

Quality At Any Cost?

Total Quality Management?

**Which is
more
important?**

Return on Quality?

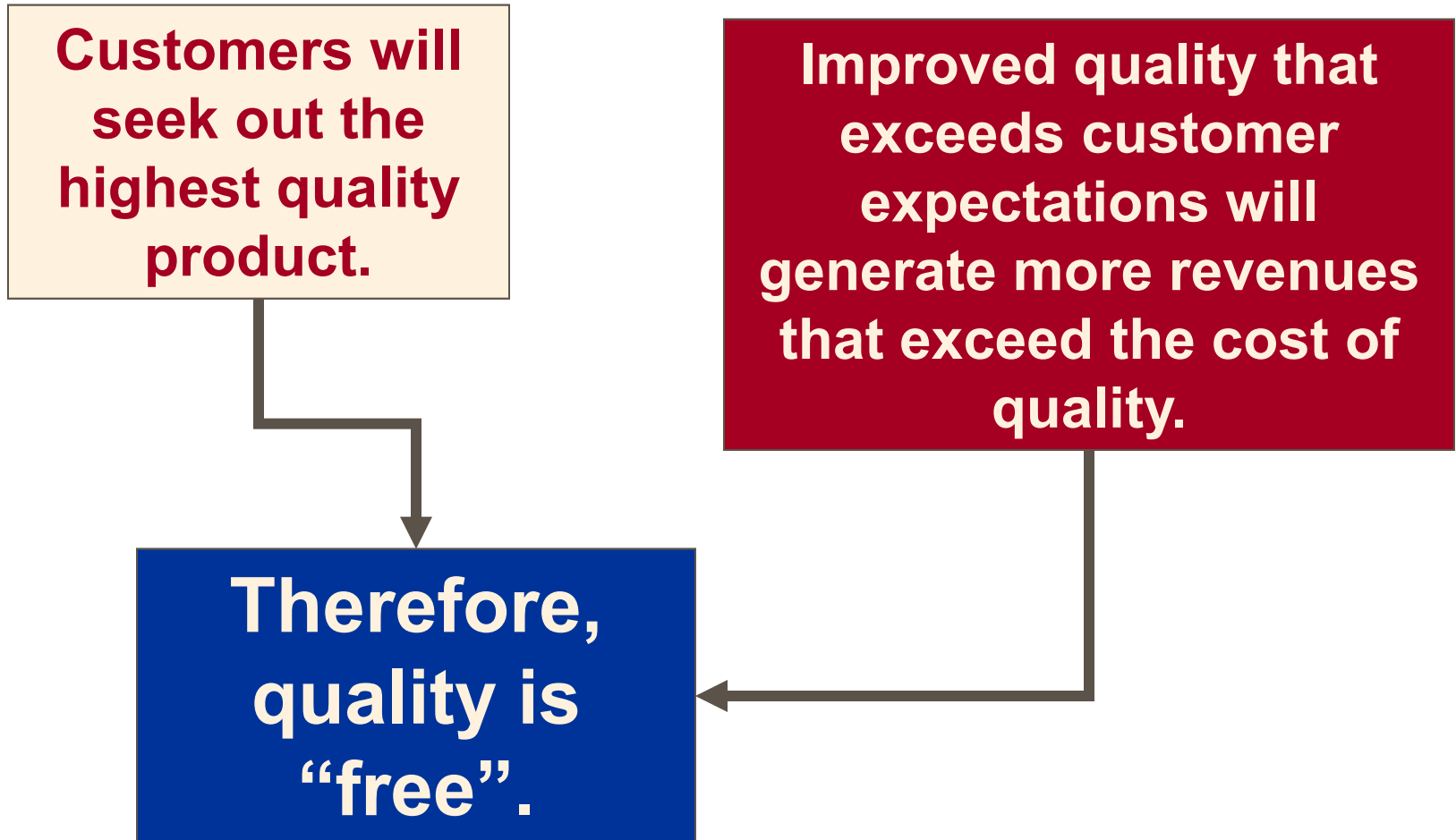


Total Quality Management (TQM)

Customers will seek out the highest quality product.

Improved quality that exceeds customer expectations will generate more revenues that exceed the cost of quality.

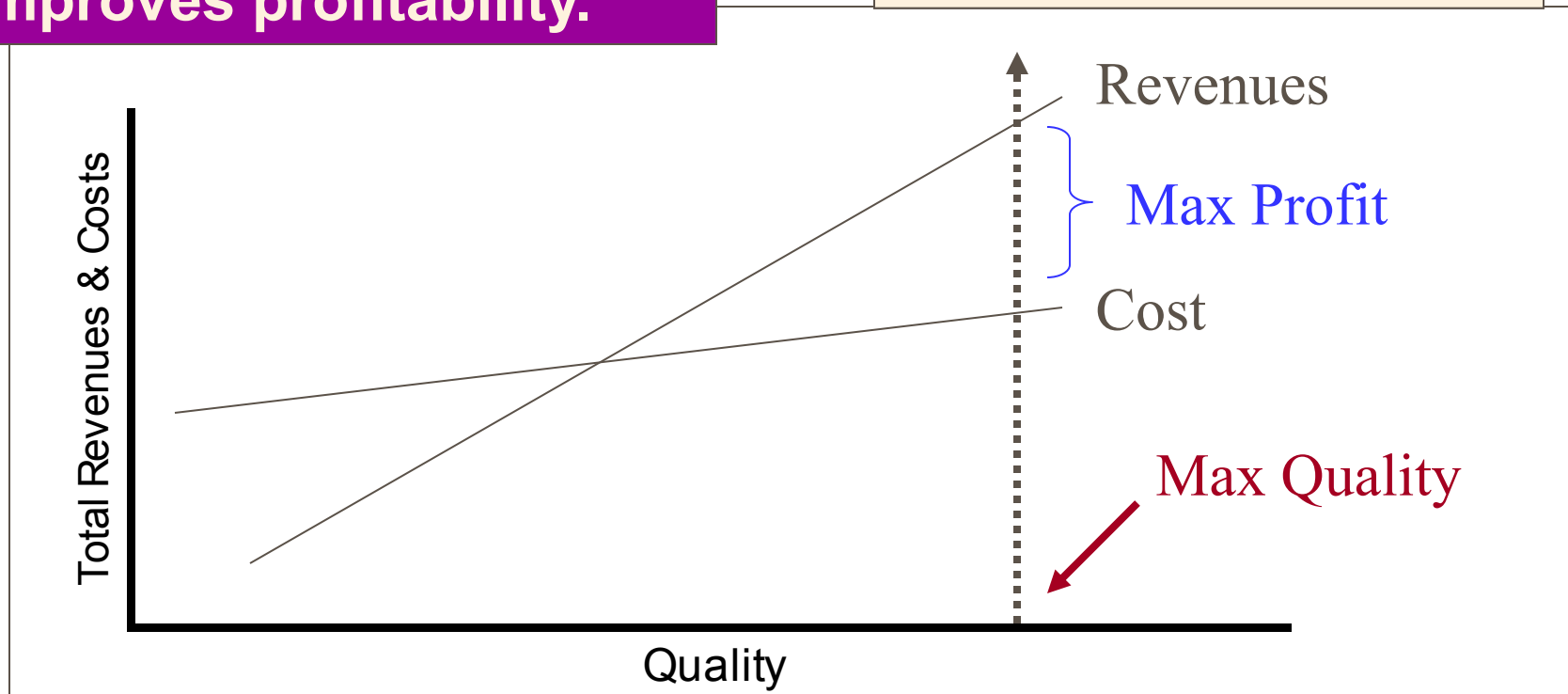
Therefore, quality is “free”.



Total Quality Management (TQM)

W. Edwards Deming proposed that improving quality reduces cost and improves profitability.

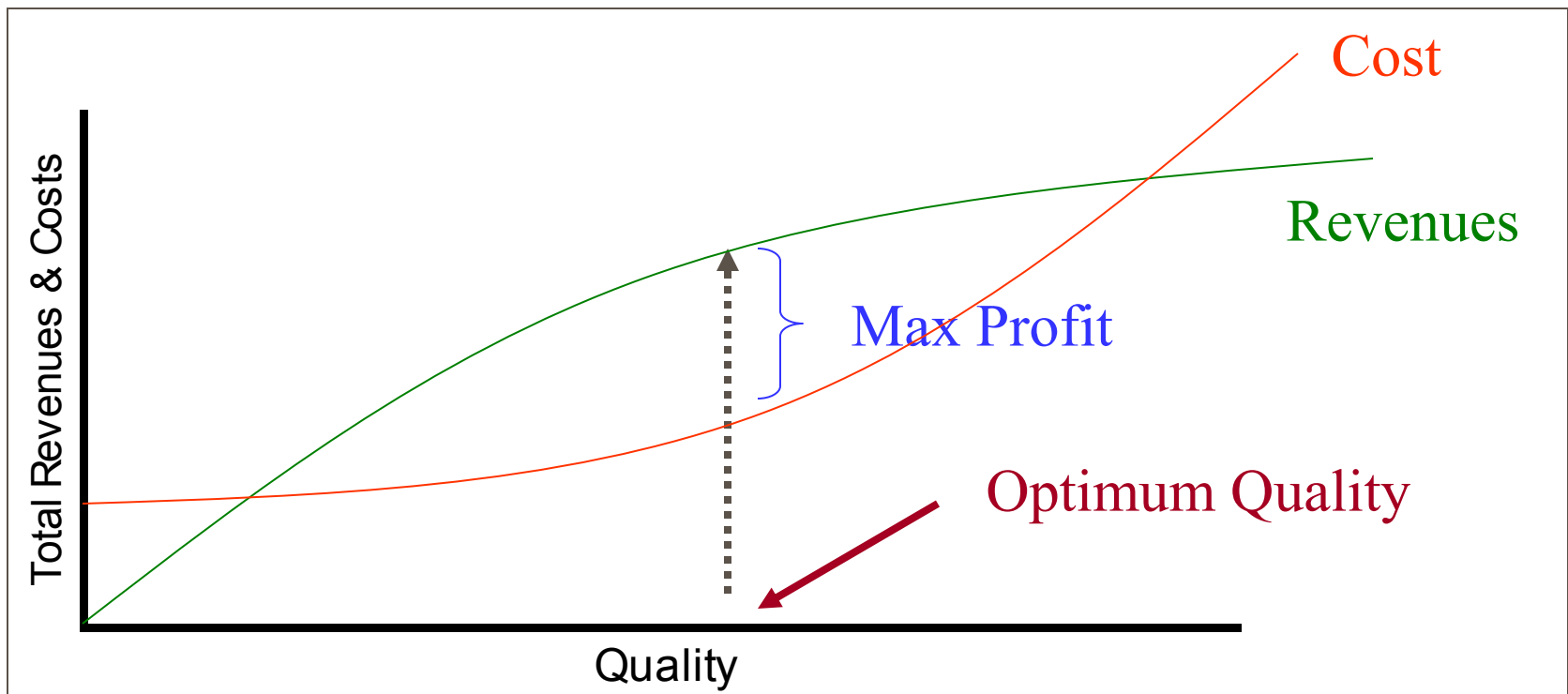
Quality can be and should be improved continuously.



Return on Quality (ROQ)

Profit is maximized at the optimum quality level.

The optimum quality level is always achieved before maximum attainable profit is reached.



Lead Indicators of Quality

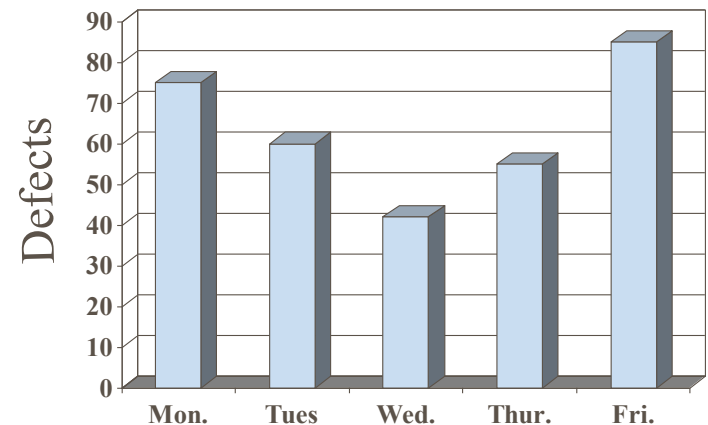
Variation indicates poor quality. To measure variation, there are several tools that can be used:

Histograms

Run Charts

Control Charts

A graphical display of the frequency distribution of attributes.



Lead Indicators of Quality

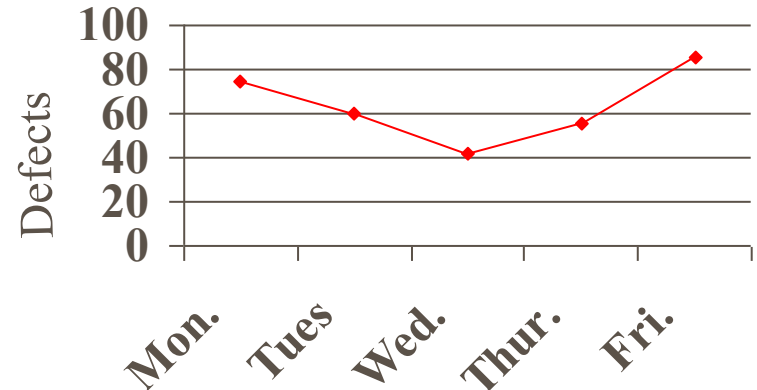
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Histograms

Run Charts

Control Charts

A graph showing trends in variation over time.



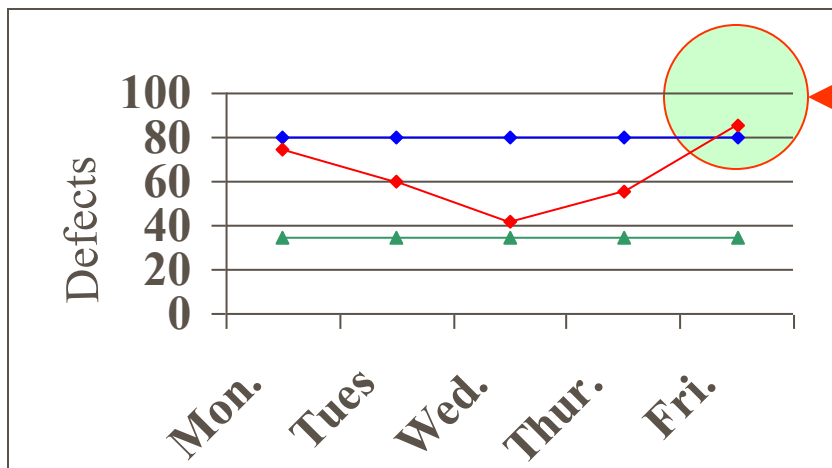
Lead Indicators of Quality

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Notice that this process seems to be out of control on Fridays.

Diagnostic Information

While lead indicators tell that there IS a problem, diagnostic tools help determine WHAT the problem is.

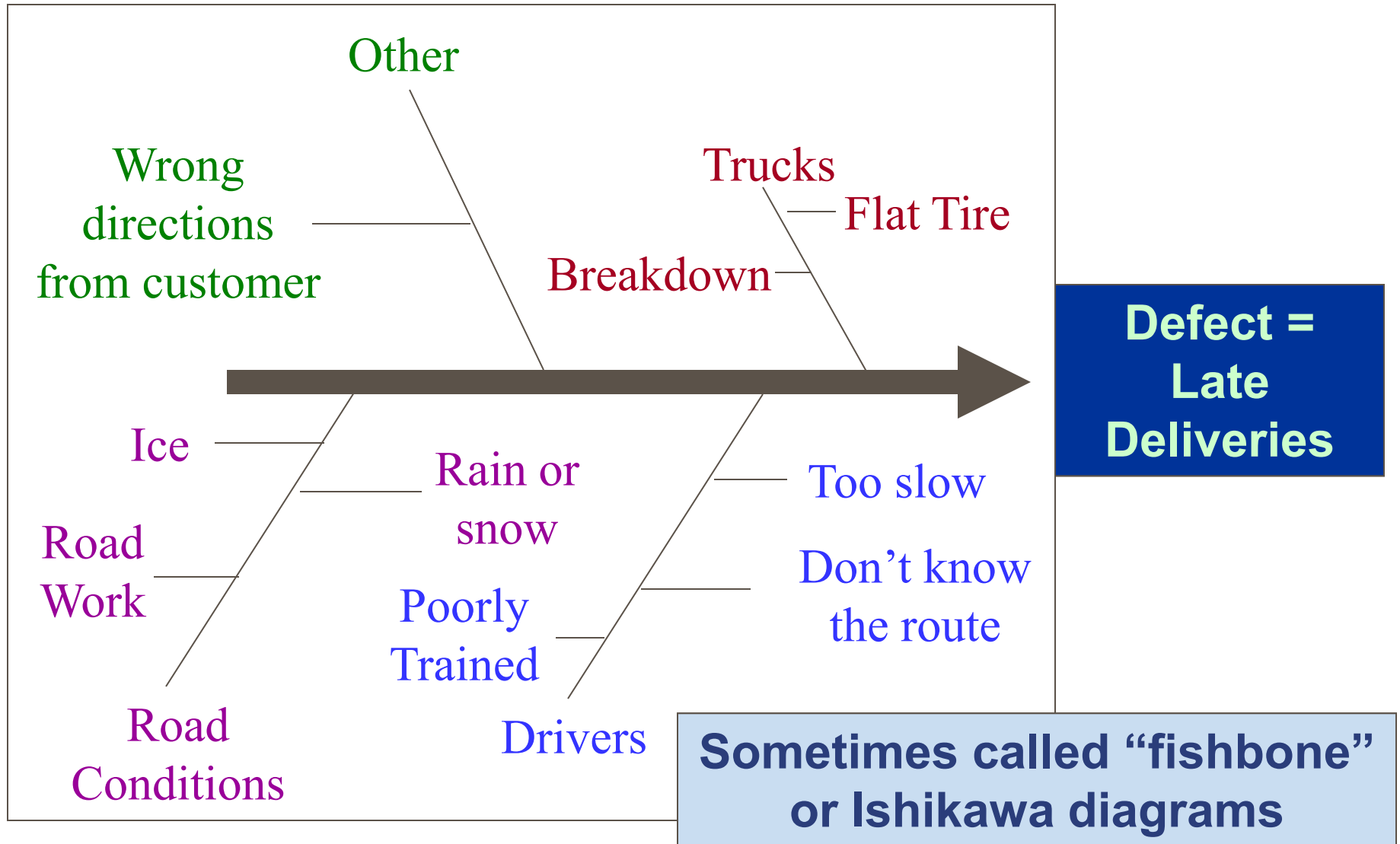
Cause-and-
Effect Diagrams

Scatter
Diagrams

Flow Charts

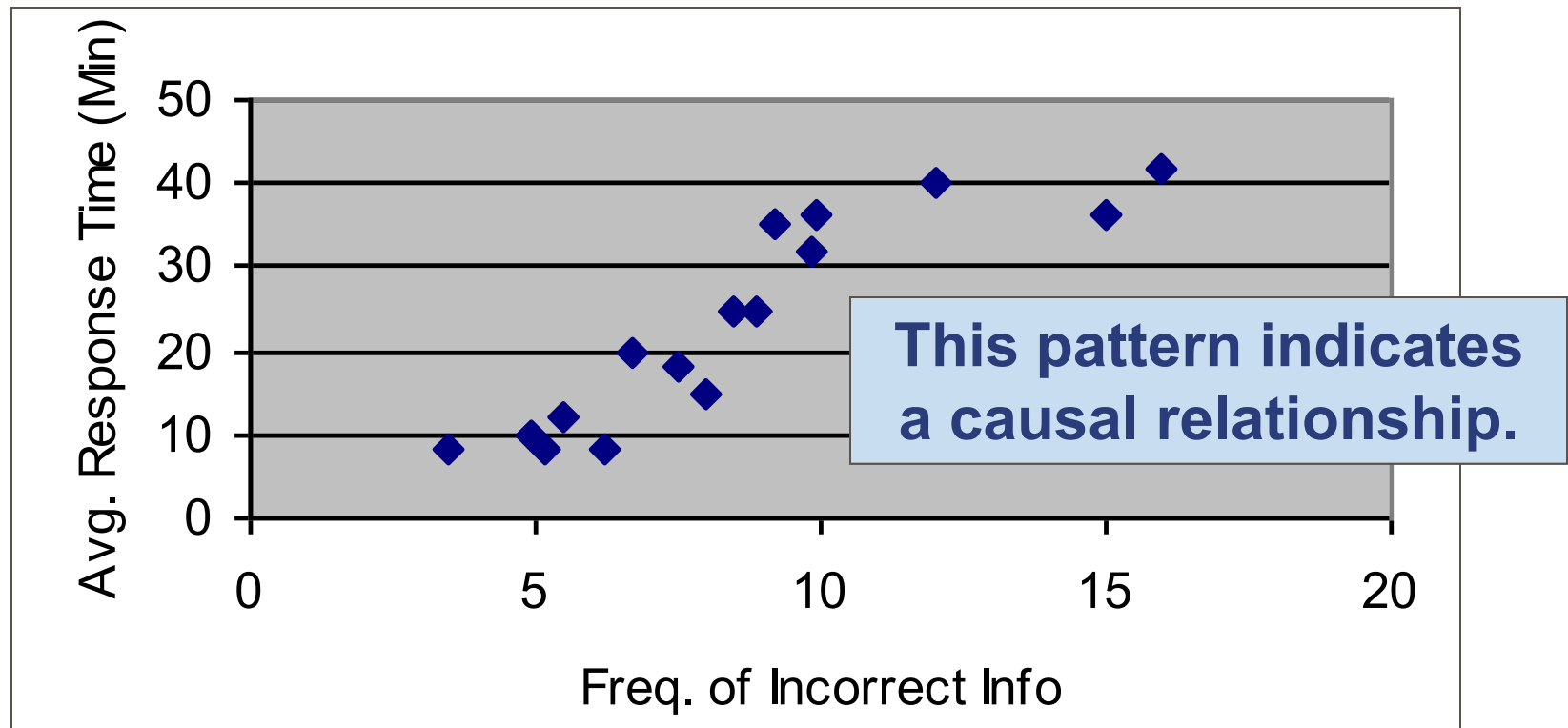
Pareto Charts

Cause-and-Effect Diagrams



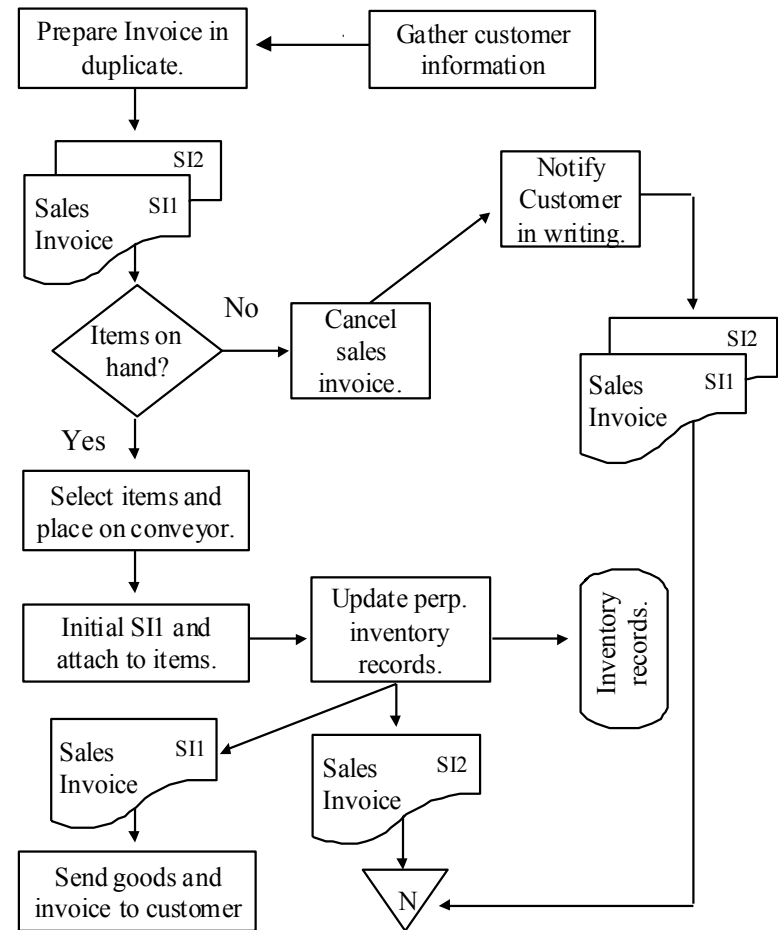
Scatter Diagrams

A plot of two variables that might be related. A Pattern often indicates a causal relationship.



Flowcharts

Taking Phone Orders

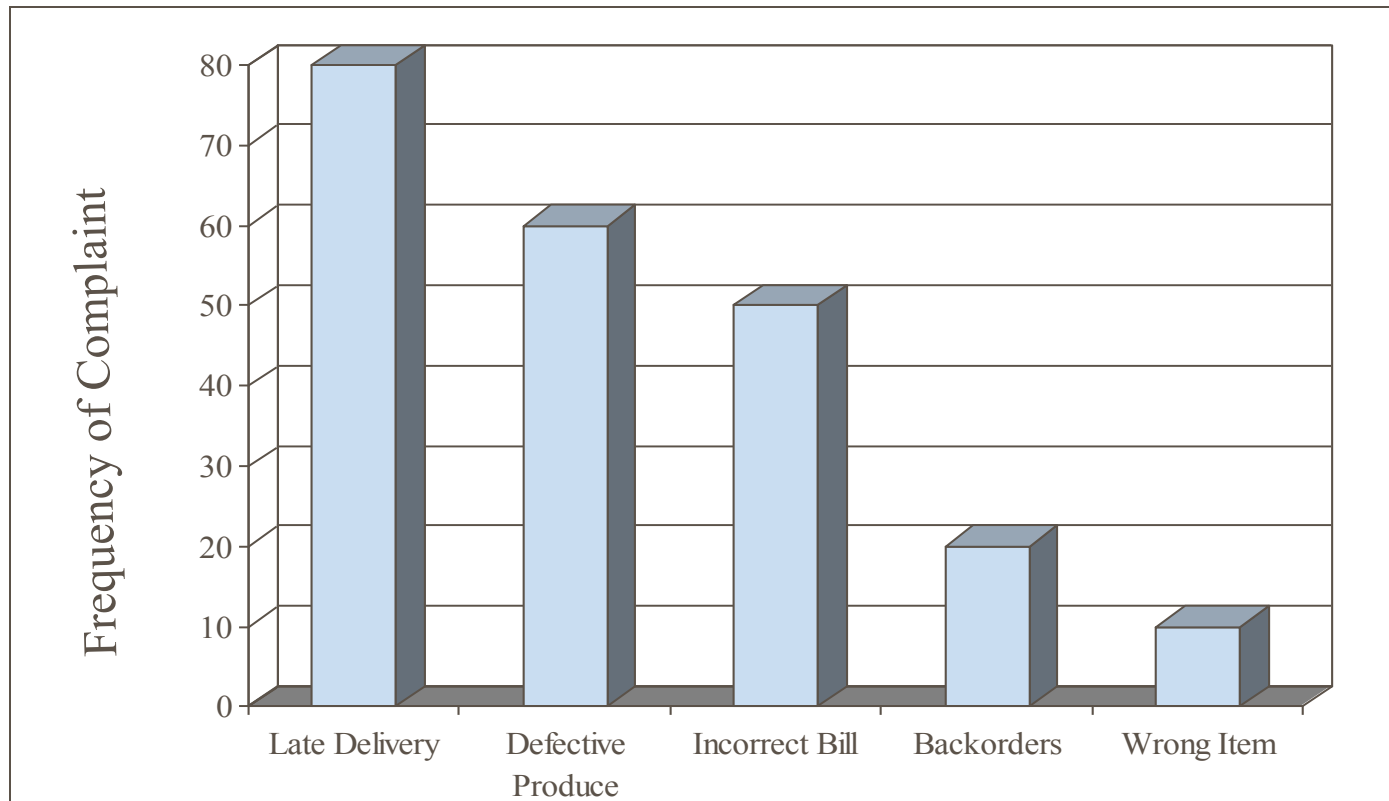


A graphical illustration of sequential linkages among process activities.

Standardized symbols are used to represent decisions, actions, documents, and storage devices.

Pareto Charts

A histogram of causes of errors or errors arranged in order of frequency or size. Helps in prioritizing actions to address problems.



Customer Satisfaction

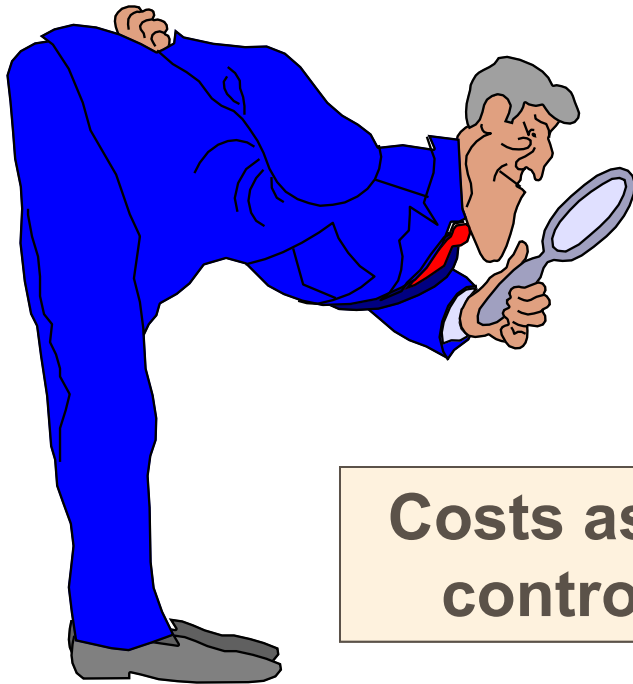
The degree to which expectations of product attributes, customer service, and price have been met or exceeded.

Common tools for measuring customer satisfaction

- Phone Surveys
- Questionnaires
- Focus Groups
- # of Customer Complaints
- “Phantom” Shoppers

Cost of Quality (COQ)

Out-of-pocket costs associated with quality generally fall into two categories:



Costs associated with controlling quality.

Costs associated with activities to correct failure to control quality.

Cost to Control Quality

Prevention

Activities that seek to prevent defects in the products or services being produced.

- *Certifying Suppliers*
 - *Designing for Manufacturability*
 - *Quality Training*
 - *Quality Evaluations*
- *Process Improvements*

Appraisal

Activities for inspecting inputs and attributes of individual units of product and service.

- *Inspecting Materials*
- *Inspecting Machines*
- *Inspecting Processes*
 - *Statistical Process Control*
- *Sampling and Testing*

Costs of Failing to Control Quality

Internal Failure

Costs associated with defects in processes and products that are found prior to delivery to customers.

- *Disposing of Scrap*
- *Rework*
- *Reinspecting/Retesting*
- *Delaying Processes*

External Failure

Costs associated with defects in processes and products that are detected after delivery to customers.

- *Warranty Repairs*
- *Field Replacements*
- *Product Liability*
- *Restoring reputation*
- *Lost Sales*