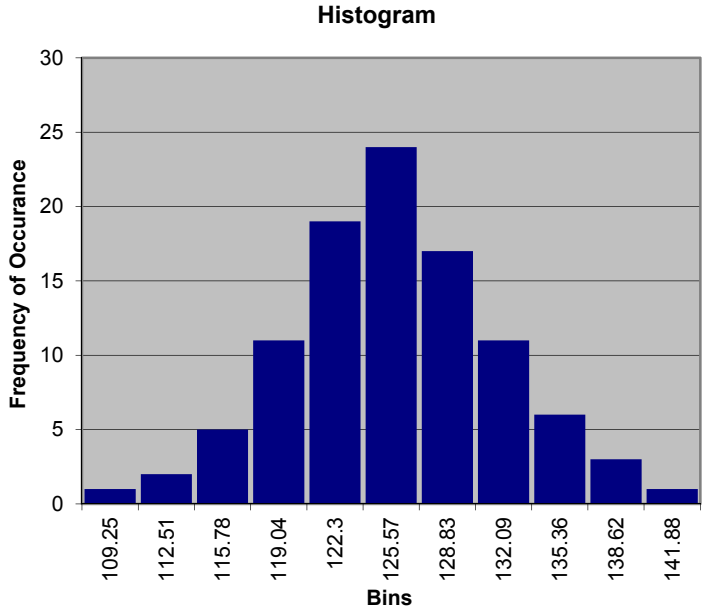
- Show frequency distributions or how often each category value occurs
- Determine process normality or differences
- Determine if process meets Customer Requirements

How?

- Collect data & determine categories
- Determine range and labels
- Develop graph, label axis & input

What?

- Numerical data



Pareto Chart

Why use?

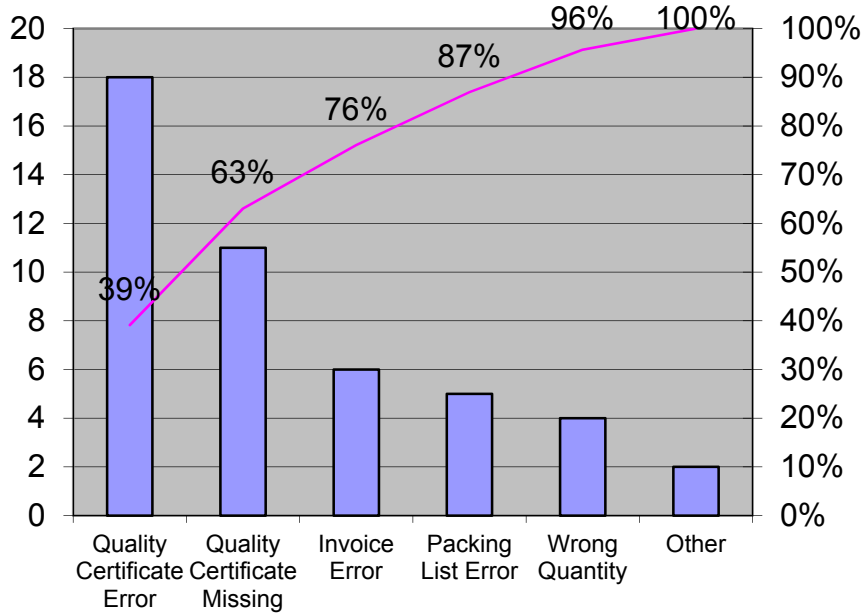
- Determine frequency of categories to focus on most significant

How?

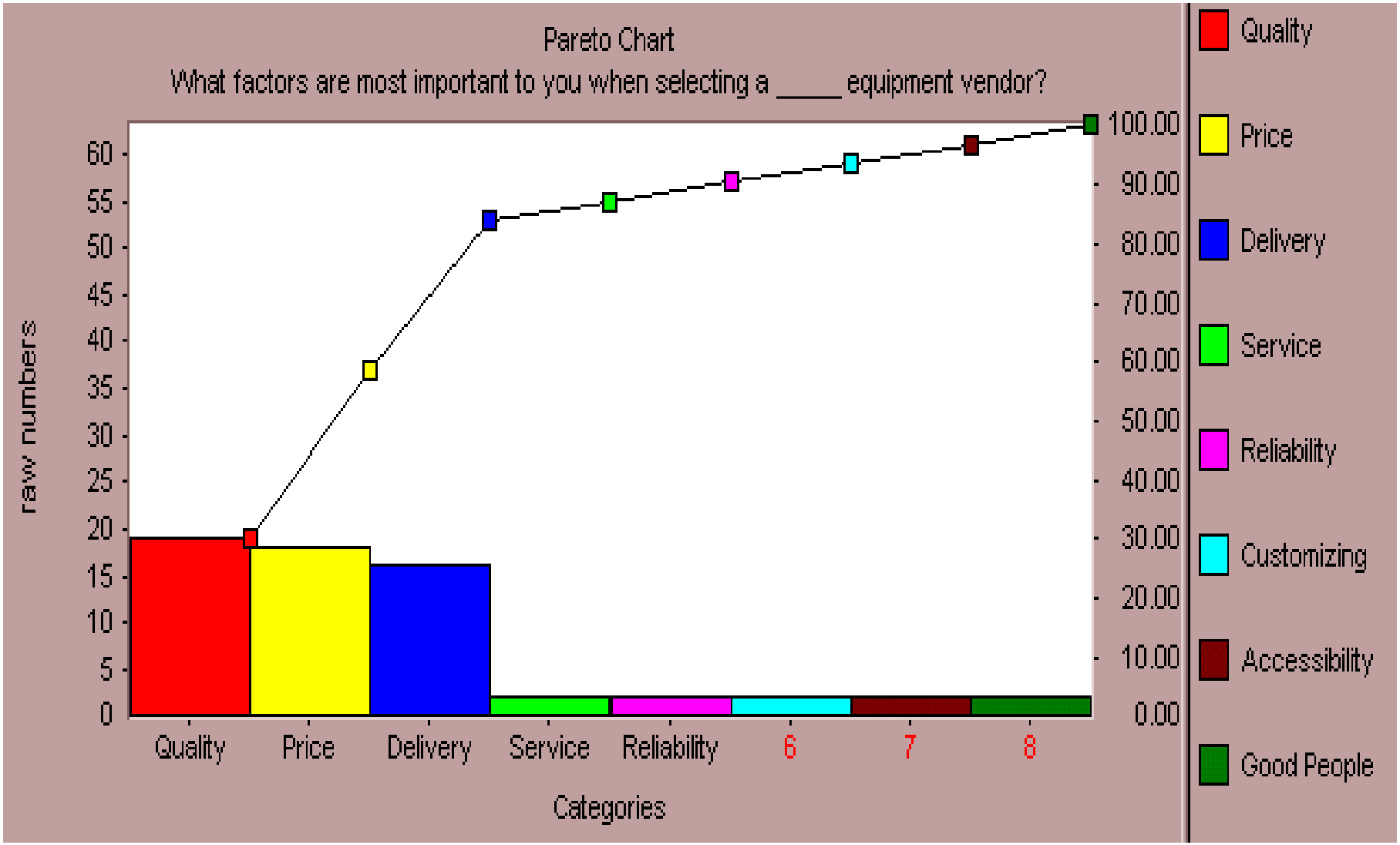
- Decide categories, measurement and time period
- Collect data, subtotal for each category
- Develop graph and labels
- Input data

What?

- Data that can be categorized



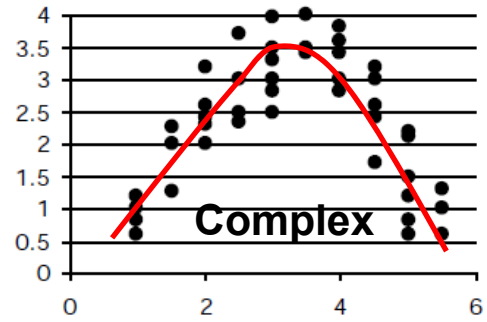
Pareto of Customer Feedback



Scatter Diagram

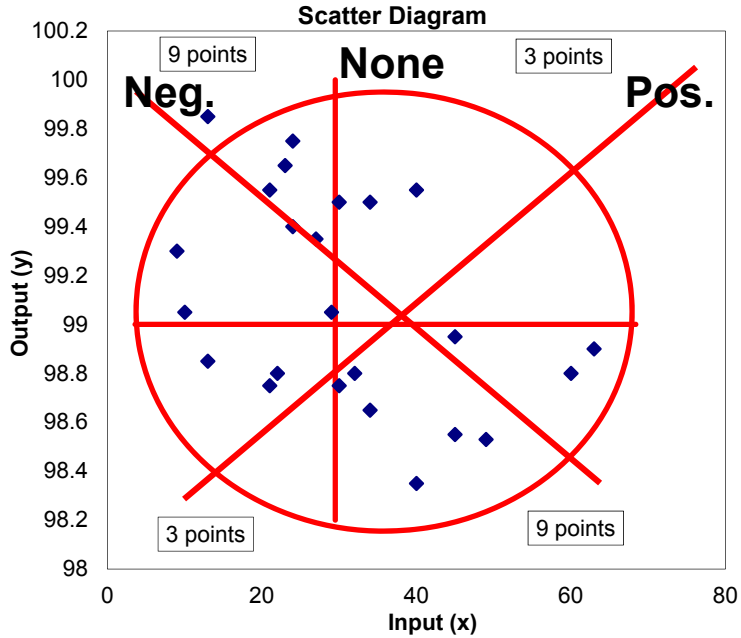
Why use?

- Graphs pairs of numerical data, with one variable on each axis, to look for a relationship between them



How?

- Collect pairs of data
- Graph Ind. Var. on horz. Axis
- Graph Dep. Var. on vert. Axis
- Look for patters



What?

- Independent and Dependent

Variables

Stratification

Why use?

- See patterns from data gathered from a variety of sources

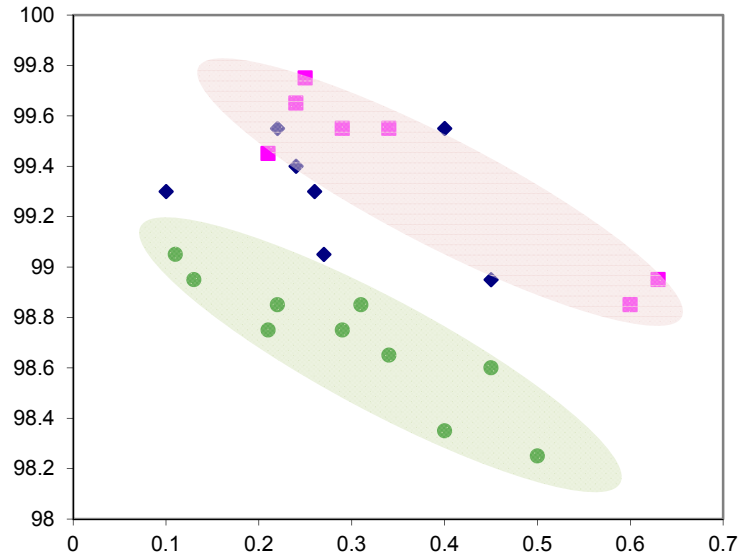
How?

- Consider sources/factors, use diff. markings for diff. sources
- Plot data and look for groupings or differences

What?

- Data with different effects

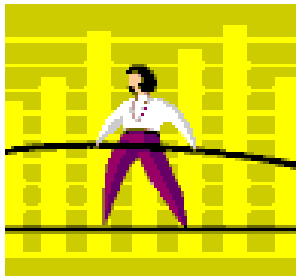
Ex. – locations, shifts, environmental customers, etc.



Value of Graphs

- Graphs are visual pictures of the data
- They have been shown to stimulate more discussion & assist in forming consensus regarding the data presented
- Graphs are a tool for sharing information
- They can assist in determining the need for more data and/or possible interventions

Guidelines for Using Graphs



- Label the axes (X= time) , (Y= events); Title the graph
- State the population (N=2000) or sample size (n=200)
- Understand when to use which measure of central tendency (Mean, Median &/or Mode). State what measure is used.
- Run charts depict processes, their variation & the effect of changes better than bar charts

Graphing Guidelines Continued…

- When multiple graphs with similar data are on the same page, use the same x and y axis range for each graph if possible. Different axes ranges can distort the visual interpretation of the data.
- Using 3-D graphs can distort the visual interpretation of the data based on the space each bar covers and they are more difficult to read accurately

Q & A