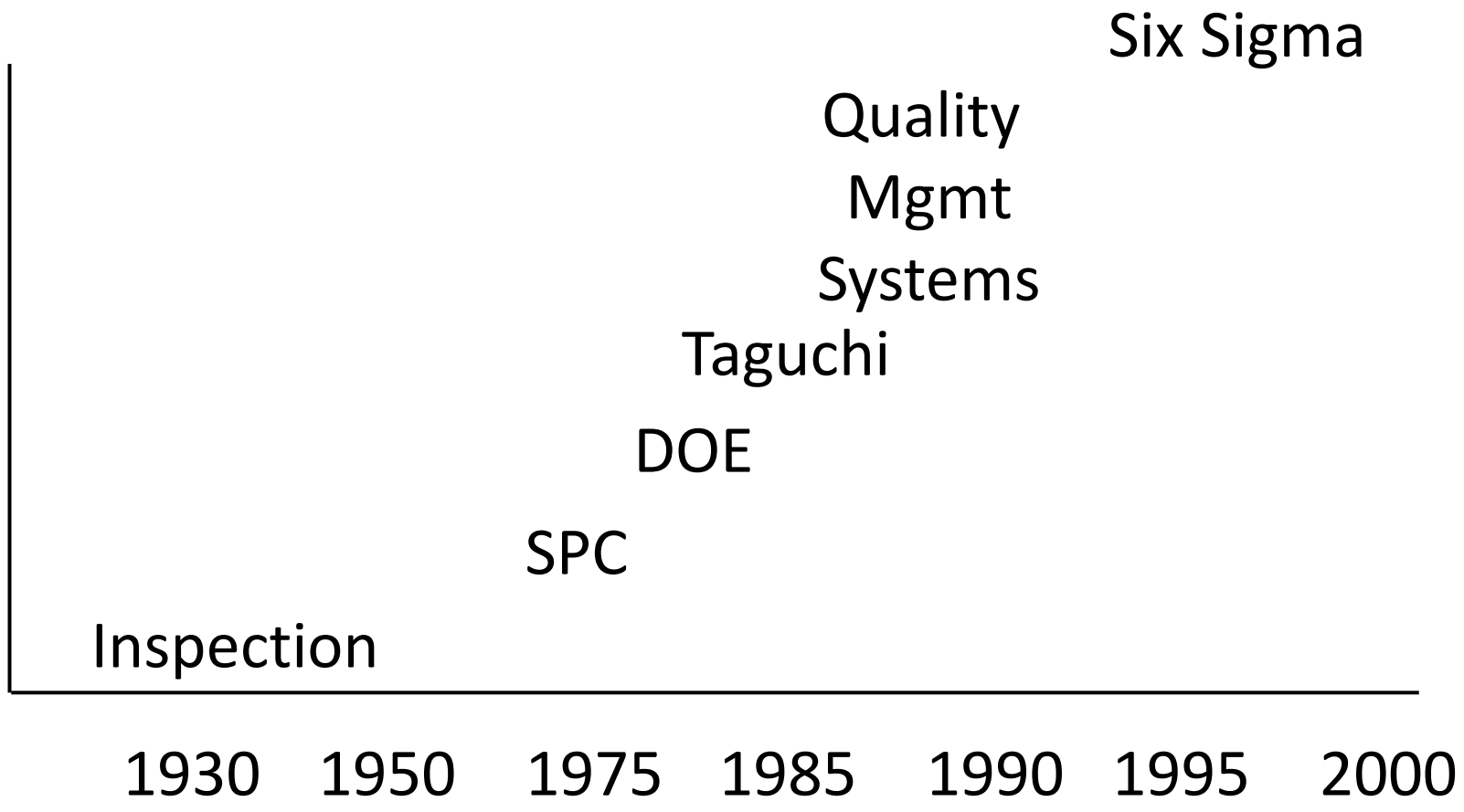
Quality Management Systems – An Overview

TQM
ISO 9000
QS 9000

Lecture Objectives

Total Quality Management defined
Cost of Quality
ISO 9000 and QS 9000
Tools of TQM

Evolution of Quality Management



What does the term Quality really mean?

Quality is the ability of a product or service to consistently meet or exceed customer expectations

Historical Summary

Artisanship
- Closeness of producer and consumer
- One person/common purpose among tasks

Industrial revolution
- Long supply chains
- Unskilled labour
- Mass production
- Uniform quality
- Loss of understanding of purpose

Eli Whitney and Henry Ford

Consumerism a response

Quality has emerged now as a business strategy

Total Quality Management

What does total mean?
Entire organization;
All products and processes;
All aspects (management, design, control)

Not a flavor of the month (i.e. typical management fad) –

Long-term perspectives,
Consider the Japanese

The Quality Challenge

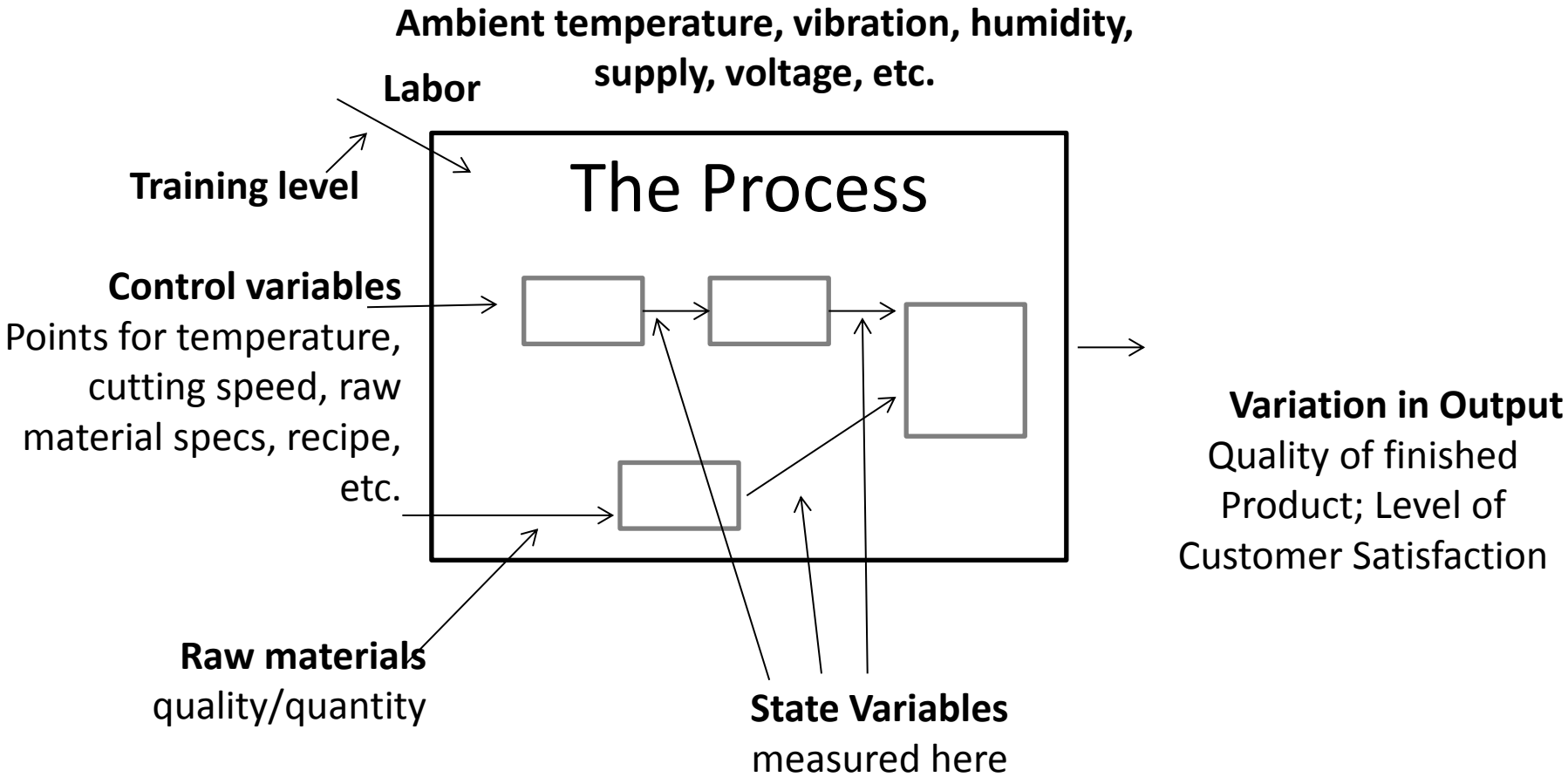
Today's economic reality: Intense global competition for sales, profits, contracts and jobs.

Competition equally challenging in manufacturing and service organisations.

Emphasis on controlling people has not worked.

The emerging strategy: Augment TQM with Six Sigma

Why is quality so difficult to deliver?



Traditional Management

Focus on short-term profits, stock price

No clear strategic position in target sectors (poor competitive positioning)

Clamping down on costs while tolerating high levels of waste

Take-it-or-leave-it attitude to customers

Buying at lowest price

Managers are troubleshooter

These practices hurt rather than help (Edward Deming)

Quality Management

Customer satisfaction is today's Engine for Growth

QM: Assessing, recognizing and meeting the true requirements (needs and expectations) of the customer.

To win customer over, we must delight the customer by fully meeting these needs and expectations.

Quality Gurus

- Edward Deming
  - Plan – Do – Check – Act
  - Fourteen Points for Transformation Management
- J. M. Juran
  - Managerial Practices, Training, Cost of Quality
- Armand Feigenbaum
  - Total Quality Control
- Kaoru Ishikawa
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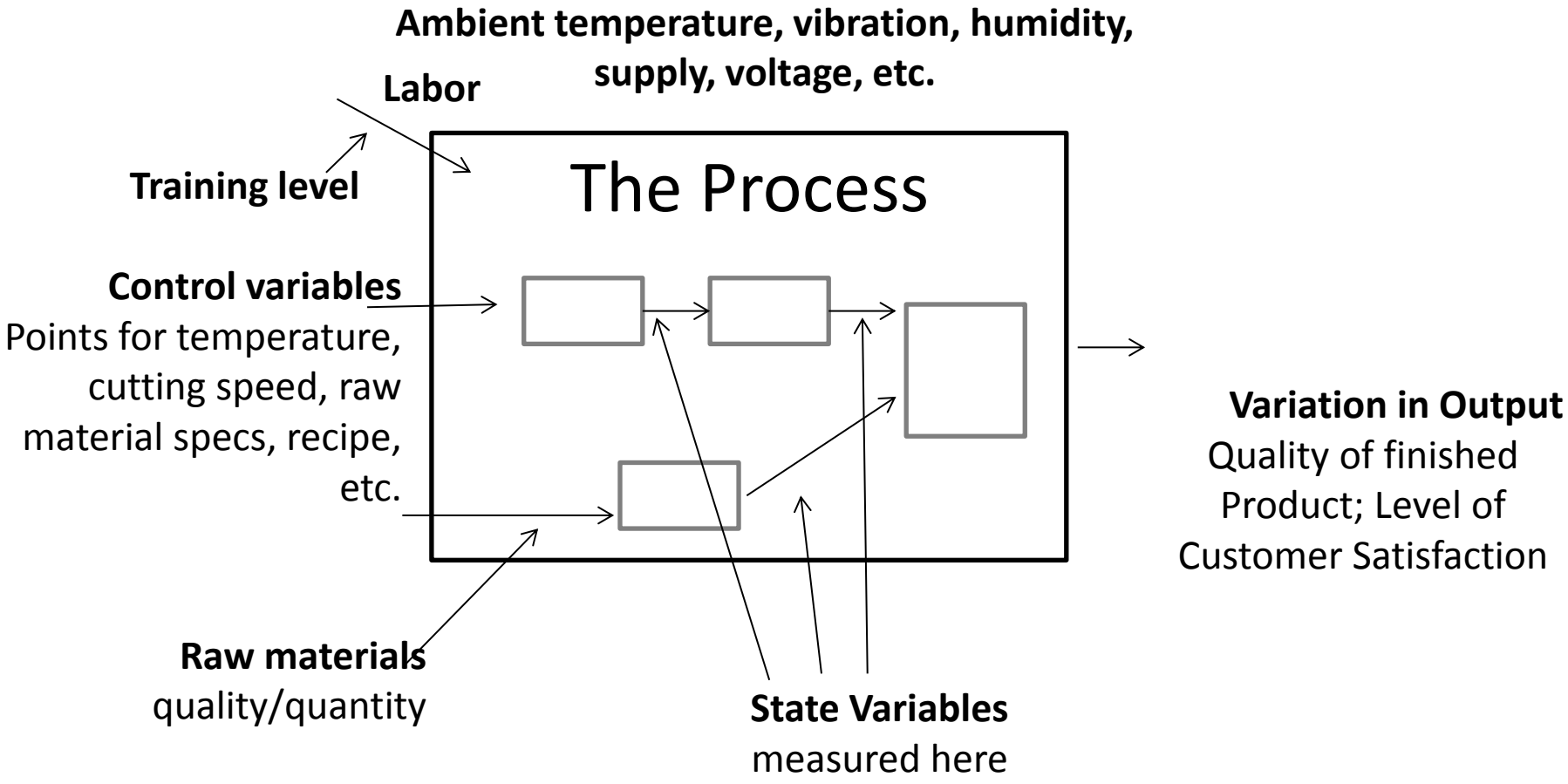


Current Situation Worldwide

- More competitors than ever
- Fiercely competitive strategies in play
- Fluid and unpredictable financial systems
- Customers' expectations increasing
- Employees' expectations increasing
- Investors expect more
- Rapid changes in technology

What customers look for

- Performance – main characteristics of the product/service
- Aesthetics – appearance, feel, smell, taste etc.
- Special features – extra characteristics
- Conformance – how well product/service conforms to customer's expectations
- Safety – Risk of injury
- Reliability – Consistency of performance

What customers look for (contd.)

- Durability – useful life of the product/service
- Perceived quality – indirect evaluation of quality (e.g. reputation)
- Service after sale – handling of customer complaints or checking on customer satisfaction

Contemporary Quality Philosophies and Management Strategies

- Total Quality Management
- Quality Standards and Registration (ISO 9000, QS 9000)
- Just-in-Time, Lean manufacturing, Poka-Yoke etc
- Six Sigma Black Belt Program

Customer Acceptance Criteria: Now it is the *total experience*

Criteria		Product Automobile	Service Auto Repair
Performance	.1	Everything works, fit & finish	All work done, at agreed price
		Ride, handing, grade of materials used	Friendliness, courtesy. Competency, quickness
Aesthetics	.2	Interior design, soft touch	Clean work/waiting area
Special features, Convenience High tech	.3	Gauge/control placement Cellular phone, CD player	Location, call when ready Computer diagnostics
Safety	.4	Antilock brakes, airbags	Separate waiting area

Customer Acceptance Criteria: Now it is the *total experience*

Criteria		Product Automobile	Service Auto Repair
Reliability	.5	Infrequency of breakdowns	Work done correctly, ready when promised
Durability	.6	Useful life in miles, resistance To rust & corrosion	Work holds up over time
Perceived quality	.7	Top-rated car	Award-winning service department
Service after sale	.8	Handling of complaints and/or requests for information	Handing of complaints

Consequences of Poor Quality

Loss of business – Poor design or defective products

Liability – Damage or injuries resulting from faulty design

Productivity – Productivity and quality are often closely related

Costs – Poor quality increases certain costs incurred by the organization

Cost of Mismanaging Quality is Enormous—it can set the stage for improvement

- 15-30% manufacturing sales revenue goes in
  - Failing to satisfy customer's needs and expectations
  - Not doing it right the first time – re-work and returns
- Up to 40% service effort goes in extra work to fix problems
- Mismanagement pushes away new customers
- Intangible losses are not quantifiable

Visible and Hidden Costs of Poor Quality

Visible Costs: Scrap, Rework, Warranty defects

Hidden Costs: Conversion efficiency of materials; Inadequate resource utilization; Excessive use of materials; Cost of redesign and re-inspection; Cost of resolving customer problems; Lost customers/Goodwill; High inventory

Responsibility for Quality by TQM

- Top management
- Design
- Procurement
- Production/operations
- Quality assurance
- Packaging and shipping
- Marketing and sales
- Customer service

Quality Management Systems

- TQM – A culture not a program
- ISO 9000 is a set of guidelines for managing all quality-related activities
- Six Sigma – The latest entry, powerful and heavy on techniques and results; It is a business process

TQM

- Top management's direct involvement
- Strong customer orientation
- Systematic problem solving
- Companywide participation
- Continuous improvement is the theme

But !! Quantification of incentives is missing in TQM; Six Sigma is the extended QA paradigm

Commitment to Quality is easy to detect

It shows on the shop floor, in hospital wards, in classrooms, in customer interaction …

Things happen:

- Material problems are corrected with suppliers
- Equipment faults are put right by improved maintenance programs or replacement
- People are trained
- Partnerships are built
- Continuous improvement is observable
- Business grows

A QM System enables Competitive Positioning

Must decide first how you want to compete:

- Low price or differentiation
- Target market broad or niche marketing
- Assess strength of buyers, suppliers, competition

Determine how the value added will be distributed among suppliers, you and your customers

TQM starts with identifying needs and expectations of targeted potential customers

Getting Started to Impact Quality

Recognize customers; Discover their needs and expectations

Set performance standards that meet customer requirements

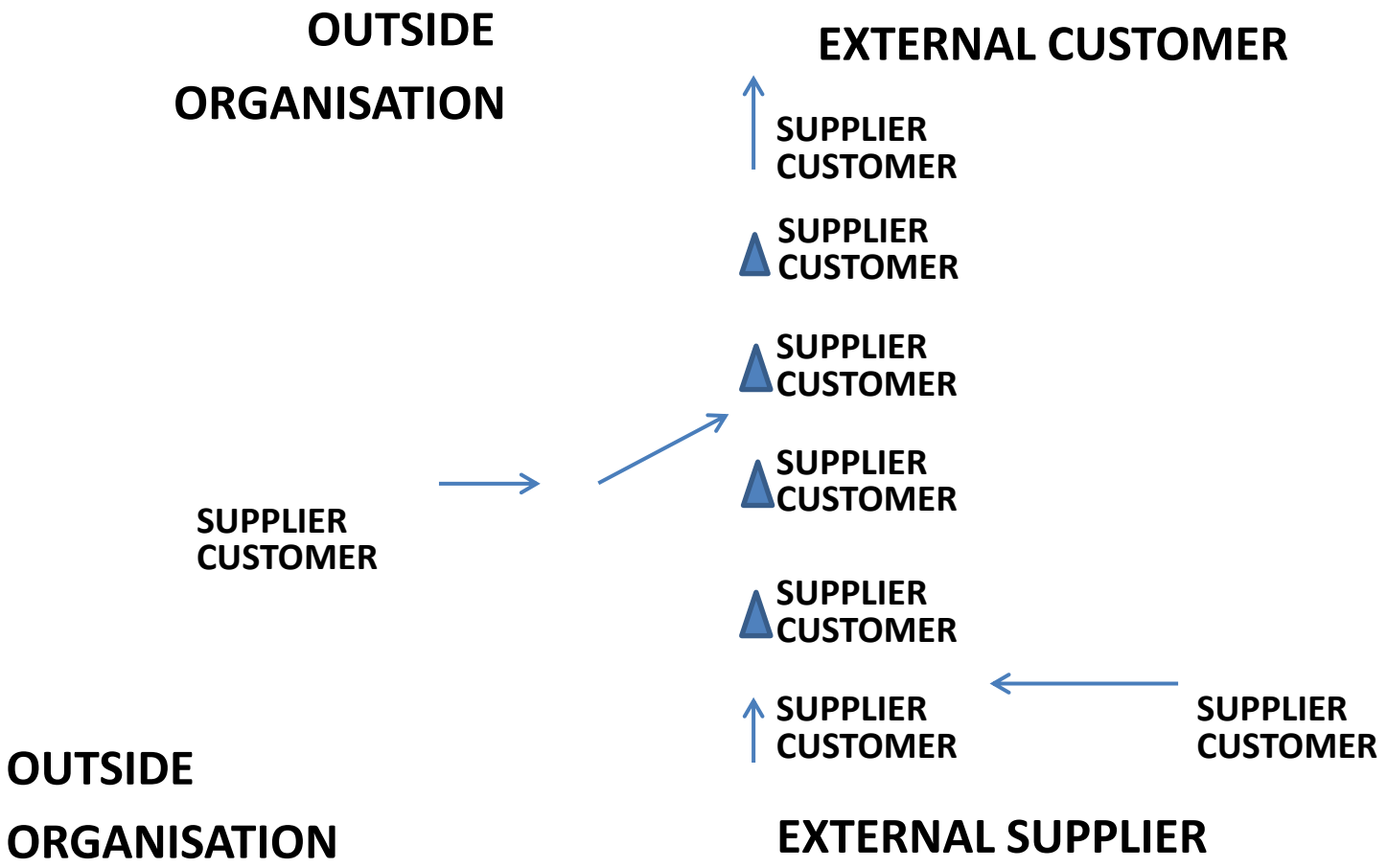
Control processes and improve their capability

Establish quality management systems

Set quality policy, motivate through leadership and equip people to achieve results

Empower everyone to act for quality improvement

The Quality Chain



Internal Suppliers are key links in the chain

Who are my internal suppliers?

What are my true requirements to do my job right?

How do I communicate my requirements?

Do my suppliers have the capability to measure and meet my requirements?

How do I inform them of changes in the requirements?

Locating Quality Problems (where do you begin?)

- Customer complaints, Warrantees
- Benchmarking
- 7 Tools Training
- House of Quality (QFD)
- Taguchi Experiments
- Continuous improvement programs
- Plan/Do/Check/Act

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Deming's crucial observations

- Lack of constancy of purpose (flavor-or-the-month);
- Emphasis on short-term profits;
- Performance evaluations (e.g. MBO);
- Executive mobility;
- Emphasis of visible figures alone;
- Excessive medical costs;
- Excessive warranty costs (fueled by lawyers)

Deming's "Other Obstalces"

- Neglect of long-range planning;
- Search for examples;
- Belief that technology alone will transform industry;
- Believing problems to be different;
- Obsolescence in schools;
- Reliance on QC departments;
- Meeting specifications;
- False starts (quality circles, lip service);
- Unmanned computers

The Malcom Baldrige National Quality Award

1.0 Leadership (125 points)

2.0 Strategic Planning (85 points)

3.0 Customer and Market Focus (85 points)

4.0 Information and Analysis (85 points)

5.0 Human Resource Focus (85 points)

6.0 Process Management (85 points)

7.0 Business Results (450 points)

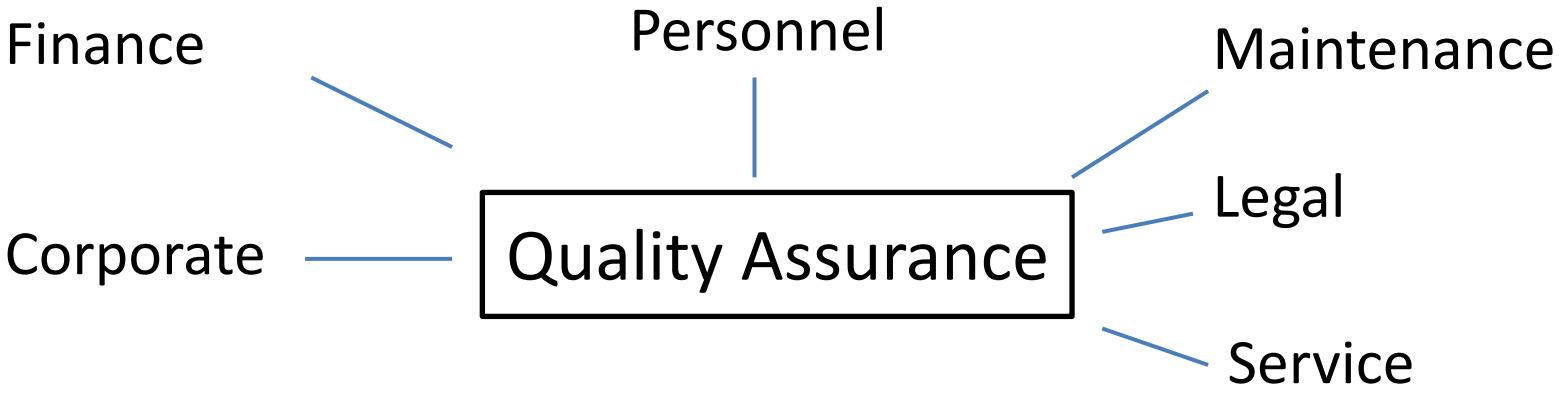
The Deming Prize

- Honoring W. Edwards Deming
- Japan's highly coveted award
- Main focus on statistical quality control

TQM

TQM is a way to create a customer-focused organization

Whole lot of internal customers are there



Quality Engineering

Product Design
Process Design
Procurement

Quality Control

Manufacturing
Packaging
Distribution
Field Service

Two modes of Quality Control

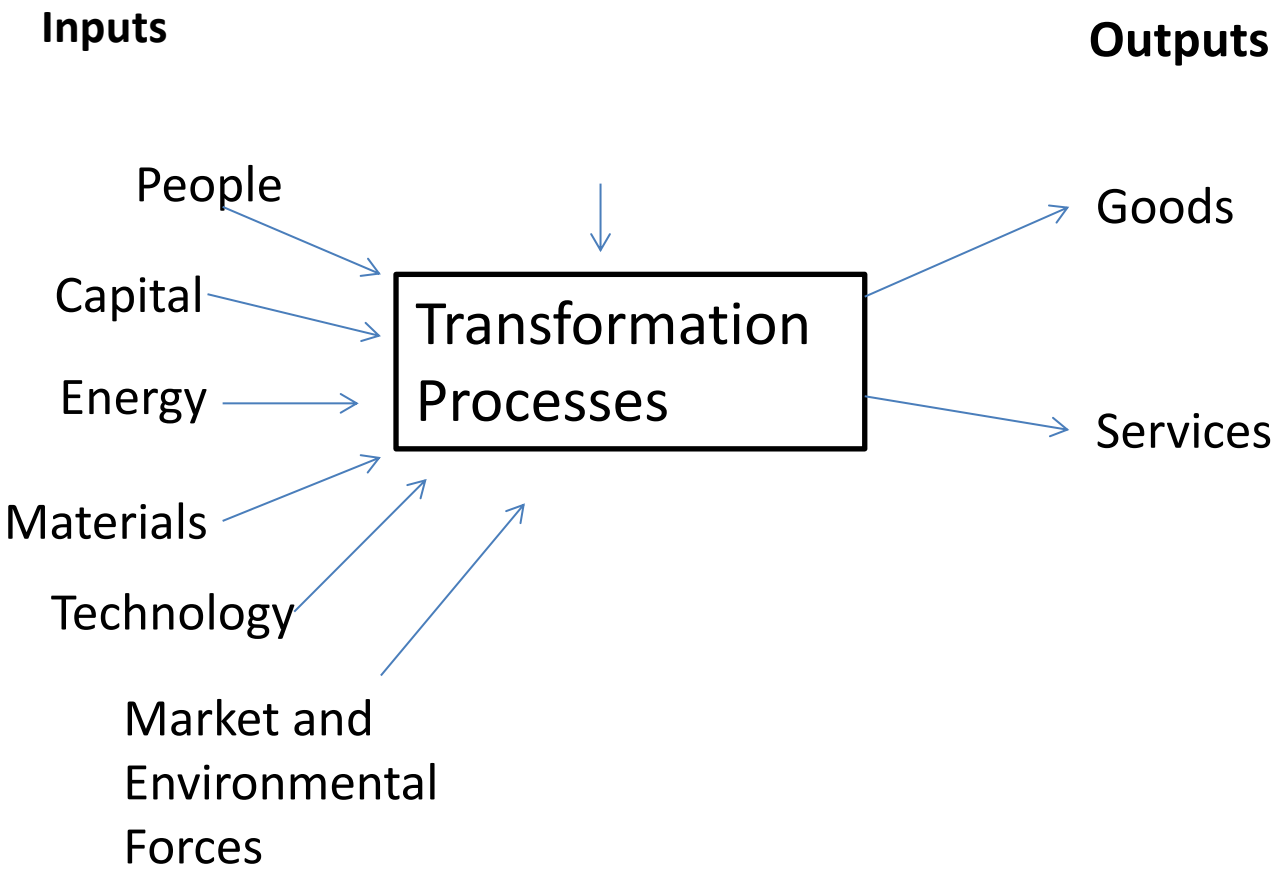
Detection Mode:

- Heavy use of inspection
- Manufacturing and QC are adversaries
- Firefighting; Management by crisis;
- High costs
- Lost sales
- Loss of competitive position

Prevention Mode:

- Very little inspection;
- QC is a resource of Manufacturing –teamwork
- Problem elimination
- Smooth operations – continual improvement
- Decreasing costs
- Increased sales
- More competitive

Operations are a Transformation Process



Managing the Process

Problems:

- Result from series of activities (process);
- Not from single aspect (e.g. supplier);
- Therefore, for each product, entire process needs to be studied for improvement opportunity

Process:

- Recall Input/Process/Output model
- Input components change over time -> Instability

The Process Focus

Operation = Transformation Process

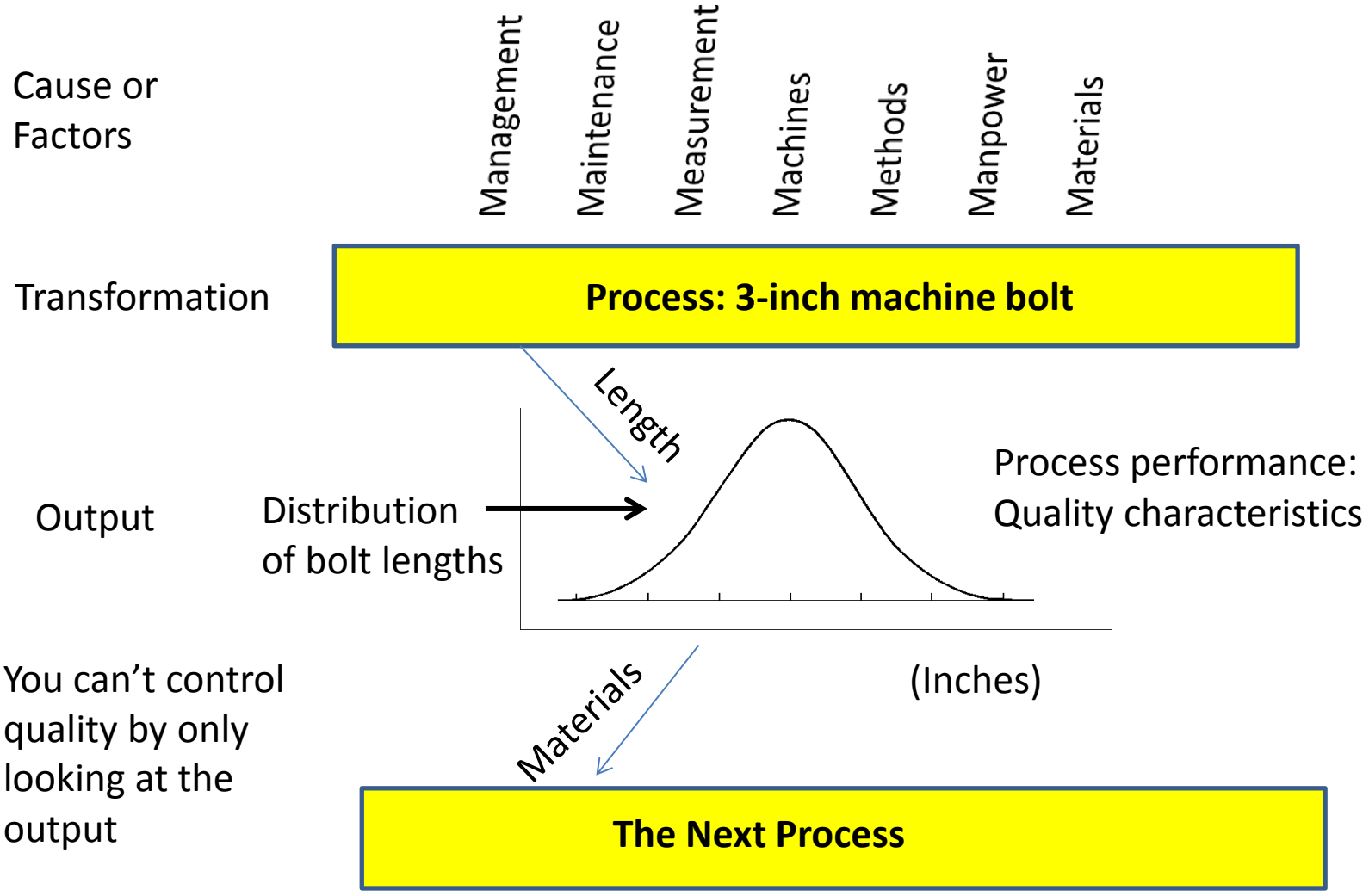
Process inputs (factors that you control):

Management, Methods, Materials, Machines, Maintenance, Personnel, Information, Energy

Transformation: Macro/Micro views

Outputs: Components/Finished goods/Services

The Process Focus: Causes are Contributing Variables



Scientific Method for Process Improvement

1. Identify and define the problem
2. Study the existing situation; Collect necessary data
3. Generate possible solution alternatives
4. Evaluate alternatives and choose the preferred one
5. Implement the improvement and measure results
6. Evaluate and revise if required
7. Otherwise, return to Step 1 and start again with a new problem

Deming's PDCA follows this

Six Sigma DMAIC follows this

Process improvement and Control in a nutshell

Apply the Scientific Method

Incorporate Tools:

- General tools
- Coarse grained tools
- Fine grained tools

Tools for Process Improvement

General Tools: Team-building and group-interaction tools; Specific process/technology tools

Coarse-grained Tools: Process flowchart; Check sheets and histograms; Pareto analysis; Fishbone charts

Fine-grained Tools: Fail-safing (Pokayoke); Design of Experiments (DOE); Scattergrams; Run diagram; Process control chart

Obstacles to Implementing TQM

- Poor intra-organisational communication
- View of quality as a "quick fix"
- Emphasis on short-term financial results
- Internal political and turf wars
- Training/process knowledge

Obstacles to Implementing TQM

Lack of:

- Companywide definition of Quality;
- Strategic plan for change;
- Customer focus;
- Real employee empowerment;
- Time to devote to quality initiatives;
- Leadership;
- Sufficiently strong motivation

Summary

TQM requires:

- Top management's direct involvement
- Strong customer orientation
- Everyone participates – Empowerment
- Systematic problem solving
- Continuous improvement

TQM is a great foundation but TQM does not directly relate to business results.

Six Sigma is the latest quality management innovation. It is a focused method and a philosophy.

Useful links

http://www.mindtools.com/swot.html

SWOT analysis for strategy development

“TQM is a culture not a program.”

South West Airlines

http://www.emeraldinsight.com/journals.htm?articleid=842637

Approaches to Attain Quality

Traditional Approach to Quality:

- Control the quality of the product by inspection
- Acceptable quality levels (AQL)
- Some defects will slip through

World-Class Approach to Quality:

- The product is only the result of the process which makes it
- If the process is correct the product will be good
- No need to inspect

We now augment TQM with other methods to gain efficiency…

Lean production: Borrowed from Japan;

- Quality Circles

Teams: Borrowed from Sweden;

- Use of autonomous work groups;
- Multi-skilled gain sharing

Flexible specialization: Borrowed from Italy;

- Use of flexible technology;
- Job security

Diversified quality production: Borrowed from Germany;

- Combining skills and technology

The Role of Management

Management is an enabler, culture setter, and supporter rather than dictator.

Total quality is also about people:

- New ideas for quality
- Empowerment
- Communication

Initiatives in employee involvement

- Locating decisions at the lowest levels in the organization
- Self-managed teams to form critical part of thinking
- New work structures and new ways of organizing work
- The job of management is to prepare individuals/teams to function in an autonomous manner
- Individuals/teams are given the power, information and knowledge

TQM guides all functions:

TQM – What it involves

Aspects of TQM:

- Quality concepts
- Quality management
- Quality control
- Quality improvement

Deming and others

TQM – What it involves (I)

Doing it right first time

Design quality into the system (and Product):

- Methods
- Equipment
- Training

Prevention is better than detection

TQM – What it involves (II)

Quality is responsibility of management:

Problems are result of the system;

Un-empowered workers have no control over the system

Customer Concept:

Focus, maximize value added;

Types –

External,

Internal - Horizontal, Supervisors, Subordinates

TQM – What it involves (III)

Defects are Treasures – They contain data

Requirements for TQM:

Elements –

- Top down commitment (management integrity)
- Bottom up ideas (cooperative worker attitudes)

Two-way communication is necessary

Employee Empowerment

Other Improvement Tools that deliver performance:

- Just-in-Time (JIT)
- Benchmarking
- Re-engineering
- Supplier Development
- Total Preventive Maintenance (TPM)
- Quick Response Programs
- Team Building

Aspects of TQM (I)

Quality Concepts

What is quality?

Dimensions: Design versus compliance quality

Cost of quality (or lack of quality)

Importance of quality

- Productivity and costs (Deming chain reaction)
- Competitiveness

Aspects of TQM (II)

Quality Management

- Just good management in the first place!
- Addresses the quality of management

Quality Control

- Acceptance sampling
- Processes control

Aspects of TQM (III)

Quality Improvement

Approaches to making things/processes better

Examples:

Taguchi methods, Charts, Histograms, Fishbone diagrams, Other

Primary sources (need two way communication)

- Customers
- Workers

JIT?

TQM and the Deming Philosophy

Deming's 14 Points

- Suggestions/targets (not commandments?)
- Not a menu: Buy all or none!
- "Some organizations are not ready" (?)
- Local employers (empowerment?)
- Universities (grades?)

Deming's 7 Deadly Diseases

Deming's Other Obstacles

What Others Have to Say?

Deming's 14 Points Abbreviated

1. Constancy of purpose
2. New philosophy
3. Price tag awarding of business to suppliers
4. Mass inspection
5. Continuous improvement
6. Training
7. Supervision
8. Fear

Deming's 14 Points Abbreviated

9. Barriers
10. Slogans
11. Quotas
12. Pride in workmanship
- Direct labor
- Management
13. Education
14. Structure

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Other Quality Experts

- Joseph Juran – Cost of quality
- Philip Crosby – Zero defects
- Kaoru Ishikawa – Teams, 7 Tools
- Genichi Taguchi – Loss function, robust design
- Armand Feigenbaum - TQM

Quality and Competitiveness: The links

Value of quality to the company:

Impacts of quality efforts on performance:

- Market share and profitability
- Customer satisfaction
- Quality
- Costs
- Employee relations

Directly related to ROI

Six Sigma programs have proven the value of quality

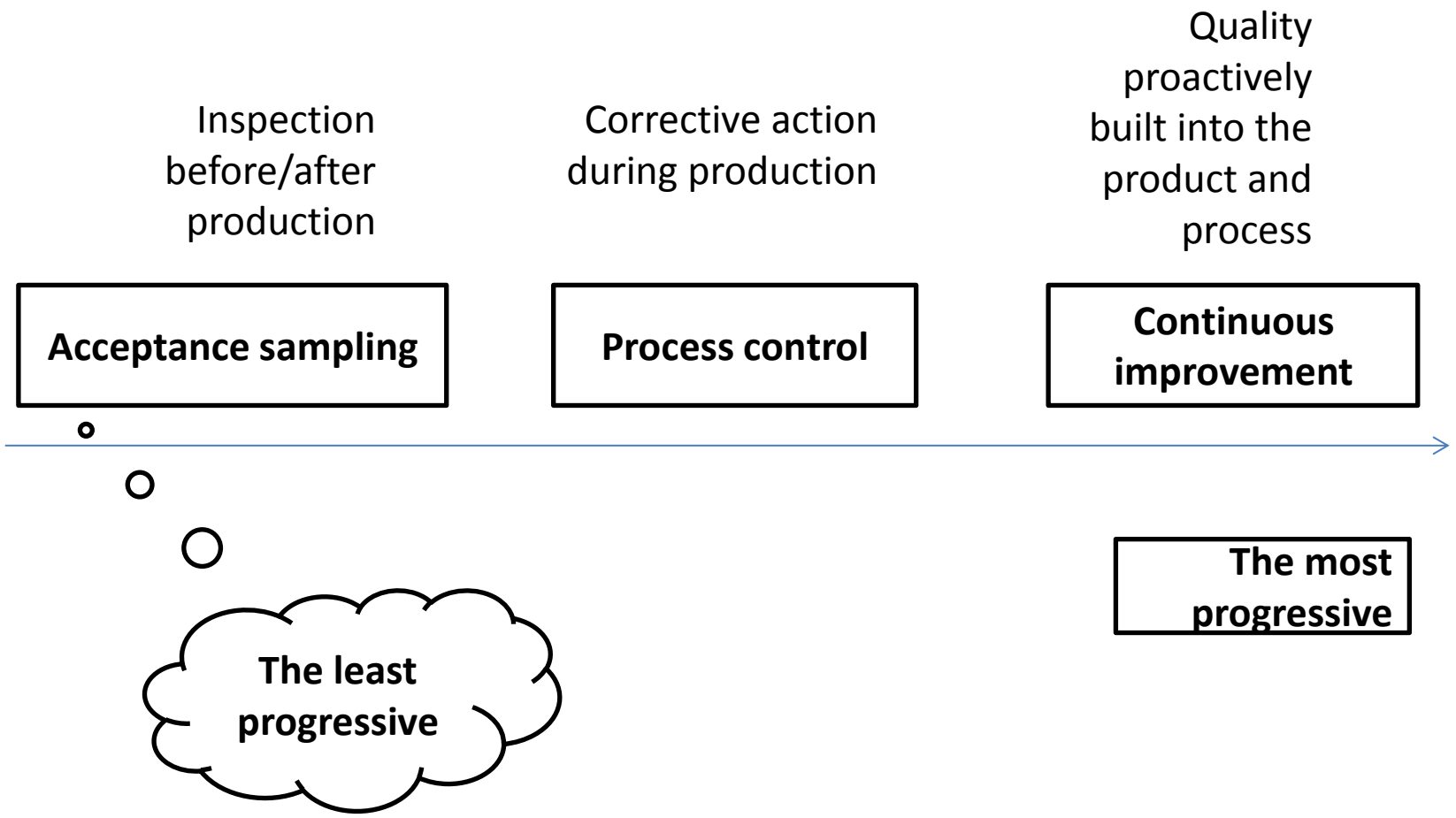
Total Quality Management Principles recalled …

1. Customer-focused Organization
2. Leadership
3. Involvement of People
4. Process Approach
5. System Approach to Management
6. Continual Improvement
7. Factual Approach to Decision Making
8. Mutually Beneficial Supplier Relationships

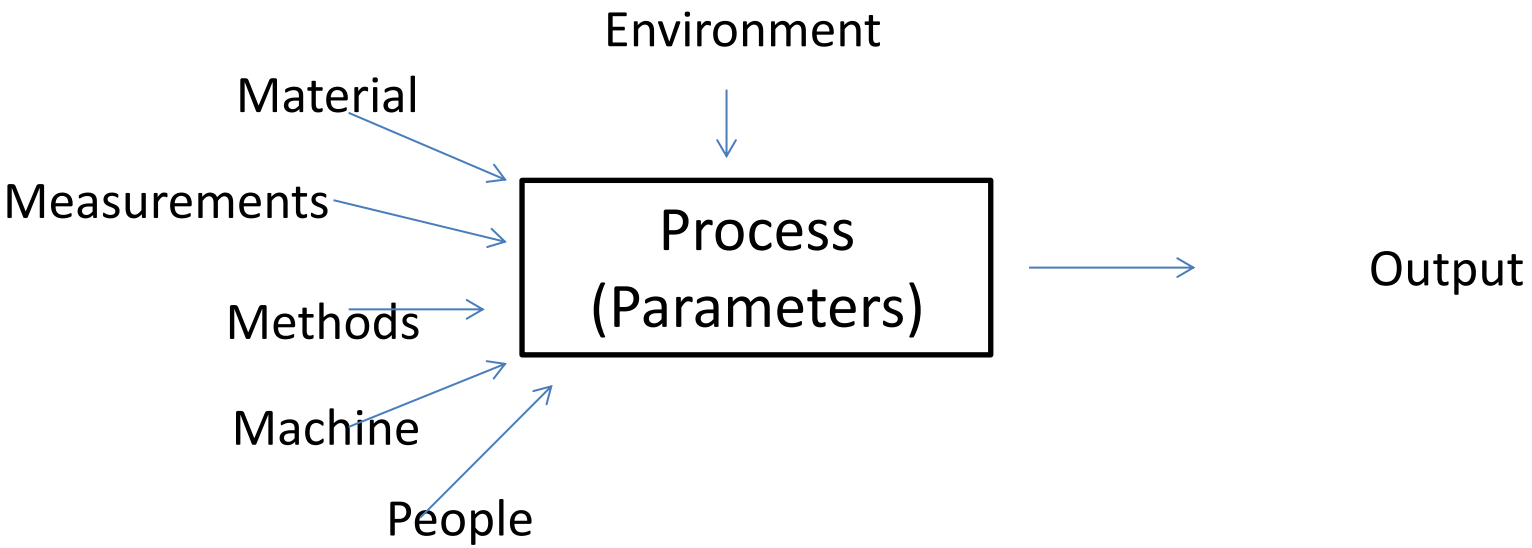
How to tell ‘TQM’

- Top management’s direct involvement
- Strong customer orientation
- Problems solved by systematic methods
- Everyone participates
- Continuous improvement is the theme

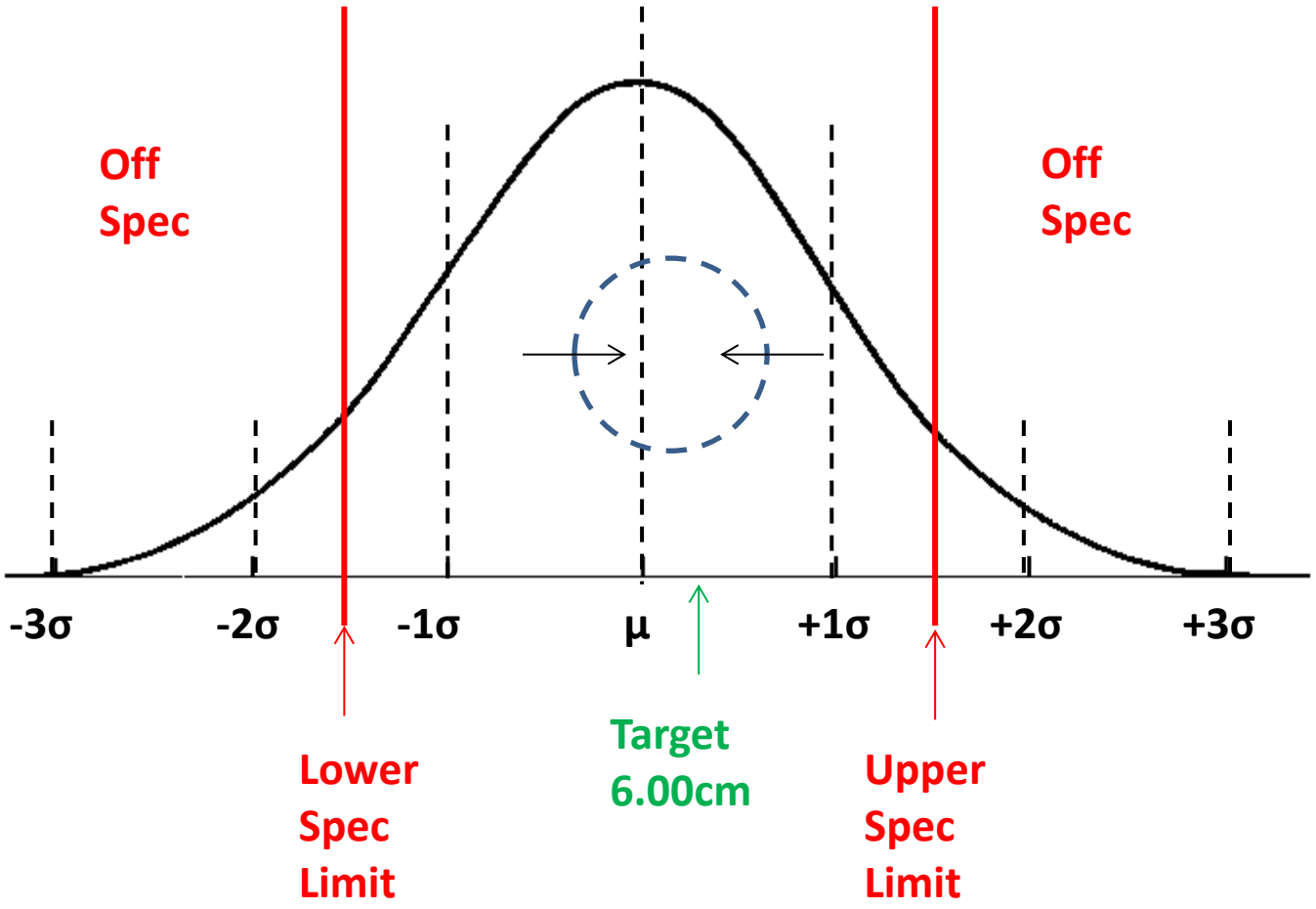
The least to most effective method for Quality Assurance



Moving QC toward QA: Causes and the Effect

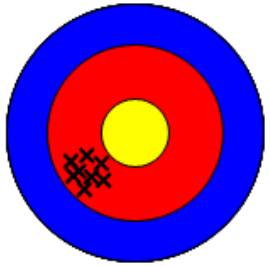
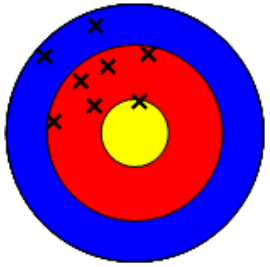


Manufacturing defects: Shaft diameter has two problems



Accuracy and Precision

Engineering characteristics of a product or process may show problems with accuracy or with precision or both

	Accurate	Inaccurate (systematic error)
Precise		
Imprecise (reproducibility error)		

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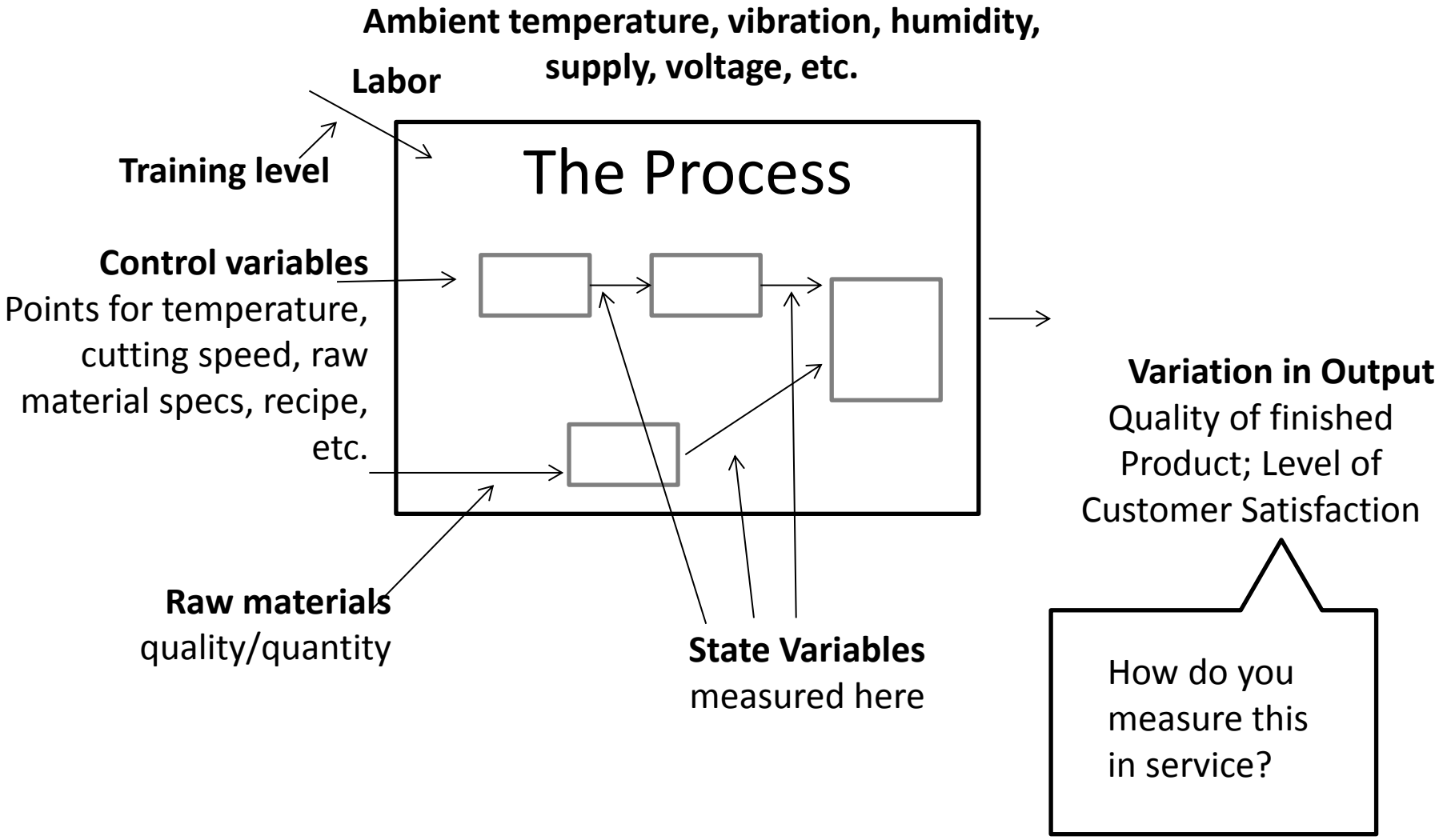


What is Cost of Quality

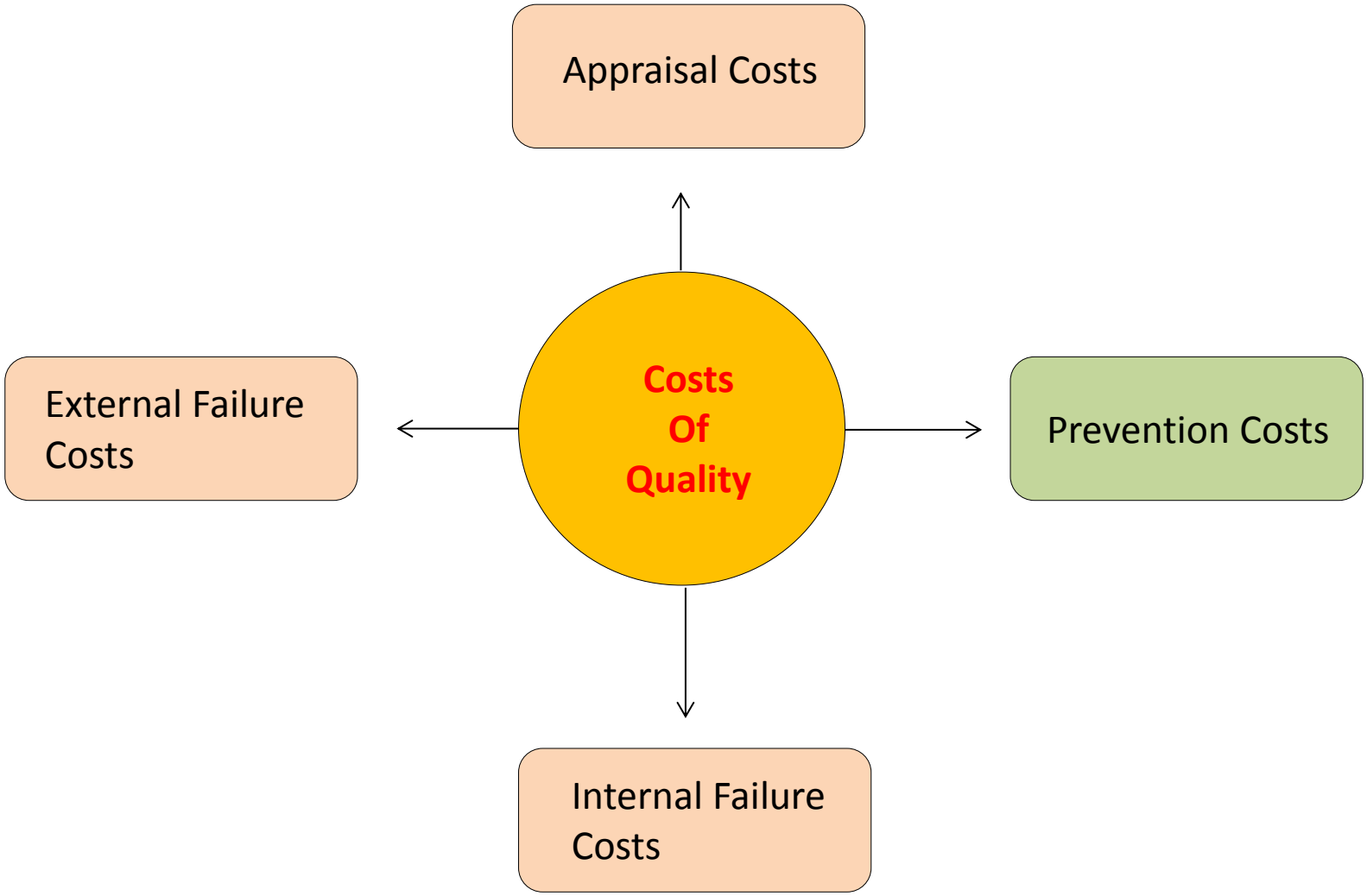
Appraisal

External Failure

Internal Failure

Prevention

Costs of (Poor) Quality



Cost of Poor Quality

Failure Costs – Costs incurred by defective parts/products or faulty services.

Internal Failure Costs – Costs incurred to fix problems that are detected before the product/service is delivered to the customer.

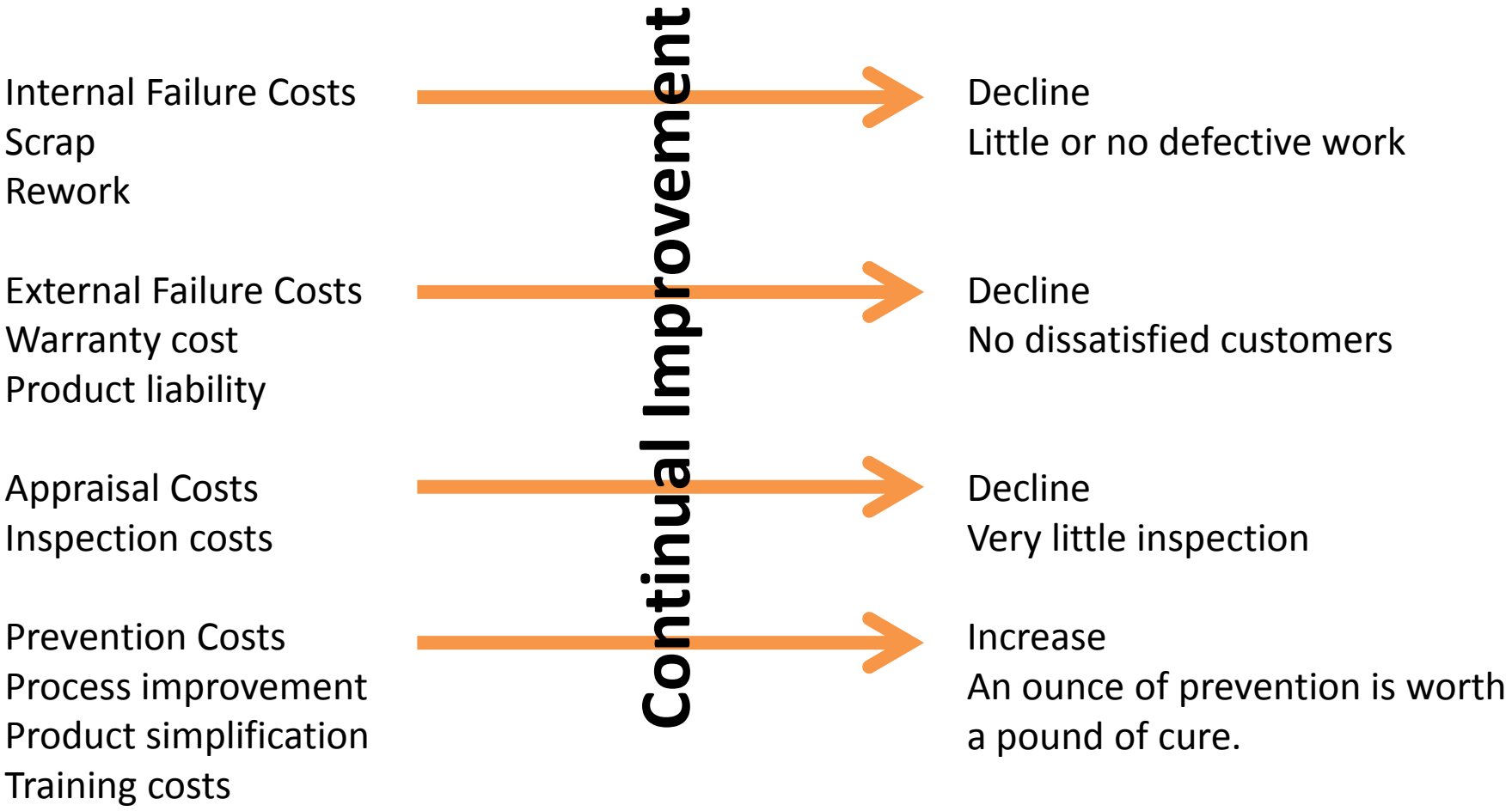
External Failure Costs – All costs incurred to fix problems that are detected after the product/service is delivered to the customer.

Cost of Poor Quality (contd)

Appraisal Costs – All product and/or service inspection costs.

Prevention Costs – All TQ training, TQ planning, customer assessment, process control, and quality improvement costs to prevent defects from occurring.

COQ – Finding the incentive



Cost of Poor Quality

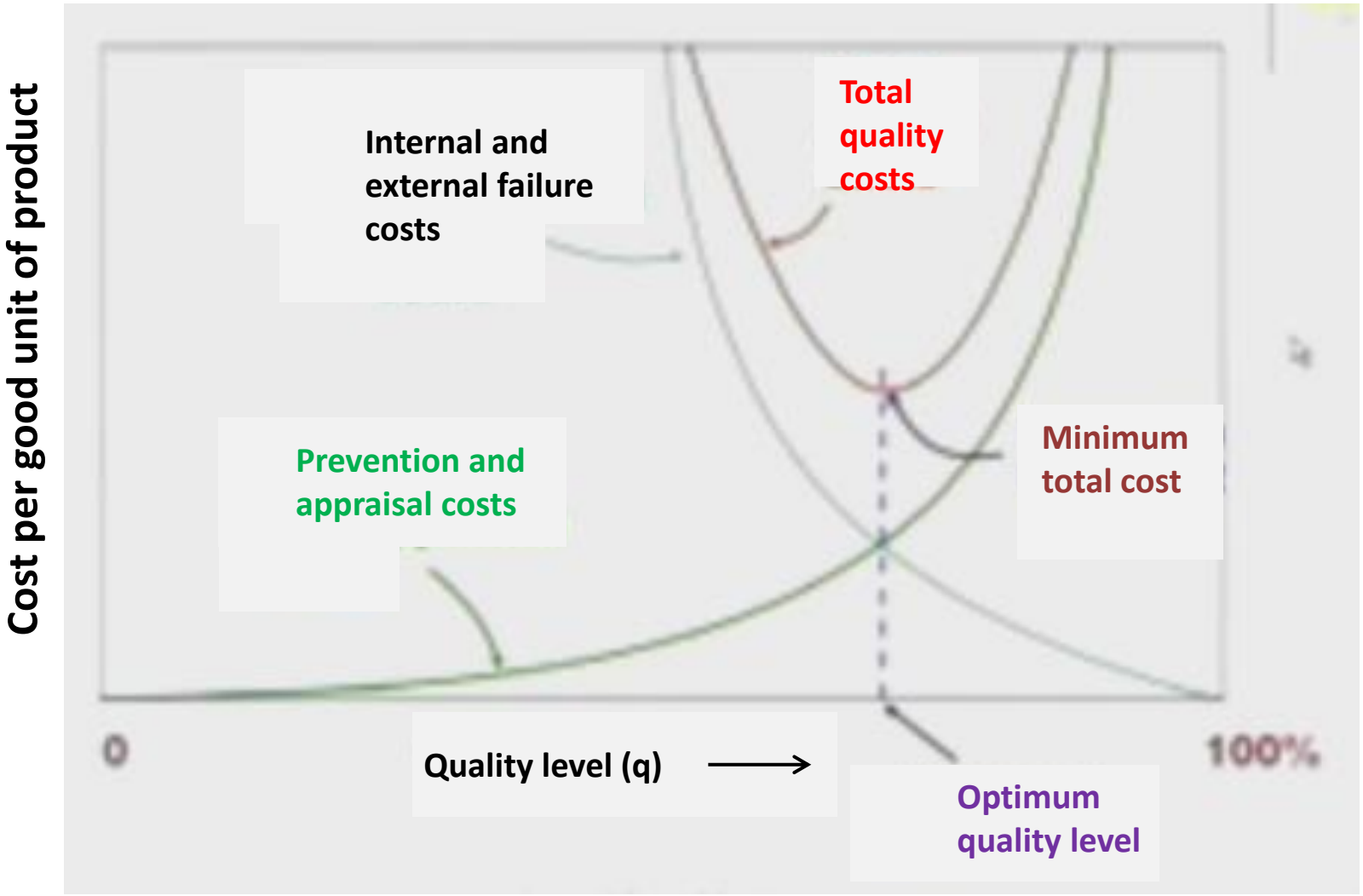
Internal Failure Costs – rework, scrap and other costs of correcting errors before they reach the customer.

External Failure Costs – Warranty repairs, replacements, complaints, legal expenses.

Appraisal Costs – Measuring quality, inspections, test, surveys, etc.

Prevention Costs – Training, redesigns, inspection procedures etc.

Quality Cost: Traditional Outlook



Taguchi's Quality Loss Function

Ethics and Quality

Substandard work

Defective products

Substandard service

Poor designs

Shoddy workmanship

Substandard parts and materials

Having knowledge of this and failing to correct and report it in a timely manner is unethical.

TQM encourages problem solving at all levels

A different management philosophy

Appropriate organizational structure to put this into effect

Use of the simple and advanced statistical tools

Training at all levels

The power to delegate to those who can make the necessary changes

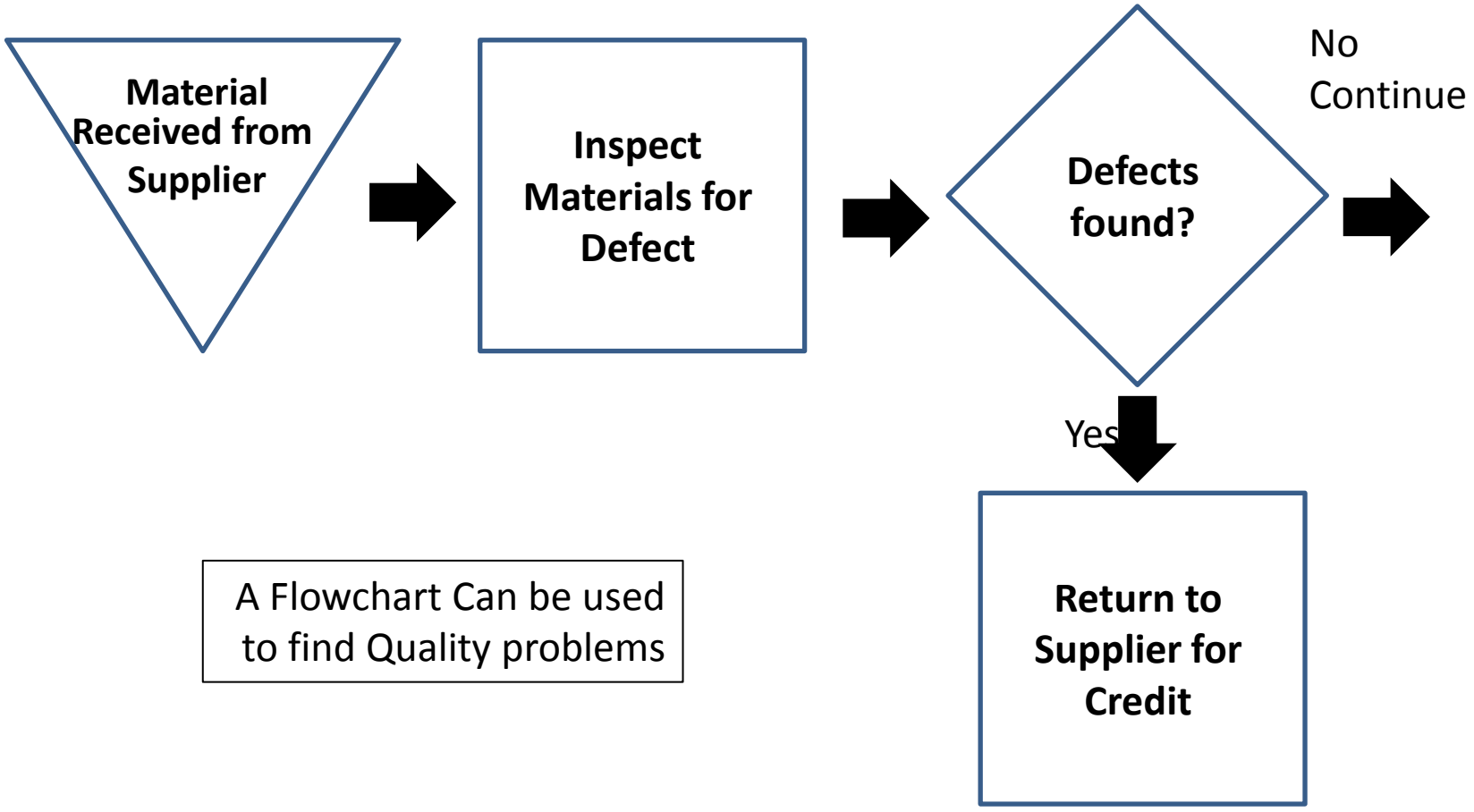
What do Tools and Techniques do?

- Focus on reducing variability from the targeted performance in meeting customer expectations.
- Any process can be monitored and improved by gathering and using its data more effectively.
- Tools and techniques are the enablers.
- Statistical process control (SPC) is an example.
- Design of Experiments (DOE) is a powerful tool in Six Sigma.
- Deming said “Use of statistical tools should spread companywide – to make the best use of the data being generated possible.”
- Before tools and training you will need management commitment to resourcing and strategic support, and good organization.

Basic Quality Tools for TQM and Continuous Improvement

- Flowcharts
- Check sheets
- Histograms
- Pareto charts
- Scatter diagrams
- Control charts
- Cause-and-effect diagrams
- Run charts

Tool # 1 Flow Chart – Map the Process first!



Flowcharts

A flowchart or process map identifies the sequence of activities or the flow of materials and information in a process. Flowcharts help the people involved in the process understand it much better and more objectively by providing a picture of the steps needed to accomplish a task.

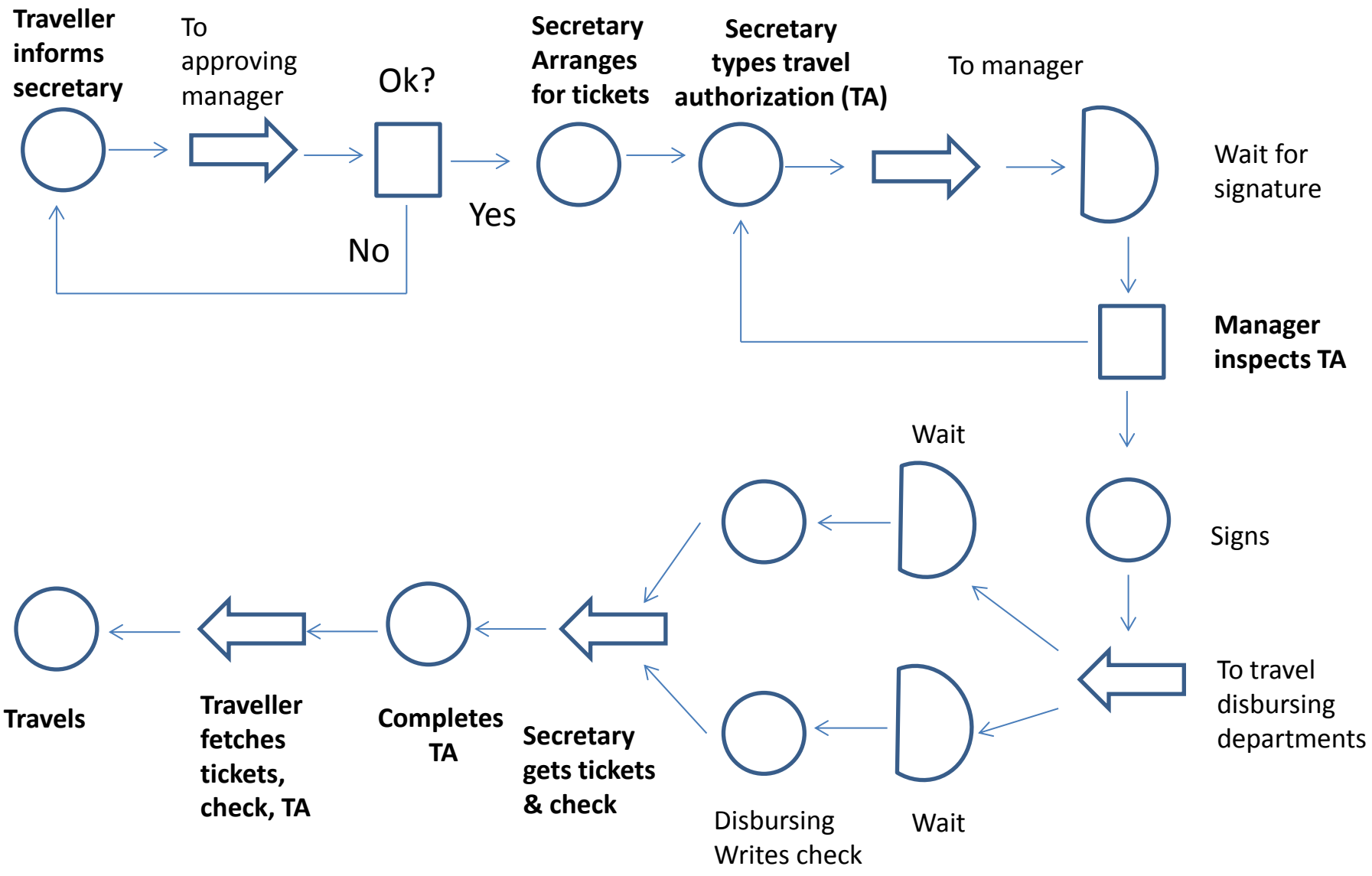
Flow Chart Symbols

 Operation	Activity that adds value to a work piece or provides a value-adding service to a customer; Usually requires a setup.
 Transportation	Movement of object from one workstation to another; Movement of customer from one operation to another.
 Inspection	Work is checked for some characteristic of quality; May call for 100% inspection or inspection by sampling.
 Storage	Applies to materials or documents; May be temporary or permanent.
 Delay	Time person, materials, or documents wait for next operation; In lot delay, wait is for other items in the lot to be processed; In process delay, entire lot waits for workstation or other bottleneck to clear.

Benefits of Flowcharts

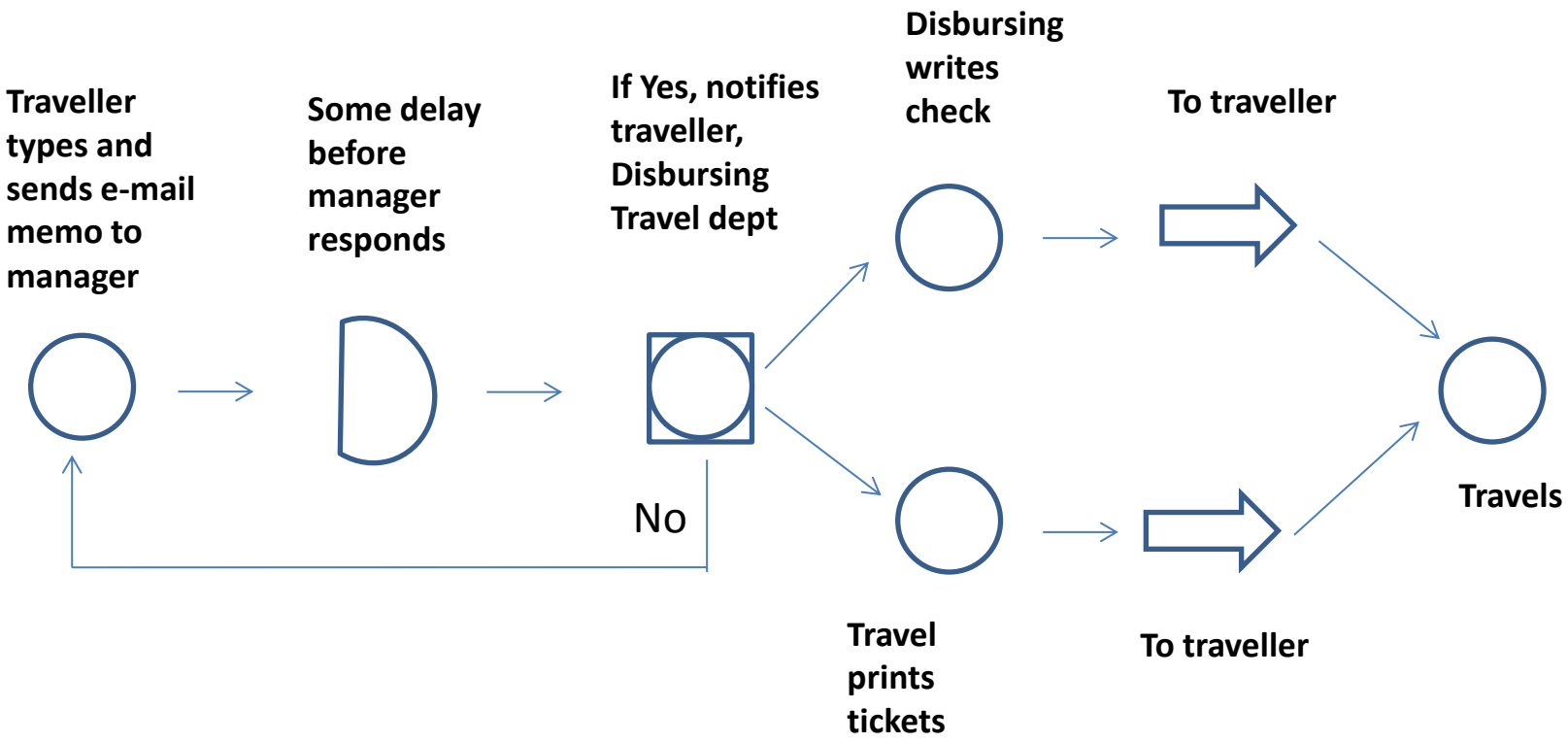
- Shows unexpected complexity, problem areas, redundancy, unnecessary loops, and where simplification may be possible.
- Compares and contrasts actual versus ideal flow of a process.
- Allows a team to reach agreement on process steps and identify activities that may impact performance.
- Serves as a training tool.

Case: Original Travel Authorization Process

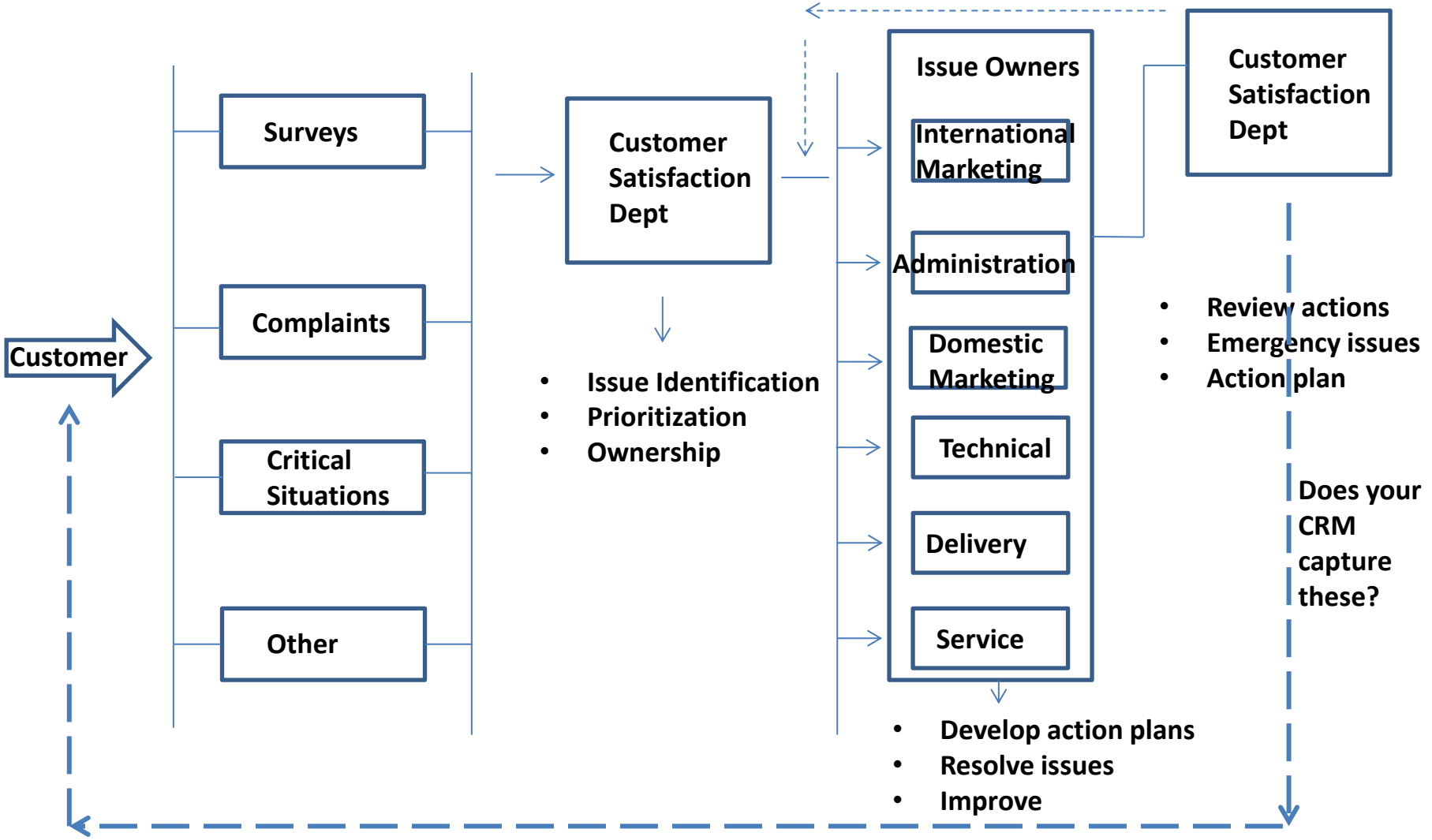


Same Case: Revised Travel Authorization Process

Improved process – with E-mail authorization

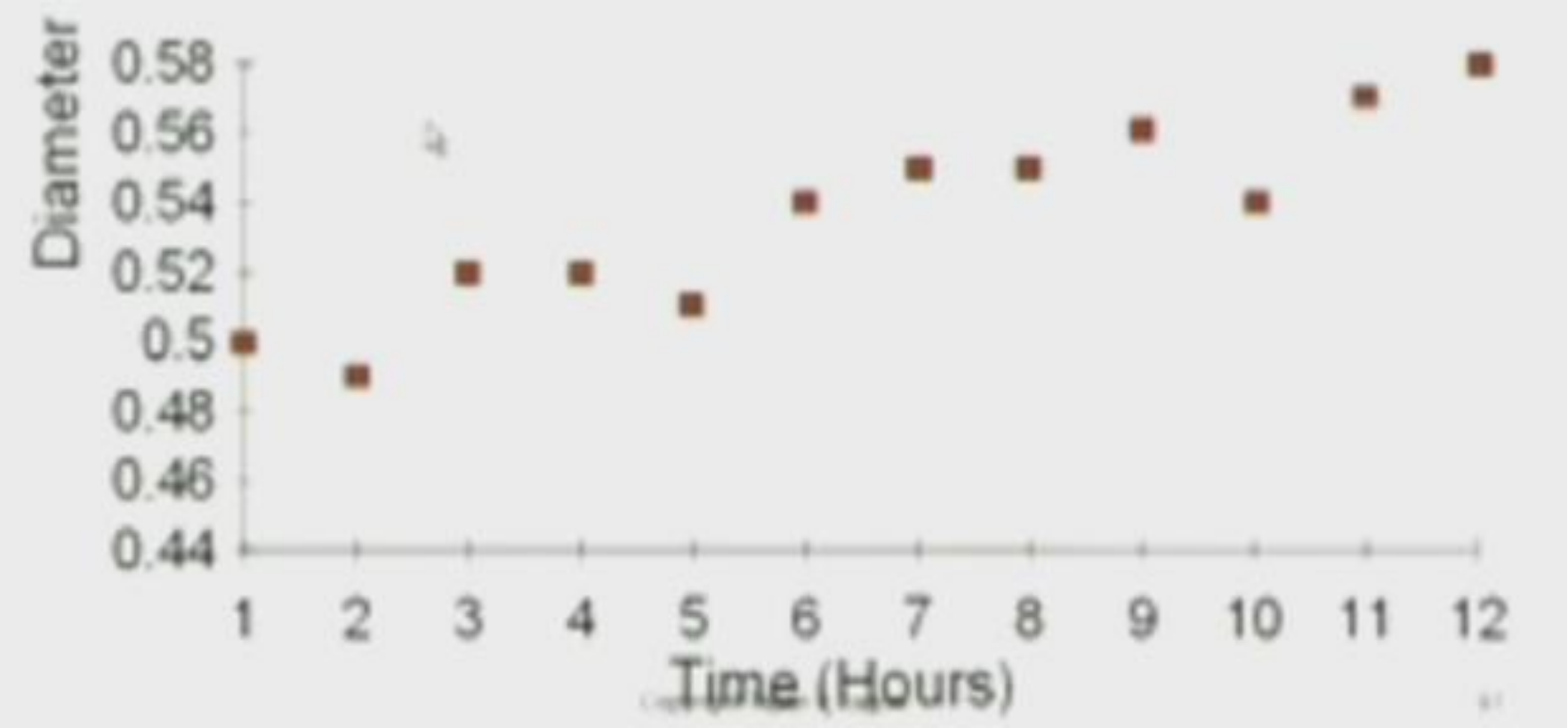


Flow chart of seeking customer feedback and taking corrective action



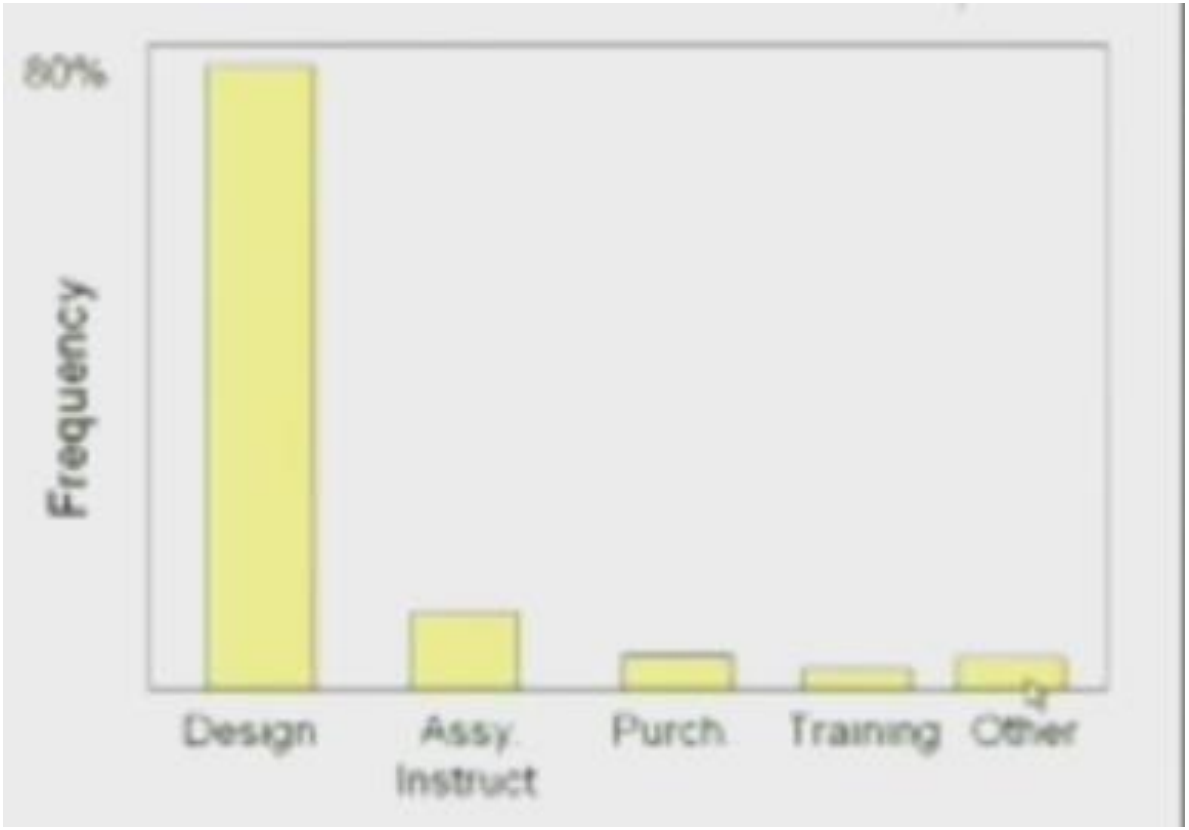
Tools #2: Run Chart – quick analysis data

Can be used to identify when the equipment or processes are not behaving according to specifications



Tool #3: Pareto Analysis – What is important?

Can be used to find when 80% of the problems may be attributed to 20% of the causes



Pareto Diagrams

- A Pareto distribution is one in which the characteristics observed are ordered from largest frequency to smallest.
- A Pareto diagram is a histogram of the data from the largest frequency to the smallest.

Benefits of Pareto Diagrams

- Helps a team focus on causes that have the greatest impact.
- Displays the relative importance of problems in a simple visual format.
- Helps prevent “shifting the problem” where the solution removes some causes but worsens others.

Tool #4: Checksheet

Can be used to keep track of defects or used to make sure people collect data in a correct manner

Monday

Billing Errors	
Wrong Account	
Wrong Amount	
A/R Errors	
Wrong Account	
Wrong Amount	

Benefits of Check Sheets

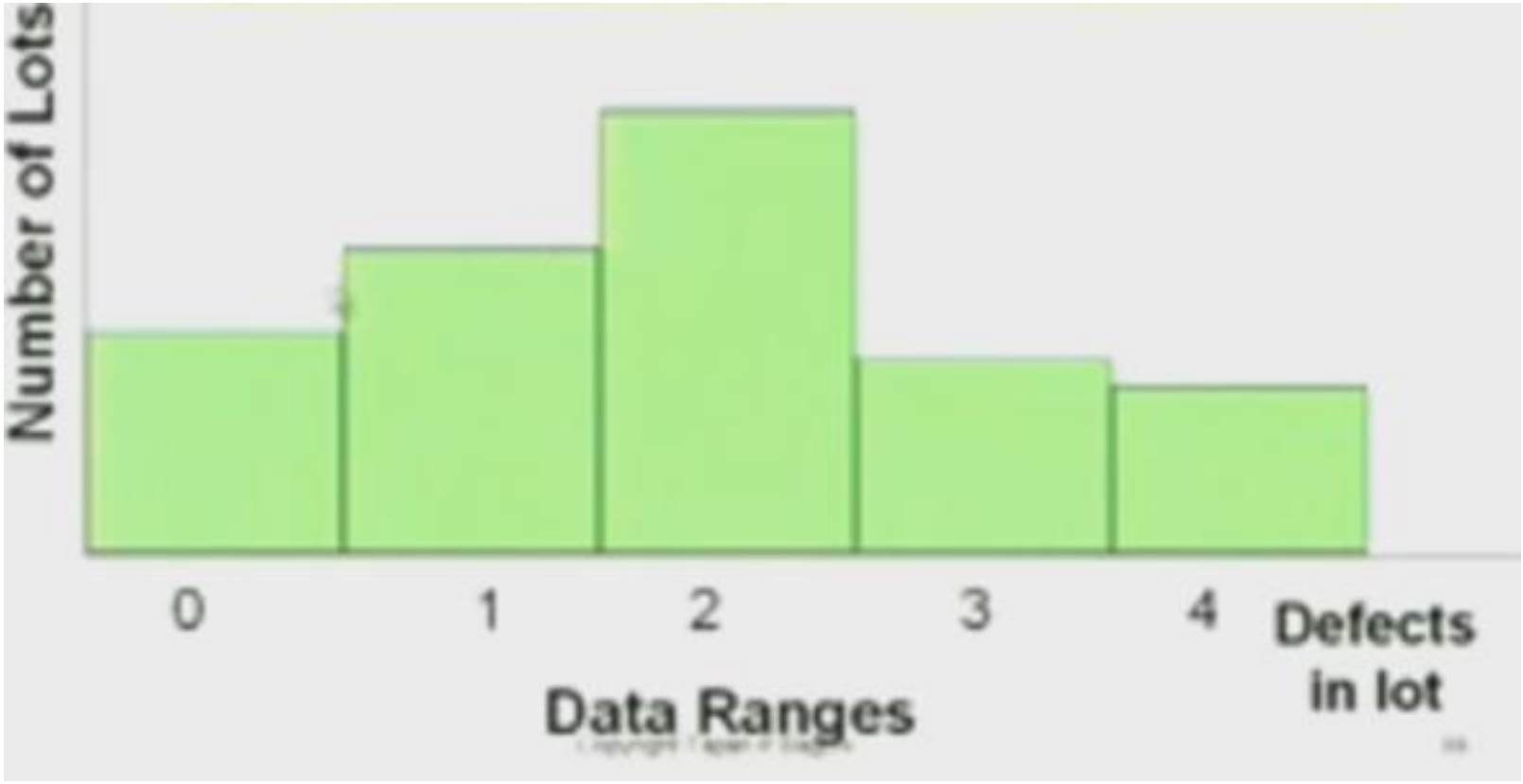
- Creates easy-to-understand data.
- Builds, with each observation, a clearer picture of the facts.
- Forces agreement on the definition of each condition or event of interest.
- Makes patterns in the data become obvious quickly.

Check Sheets

- Check sheets are special types of data collection forms in which the results may be interpreted on the form directly without additional processing.

Tool#5: Histogram

Identifies the frequency of quality defect occurrence and displays quality performance



Histograms

- Histograms provide clues about the characteristics of the parent population from which a sample is taken.
- Patterns that would be difficult to see in an ordinary table of numbers become apparent.

Benefits of Histograms

Displays large amounts of data that are difficult to interpret in tabular form.

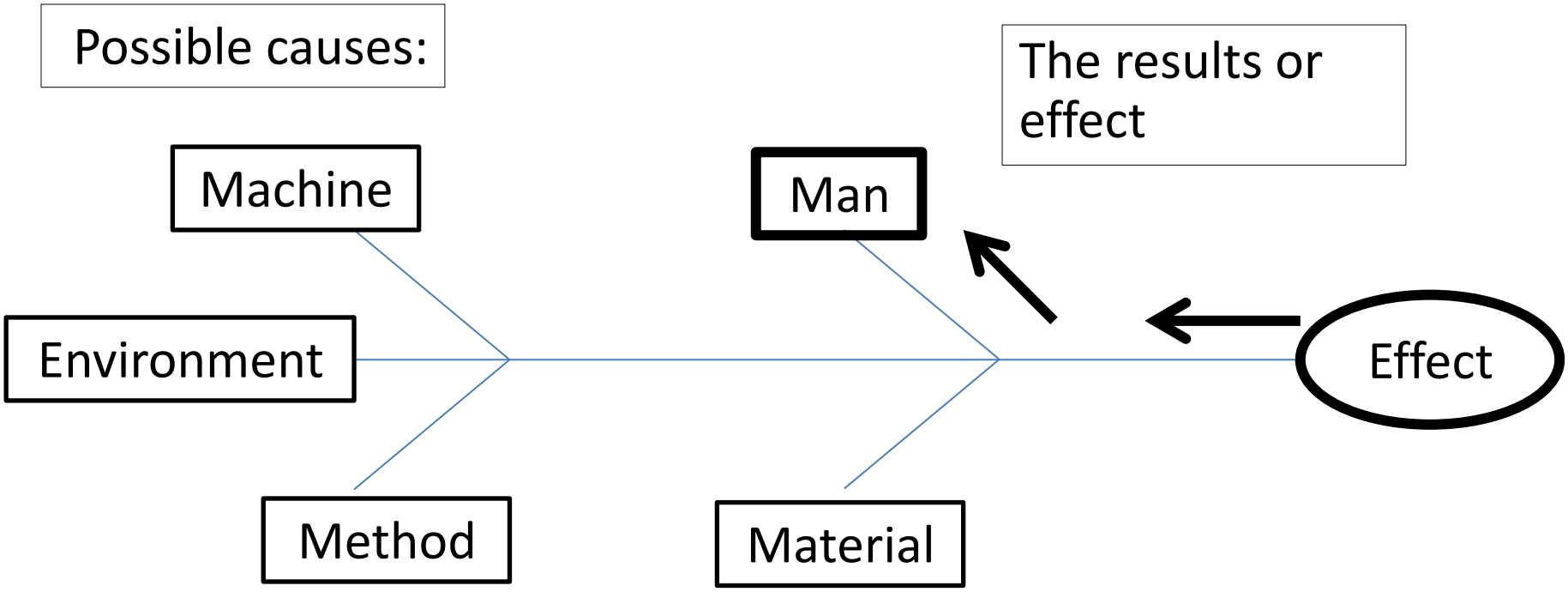
Shows centering, variation, and shape.

Illustrates the underlying distribution of the data.

Provides useful information for predicting future performance.

Helps to answer “Is the process capable of meeting requirements?”

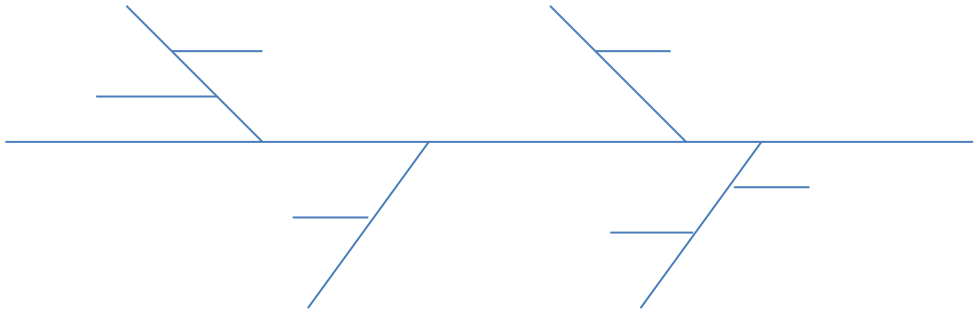
Tool#6: Cause & Effect or Fishbone Diagram… helps generate ideas



Systematically tracks backwards to find a possible cause of a quality problem (or effect)

Cause and Defect Diagram

- Enables a team to focus on the content of a problem, not on the history of the problem or differing personal interests of team members
- Creates a snapshot of collective knowledge and consensus of a team; builds support for solutions
- Focuses the team on causes, not symptoms



Effect

Cause

Methods for Generating Ideas

- Brainstorming
- Quality circles
- Interviewing
- Benchmarking
- 5W2H

Methods for Generating Solutions from Ideas

Brainstorming: Technique for generating a free flow of ideas to solve a problem.

Quality Circles:

Groups of workers who voluntarily meet to discuss ways of improving products or process.

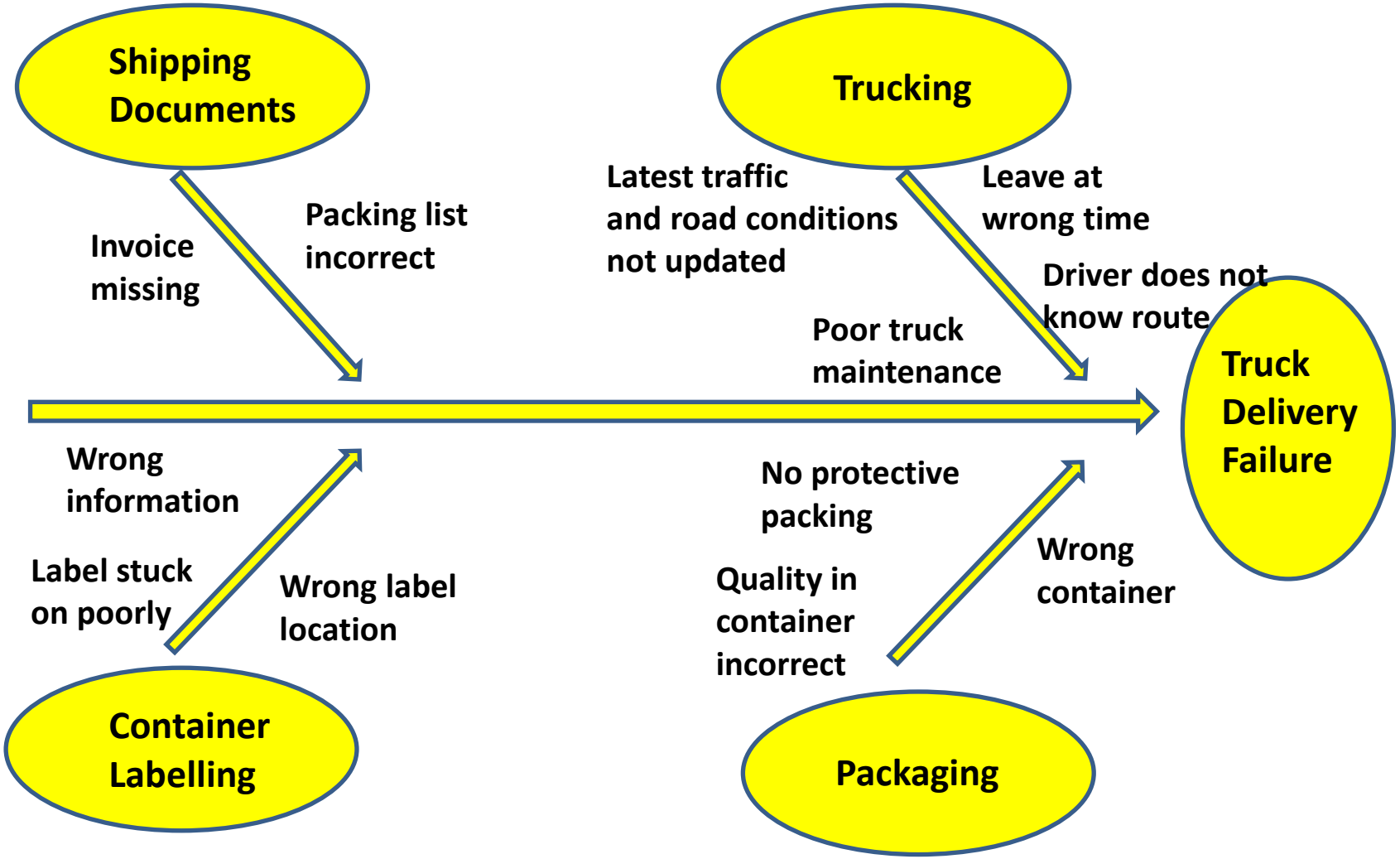
The circle comprises a number of workers who get together periodically to discuss ways of improving products and processes.

Quality circles are usually less structured and more informal than taskforces entrusted with a project.

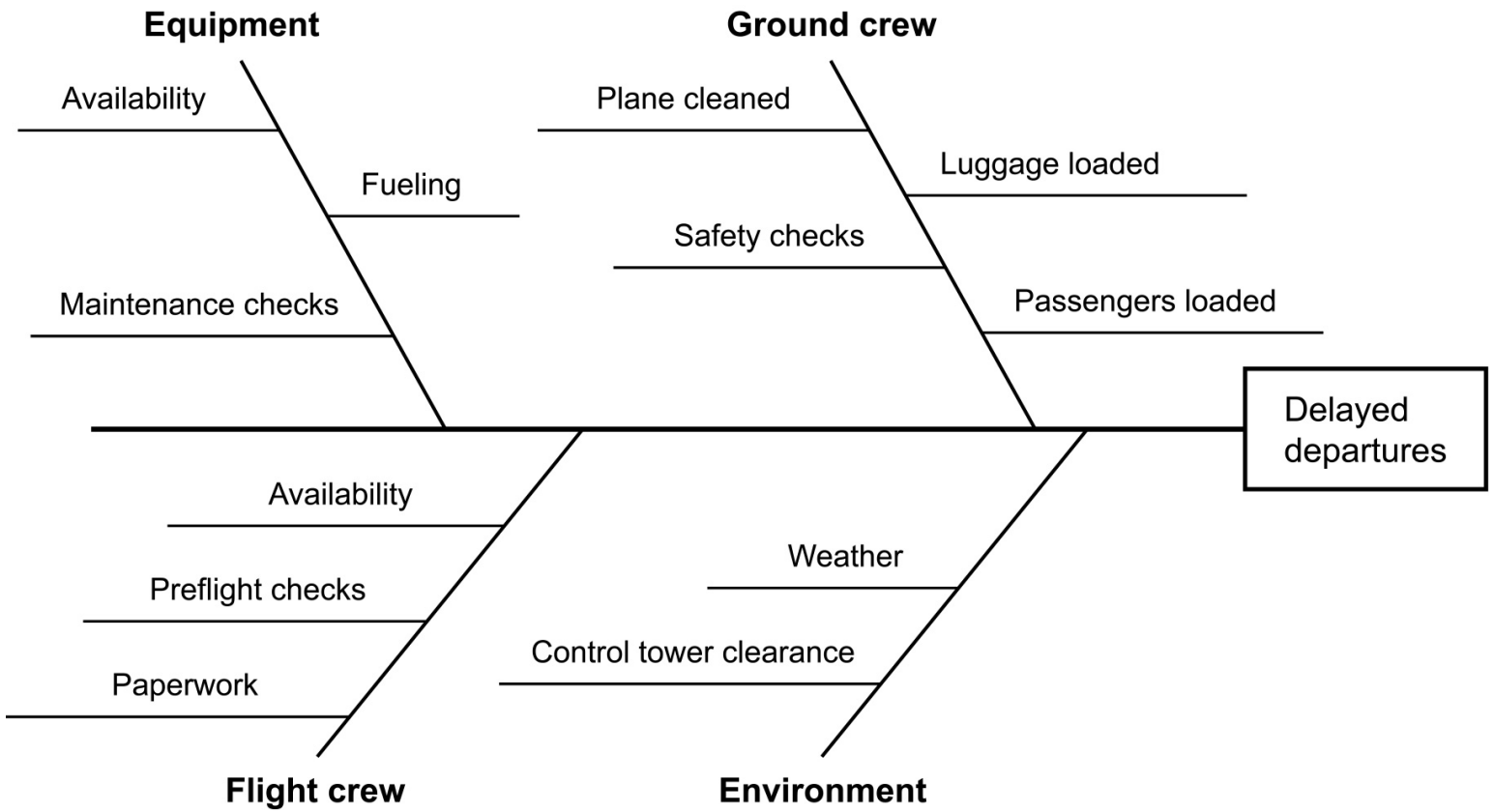
Suppliers can also give ideas

- Suppliers are partners in the process, and long-term relationship should be encouraged.
- Partnership gives suppliers a vital stake in providing quality goods and services.
- Suppliers can provide quality at the source, thereby reducing or eliminating the need to inspect deliveries (ISO 9000/QS 9000).
- Many suppliers now participate in new product development.

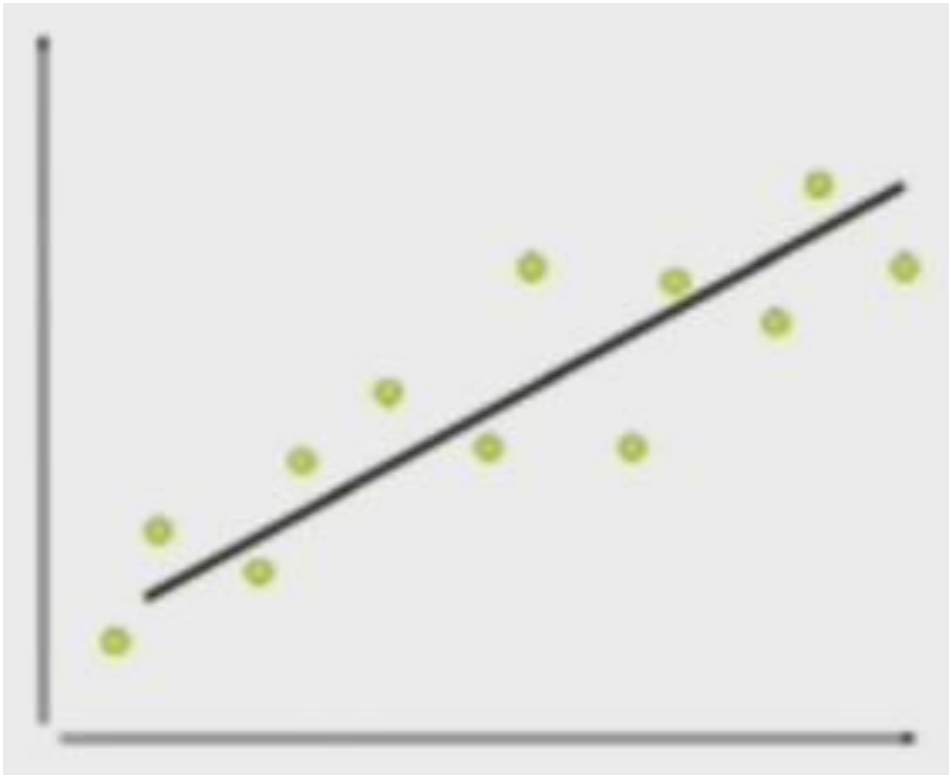
Fishbone Chart for Truck Delivery Failures – A service examples: Drivers and dispatchers provided the input



A very powerful tool for Root Cause Analysis
The Ishikawa Cause-Effect or Fishbone Diagram

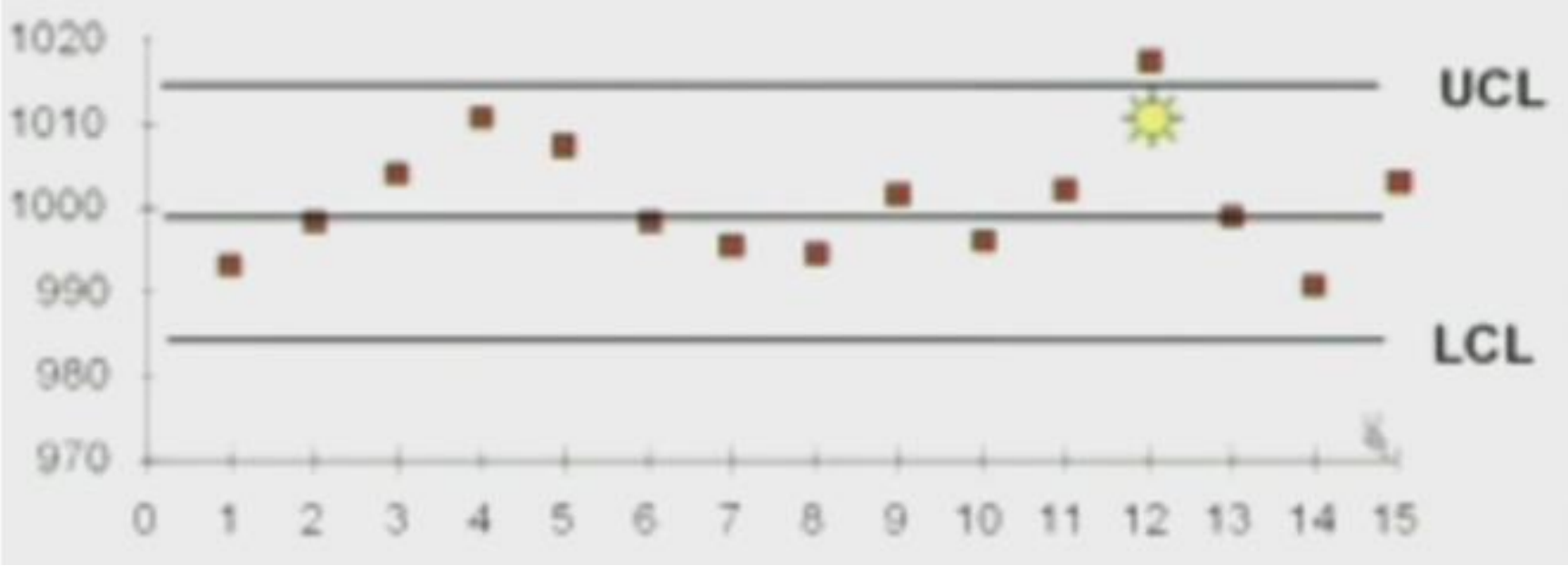


Scatter Diagram: It can uncover a relationship, starting with Fishbone



Tool #7: Control Charts (SPC) – on-line control

Can be used to monitor ongoing production process quality and quality conformance to stated standards of quality



The chart gives the signal, but you must complete the control loop!

Control Charts

Control charts show the performance and the variation of a process or some quality or productivity indicator over time in a graphical fashion that is easy to understand and interpret. They also identify process changes and trends over time and show the effects of corrective actions.

Benefits of Control Charts

- Monitors performance of one or more processes over time to detect trends, shifts or cycles.
- Distinguishes special from common causes of variation.
- Allows a team to compare performance before and after implementation of a solution to measure its impact.
- Focuses attention on truly vital changes in the process.

Statistical Process Control (SPC)

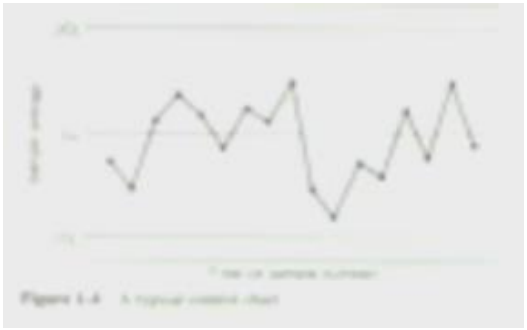
- A methodology for monitoring a process to identify special causes of variation.
- Signal the need to take corrective action when appropriate.
- SPC relies on control charts.

Operator is monitoring part dimensions by SPC

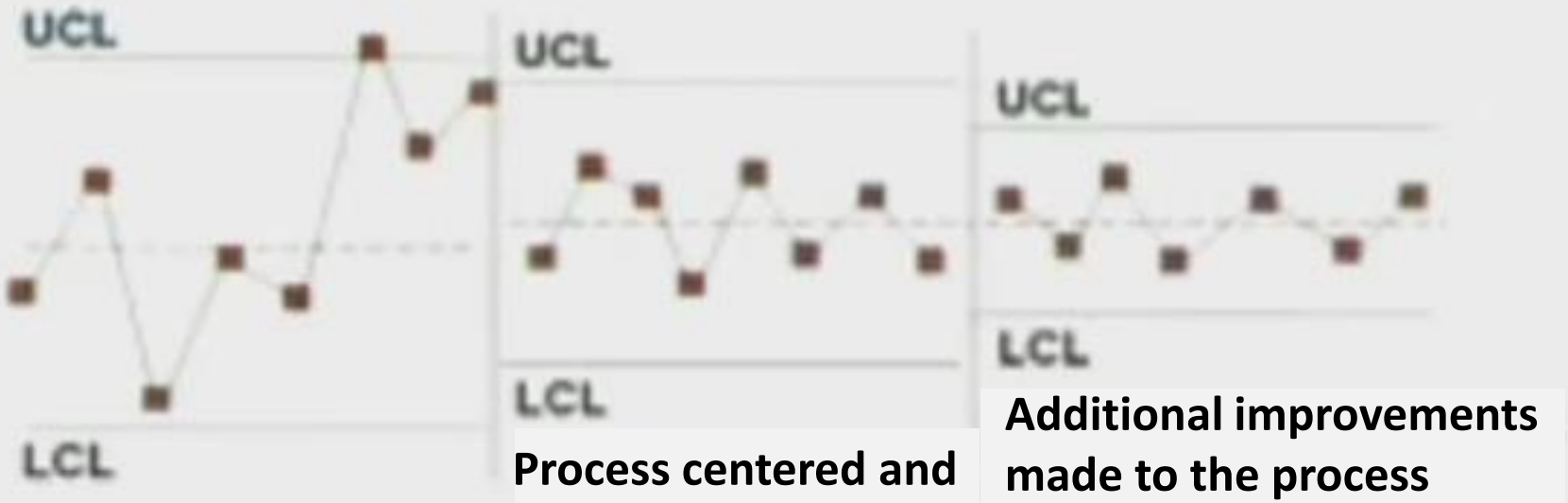
Control Charts

Control Charts

- Control charts are used for process monitoring and variability reduction
- SPC is an on-line quality control tool.



Tracking Improvements with SPC



Summary: 7 Basic quality improvement tools – where to use

- Run Chart – Tracking Trends

  Show changes in data over time | Measure one variable over time | Collect data sequentially

- Histogram – Process Centering, Spread and Shape

  Organize data | Evaluate process performance | Monitor process performance before and after a change

- Control Chart – Recognizing Sources of Variation

  Monitor the performance of a process over time | Recognize and control variation in a process | Methods to minimize variation and defects

Summary contd.
Quality improvement tools – where to use

- Pareto Chart – Focus on Key Problems

  Approach problems systematically| Discover the sources that may cause the majority of problems| Using different measurement scales break down problems in to smaller ones

- Flowchart – Picturing the Process

  See how an entire process works| Identify critical points in a process for data collection| Locate bottlenecks | Event, people and material flow

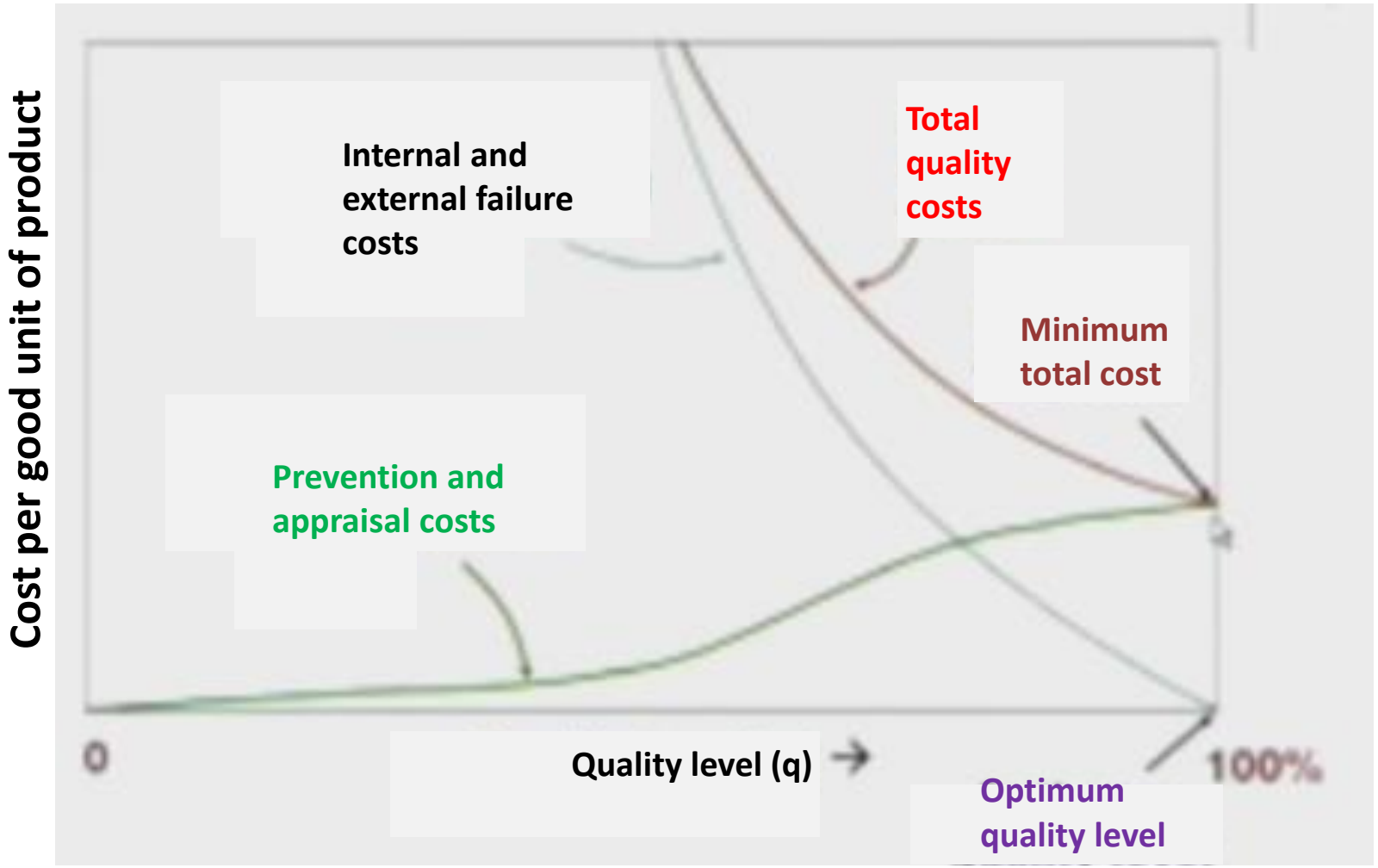
- Scatter Diagram – Relationships Between Variables

  Statistically test a theory about a possible cause and effect connection between two factors| Test and confirm a hypothesis using quantitative data| Data analysis

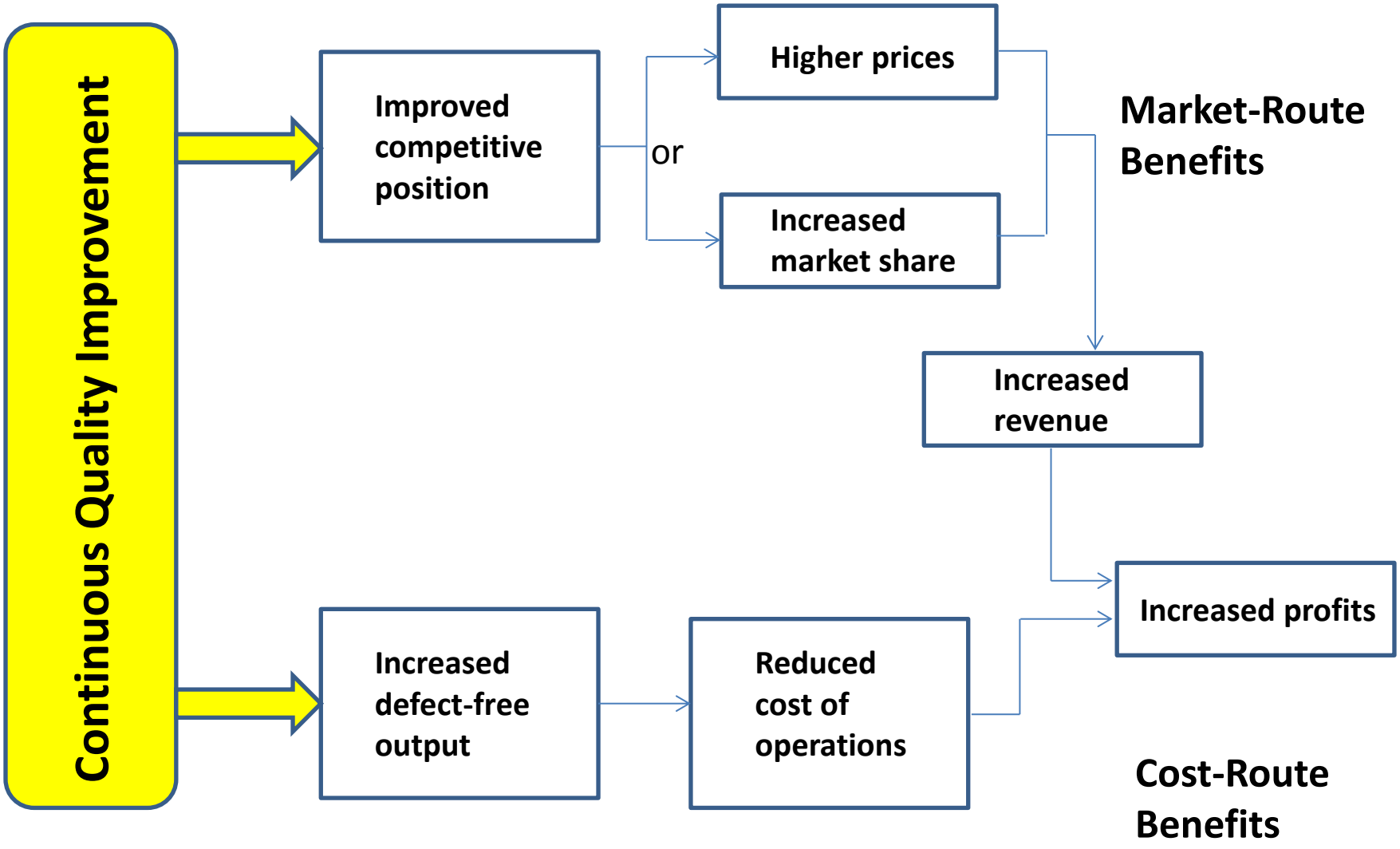
- Cause & Effect Diagram – Cure Causes, Not Symptoms

  Study a problem condition or improvement opportunity to find its ‘root’ causes | Blend creative thinking with data analysis in the problem-solving process

Total Quality Cost is Minimized at Zero Defects



Quality and Competitiveness



Benchmarking – A source of good ideas

Involves identifying companies or other organizations that are best at something and studying how they do it, to learn how to improve your operation.

The other organizations need not be in the same line of business as yours.

Xerox used a mail-order company, L.L. Bean, to benchmark order filling.

- American Express is well known for its ability to get customers to pay up quickly.
- Disney World for its employees commitment.
- Federal Express for its speed of delivery.
- McDonald's for its consistency.
- Xerox for its benchmarking techniques.