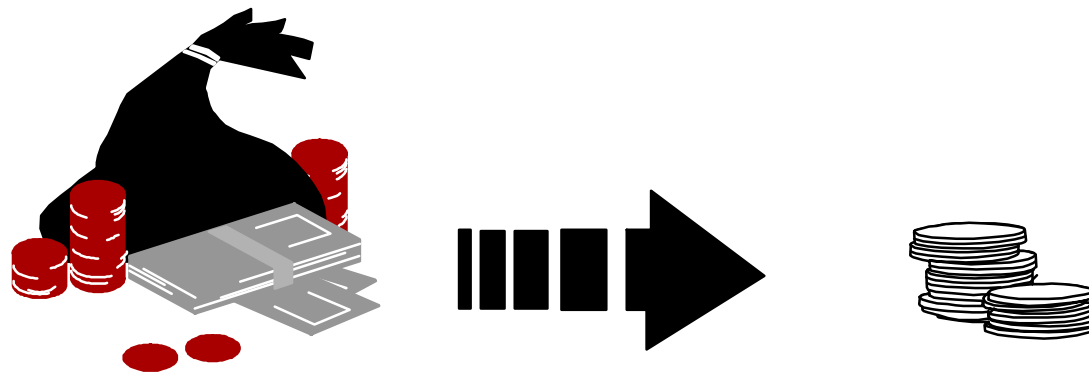


Introduction to Cost of Quality




presented by
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QA Manager, IDX Seattle

SASQAG

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July 16, 1998

Cost of Quality

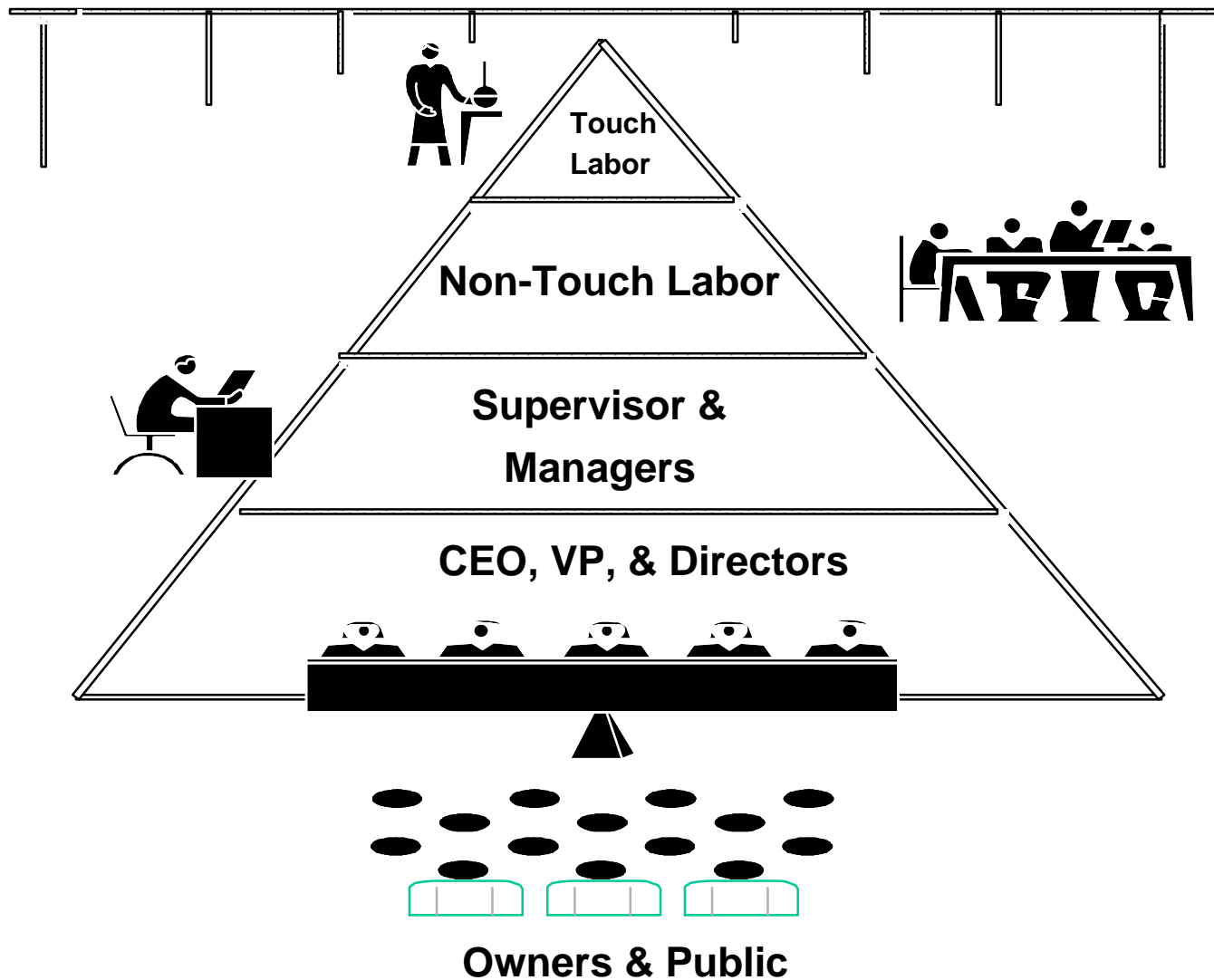


Schedule

- Introduction
- Principles of CQI (TQA) and Cost of Quality
- Strategy for COQ
- COQ Categories
- Implementation of COQ

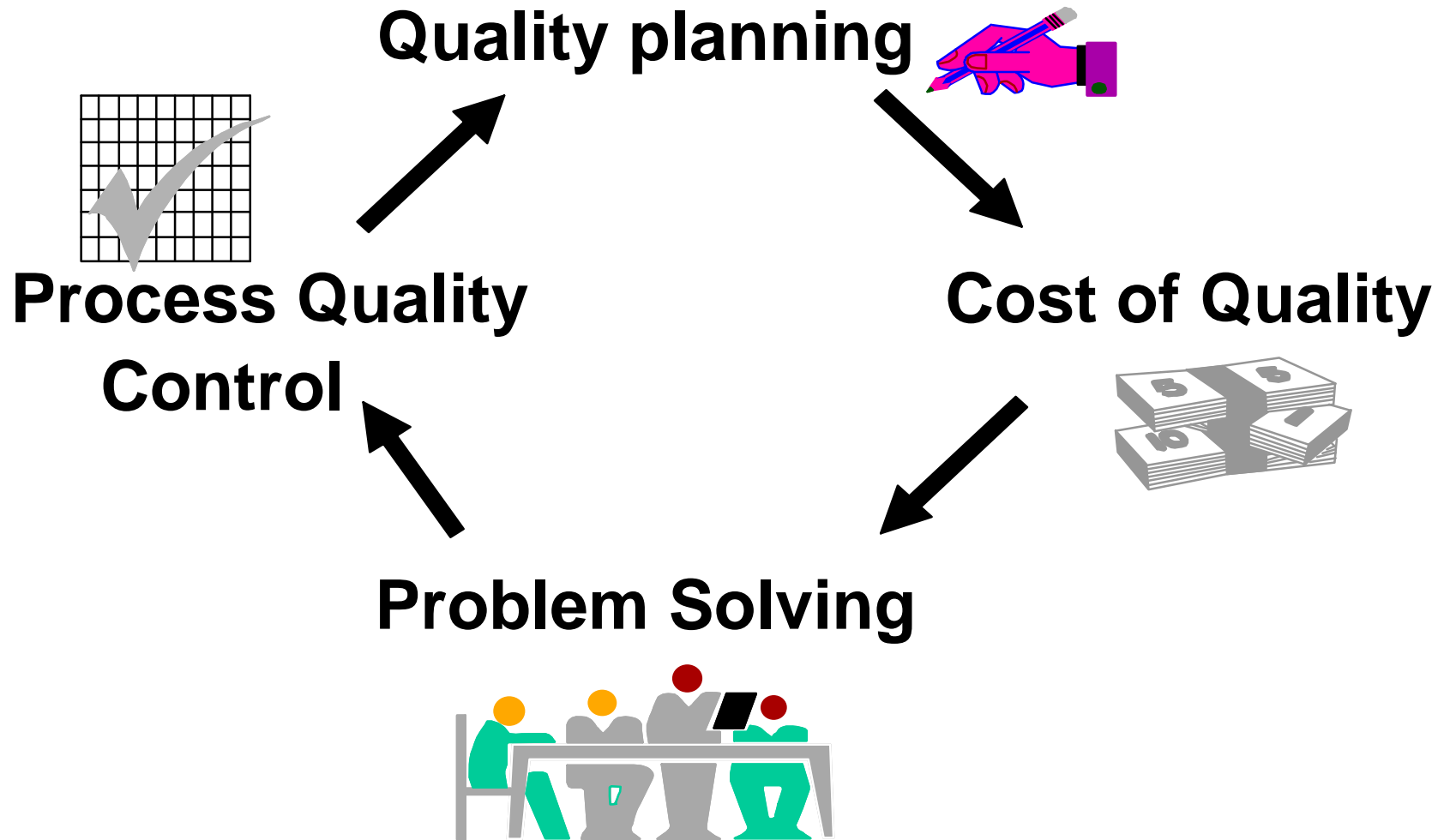
Total Quality Assurance

Scope of Influence on Product Quality



TOTAL QUALITY ASSURANCE

Elements for Success

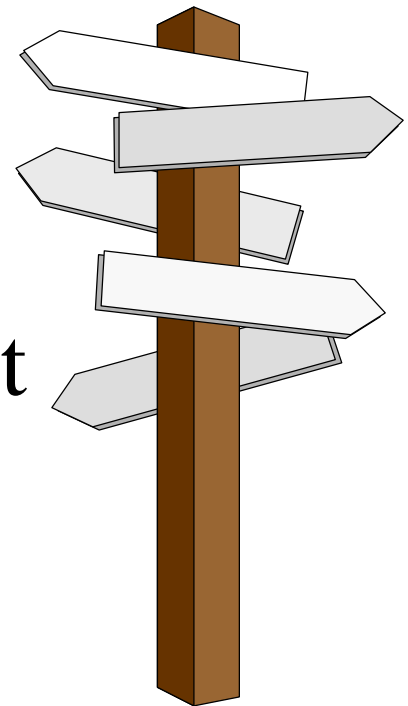


Cost of Quality

Running a company by profit alone is like driving a car by looking in the rearview mirror.

It tells you where you've been, not where you are going!

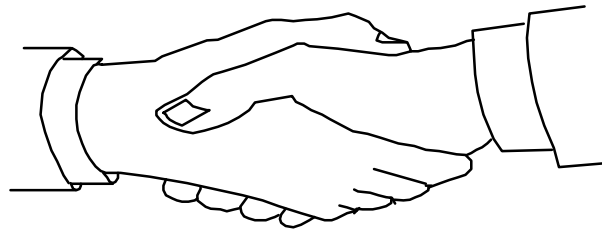
Dr. E. Deming



Cost of Quality Goal

- **The goal of a Cost of Quality system is to:**

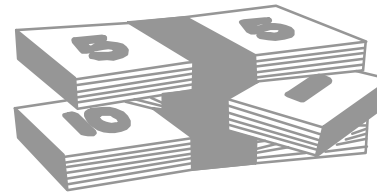
Facilitate Quality Improvements that leads to operating cost reduction Opportunities.



Cost of Quality

Definition

- The cost difference between present operation and the possible operation of a business with all systems and employees at 100% performance.

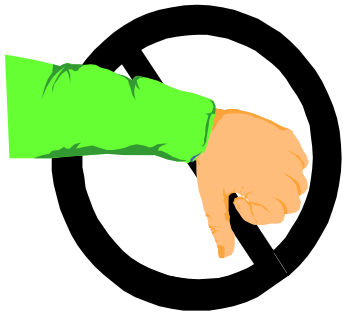


- The difference between actual revenues and what revenues could be if all customers were always satisfied, that is , No Unhappy Customers.

Cost of Quality

Cost of Quality is Not:

An Exact Cost.



A Performance Measurement.

Cost of Quality

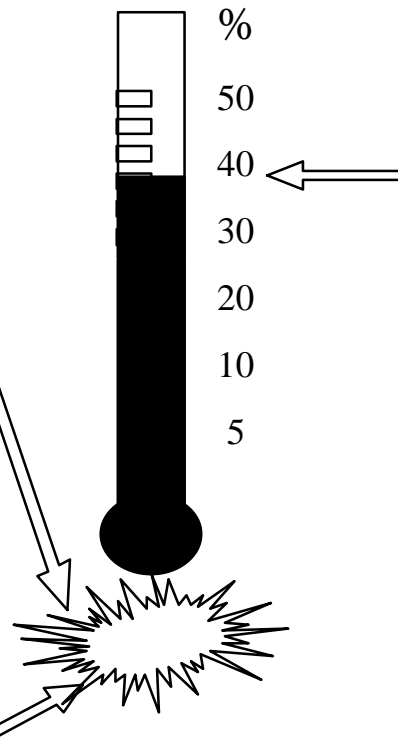
Measurement of a Company's Health

Financial Data

- Sales
- Operation Costs
- Material Costs
- Overhead Costs
- Gen. & Admin. Costs

Factory Data

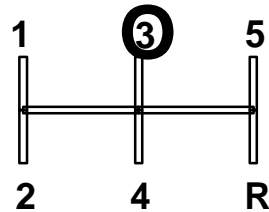
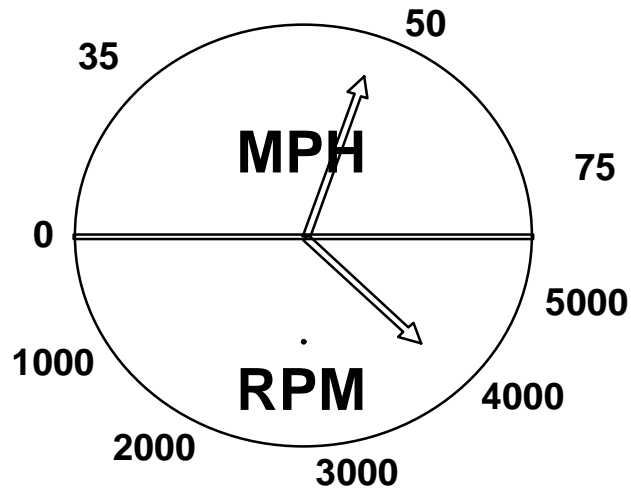
- Defect Reports
- Labor Hours
- Recode/Redesign
- Customer Complaints



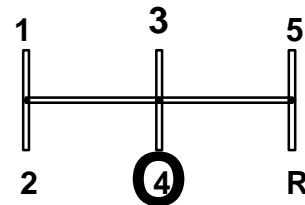
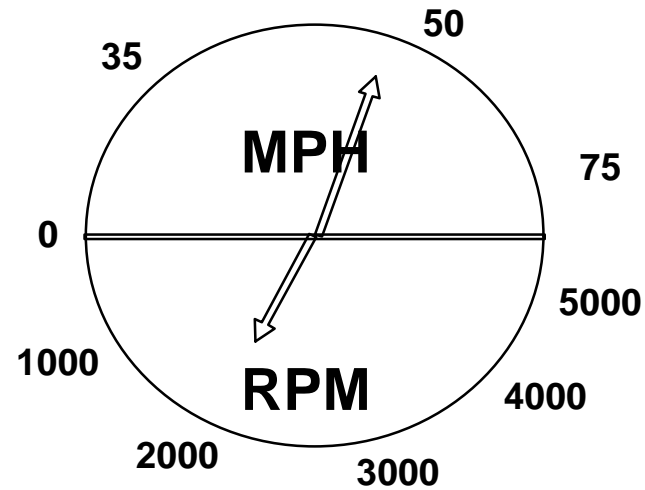
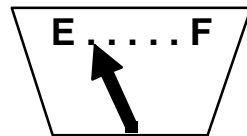
Percentage of
Sales Dollar

Cost of Quality

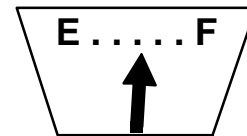
Similar to a Tachometer



FUEL

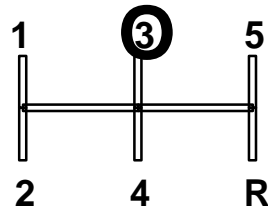
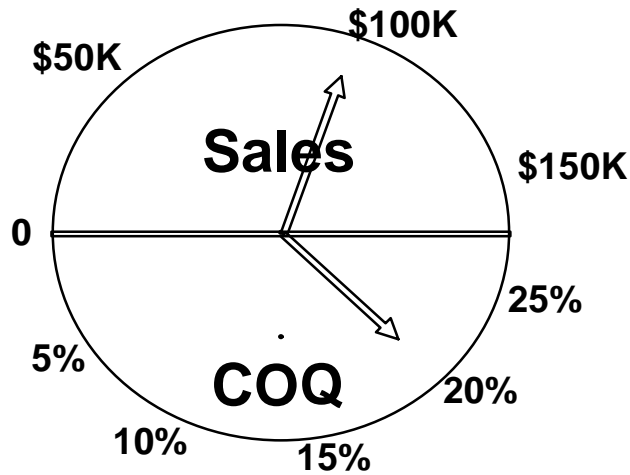


FUEL

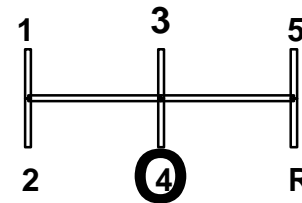
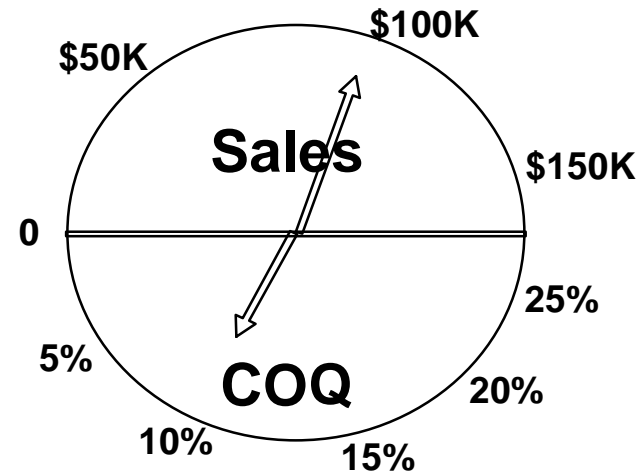
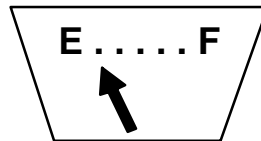


Cost of Quality

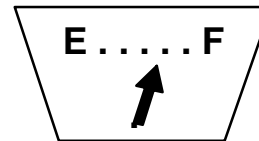
Similar to a Tachometer



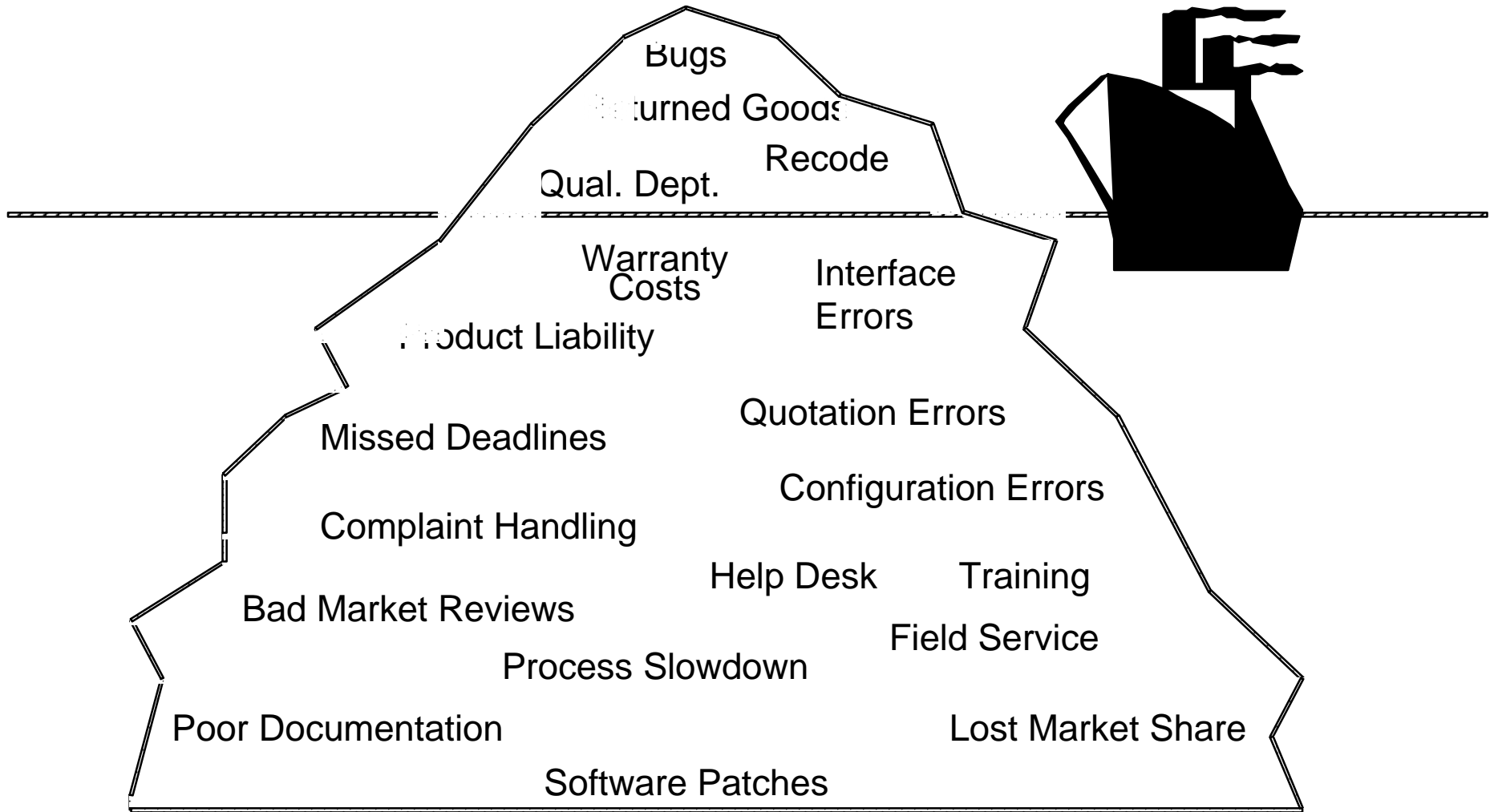
RESORCES



RESORCES

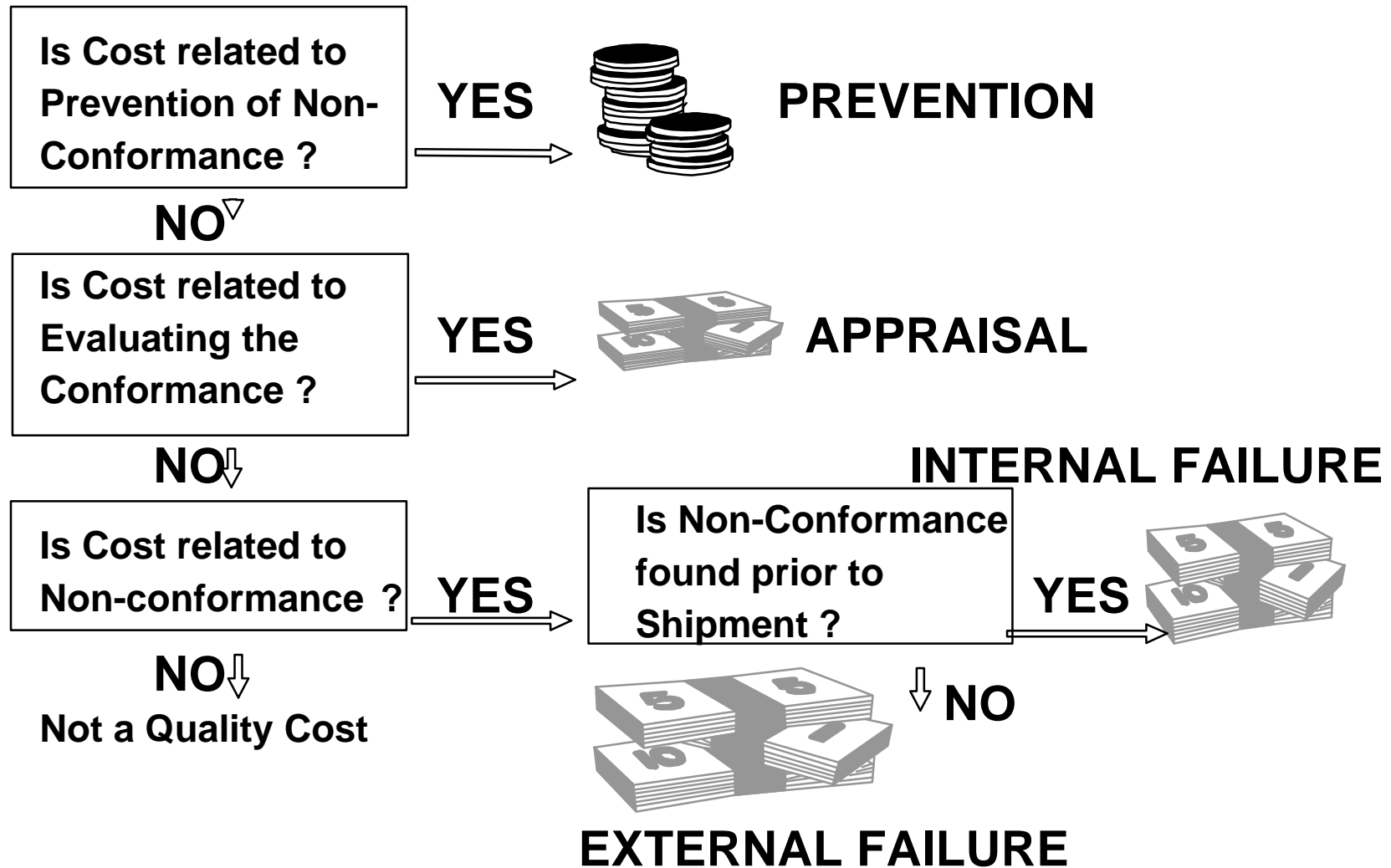


Cost of Quality Iceberg



Cost of Quality

Element Decision Flow



Cost of Quality

Examples of Elements

✓ PREVENTION

Design Quality Progress Reviews
Requirements Documentation
SQA Training
Cleanroom Software Engineering

✓ APPRAISAL

Unit Testing
Regression Testing
Automated Test Tools
User Interface Reviews

✓

✓ INTERNAL FAILURE

Recode/Repair Labor
Defect Tracking & Reports
Requirement Changes
Down Hardware

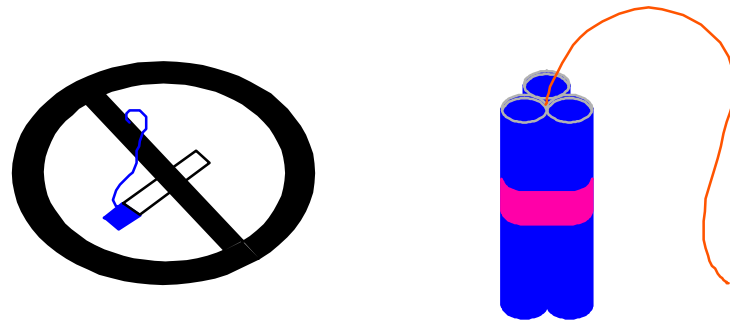
✓ EXTERNAL FAILURE

Returned Goods
Liability Costs
Help Desk
Lost Sales/Market Share

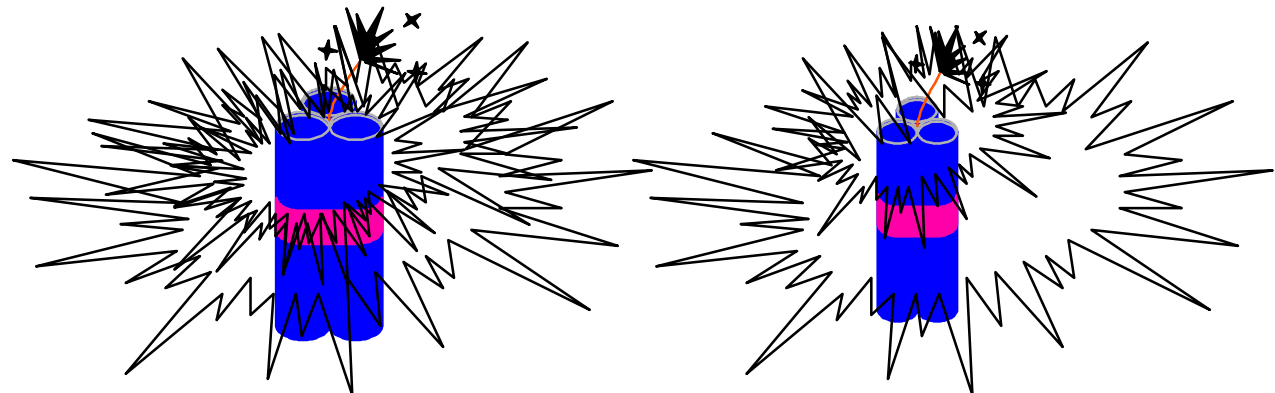
Cost of Quality

Corrective Action vs Failure

- Corrective Action is paid for Once,



- Whereas Failure to take corrective action may be paid for over and over again.

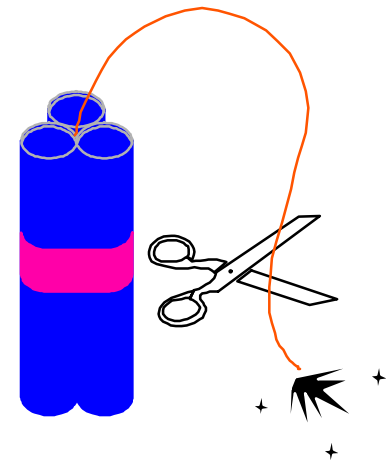


Cost of Quality

Strategy Premise

The Strategy is based on the premise that:

- **For each failure there is a root cause.**
- **Causes are preventable.**
- **Prevention is always cheaper.**



Cost of Quality

Strategy for using Quality Costs

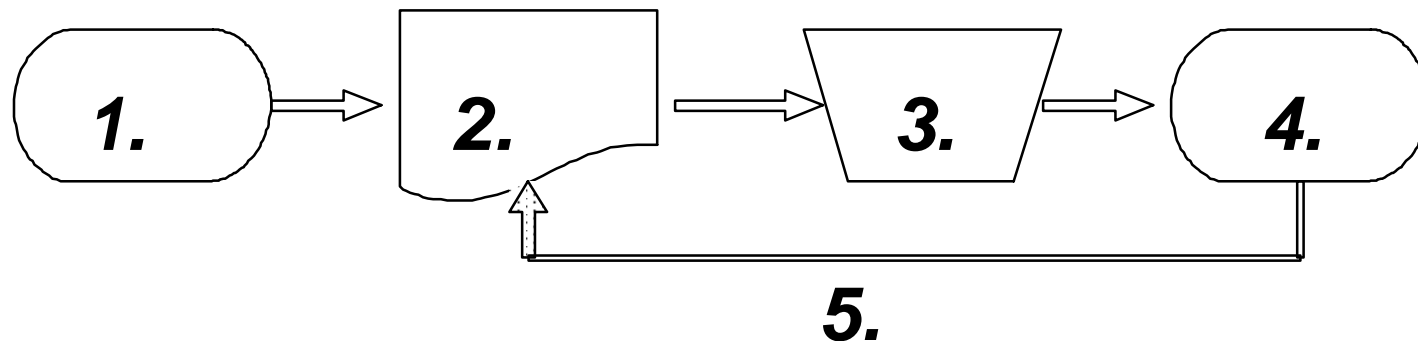
- Take direct attack on FAILURE costs, try to drive to zero \$.
- Invest in the "right" PREVENTION activities to bring about improvements.
- Reduce APPRAISAL costs according to results achieved.
- Continuously evaluate and redirect PREVENTION efforts to gain further improvement.



Cost of Quality

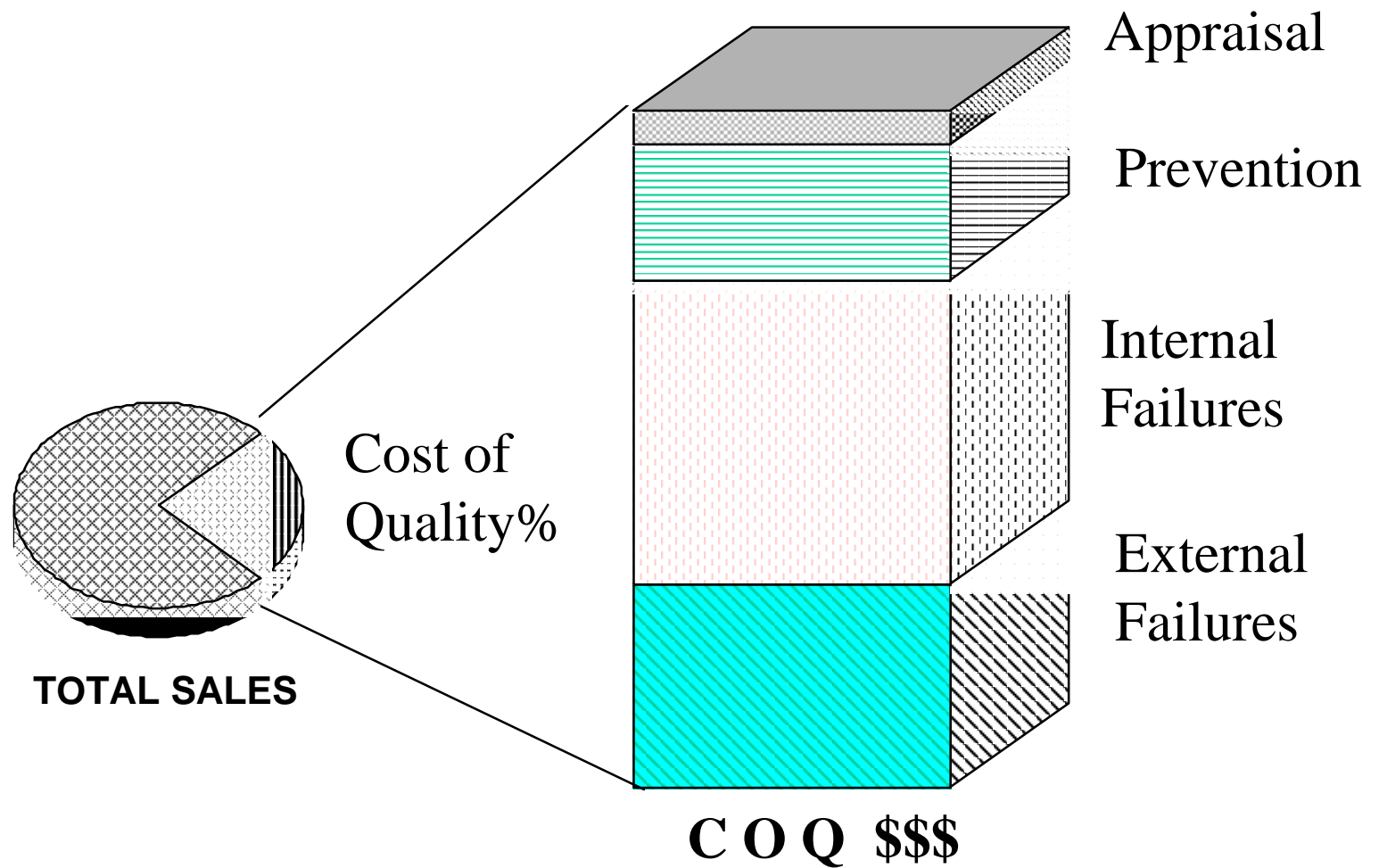
Recipe for Success

1. Educate & Develop: Management & Employee Support
2. Collect, Analysis and Report Cost of Quality Data
3. Involve & Support Corrective Action Teams (CAT)
4. Implement Changes recommended by CAT
5. Go to Step #2 (expand data items collected)



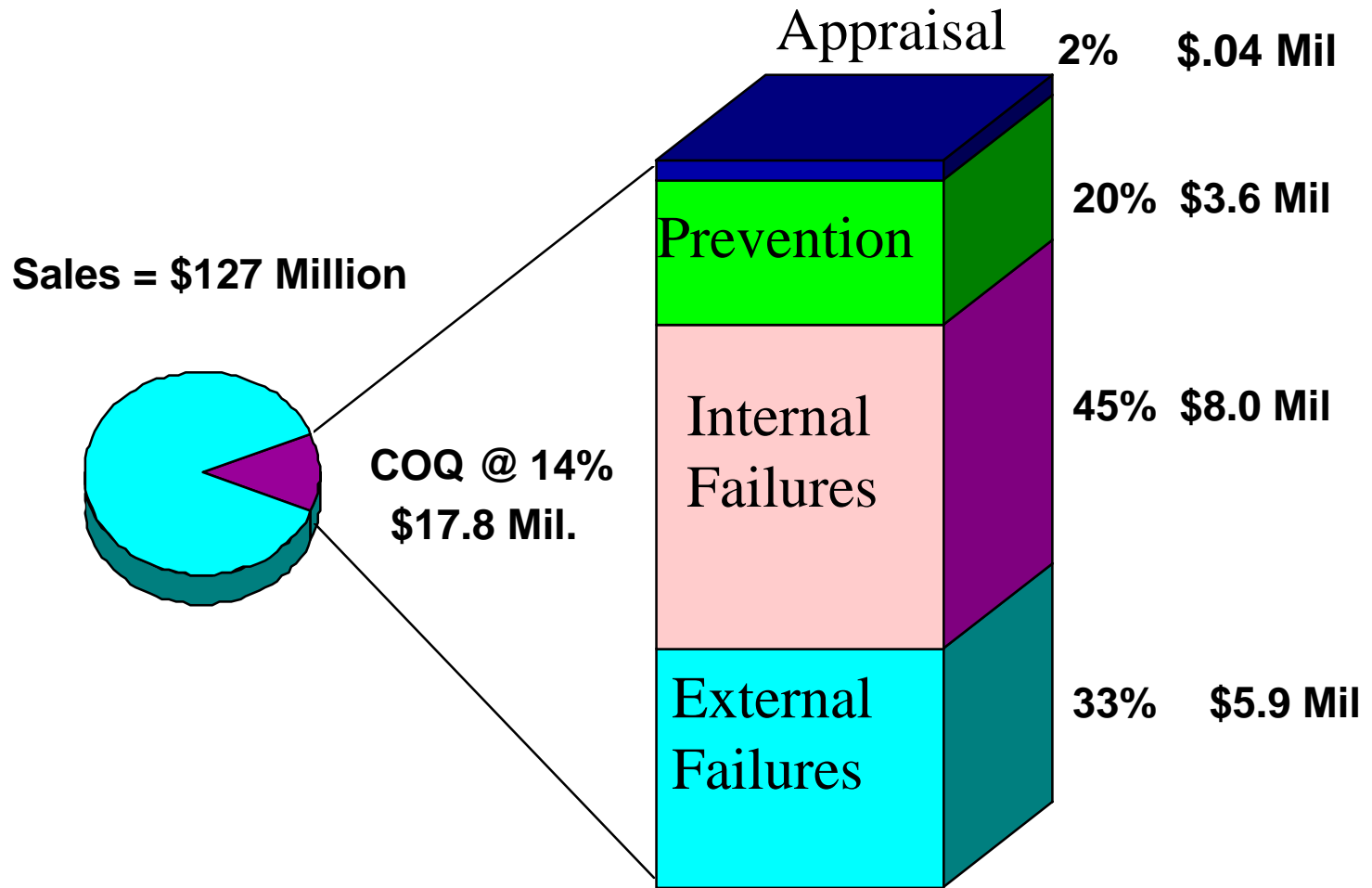
Cost of Quality

NORMAL DISTRIBUTION



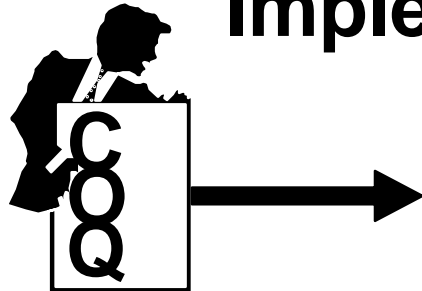
Cost of Quality

Example based on 14% COQ

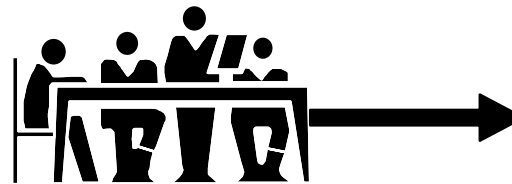


Cost of Quality Evolutionary Phases

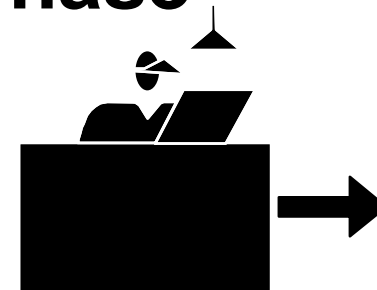
Implementation (Selling) Phase



Project (Pilot) Phase

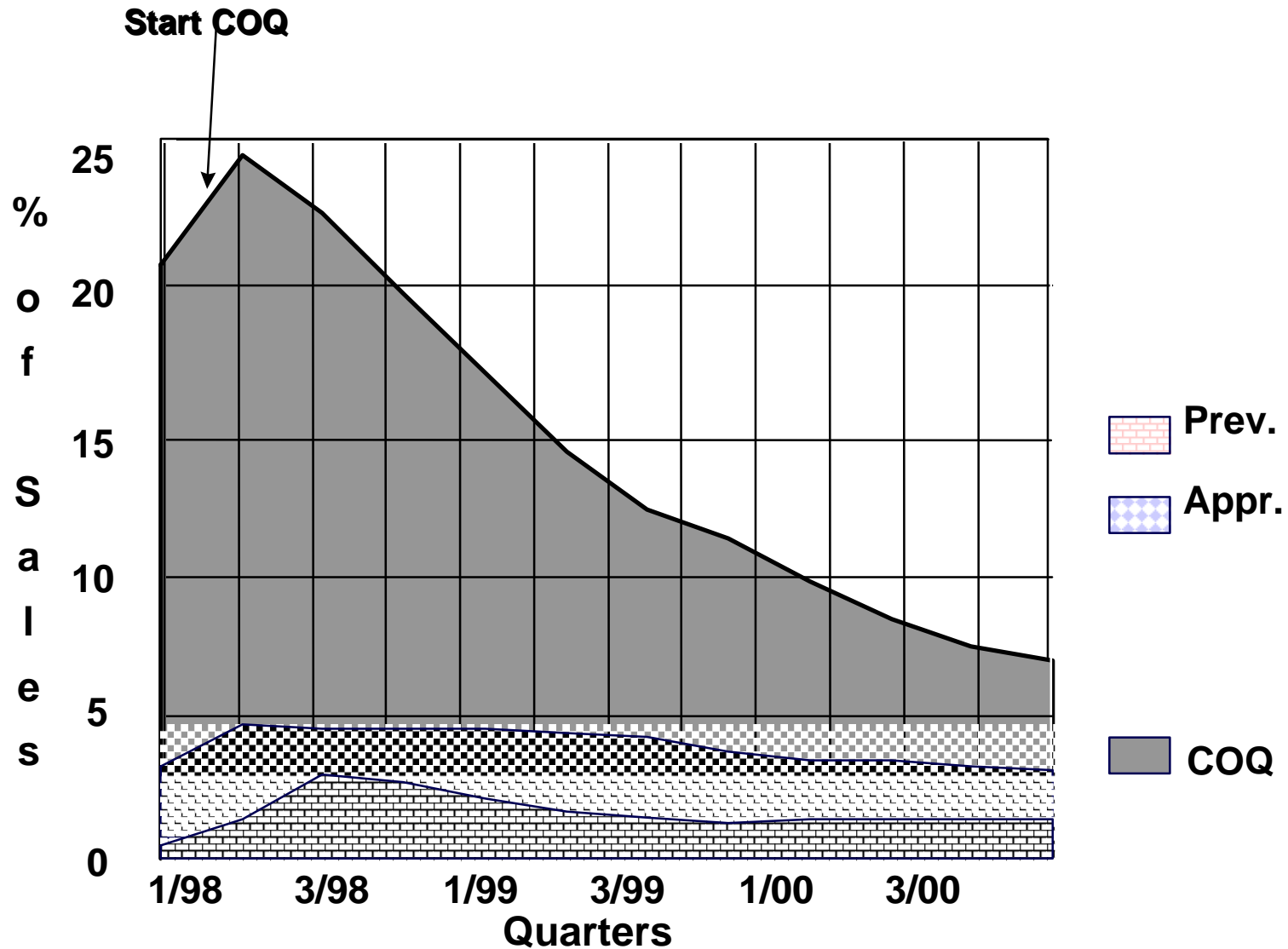


Expand & Ongoing Phase



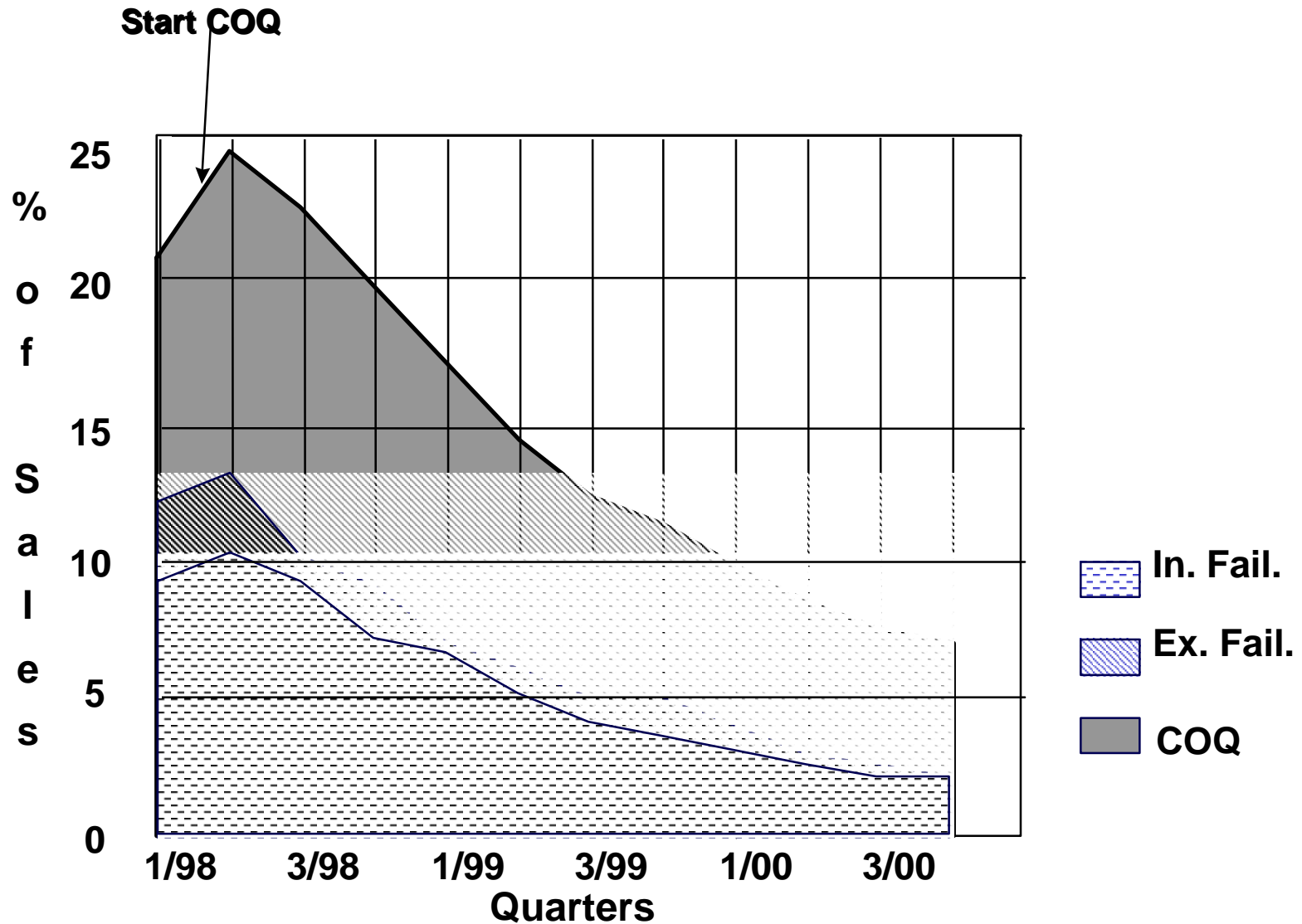
Cost of Quality History

Prevention & Appraisal Costs



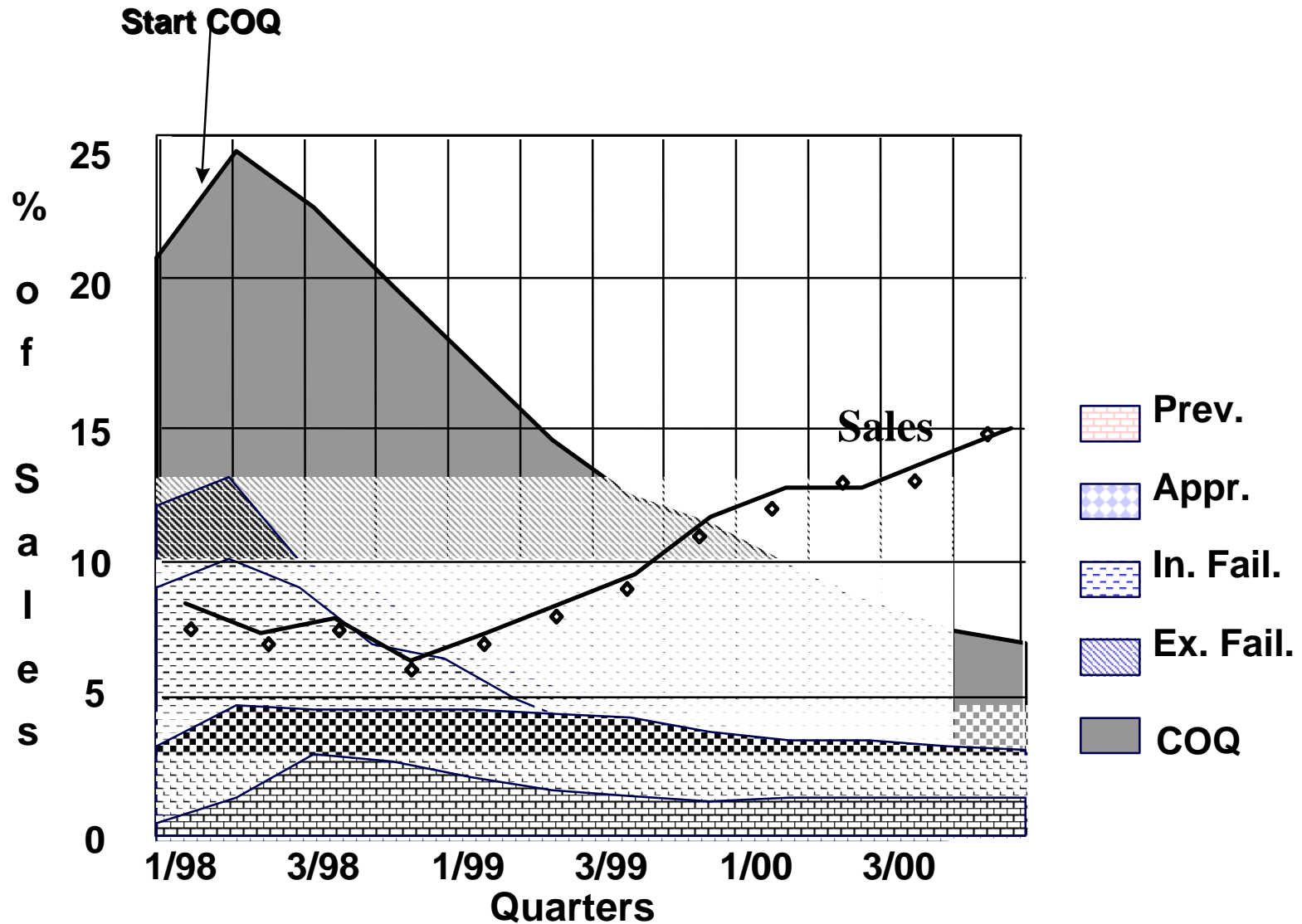
Cost of Quality History

Failure Cost



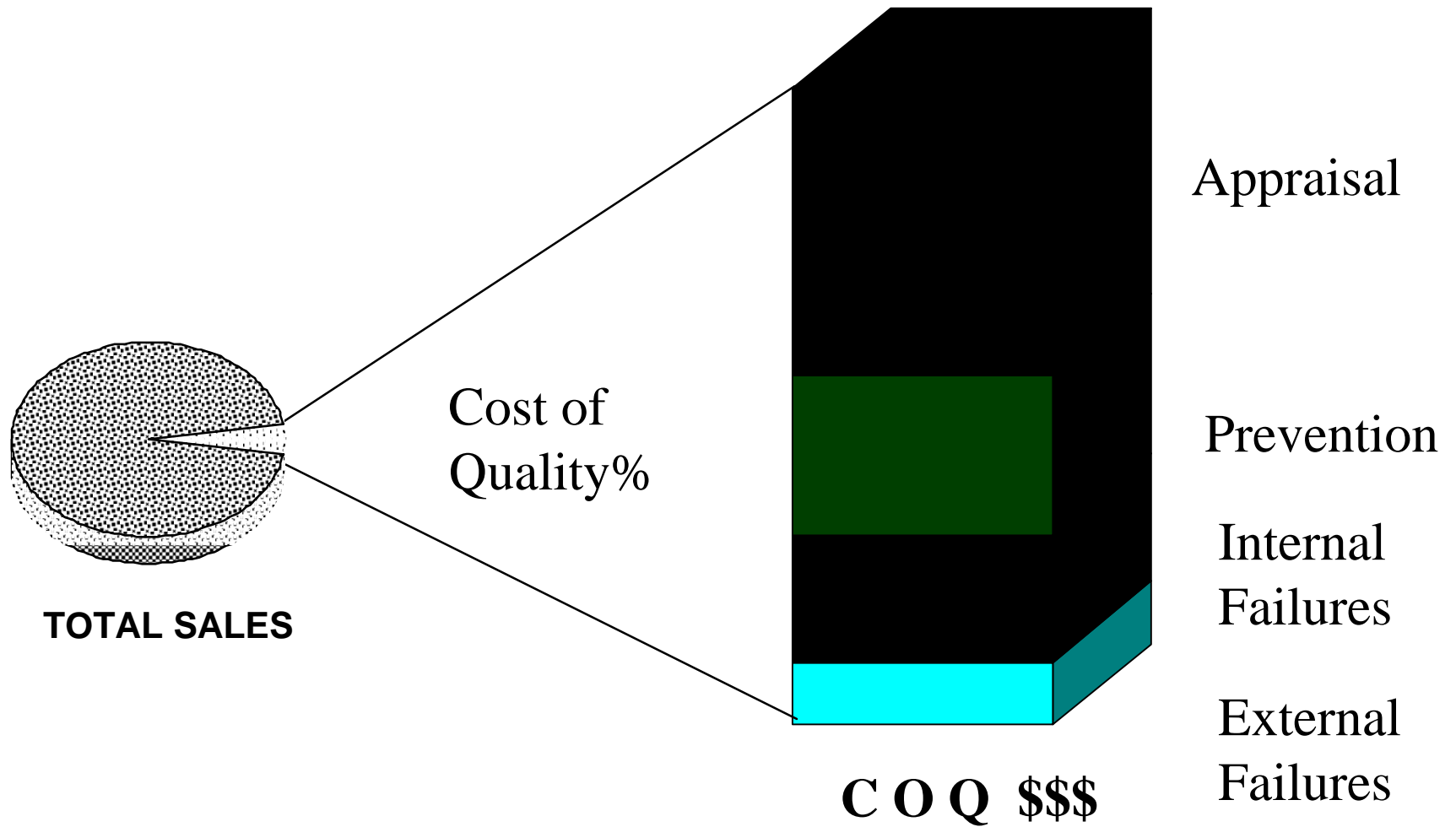
Cost of Quality History

COQ as a Percentage of Sales



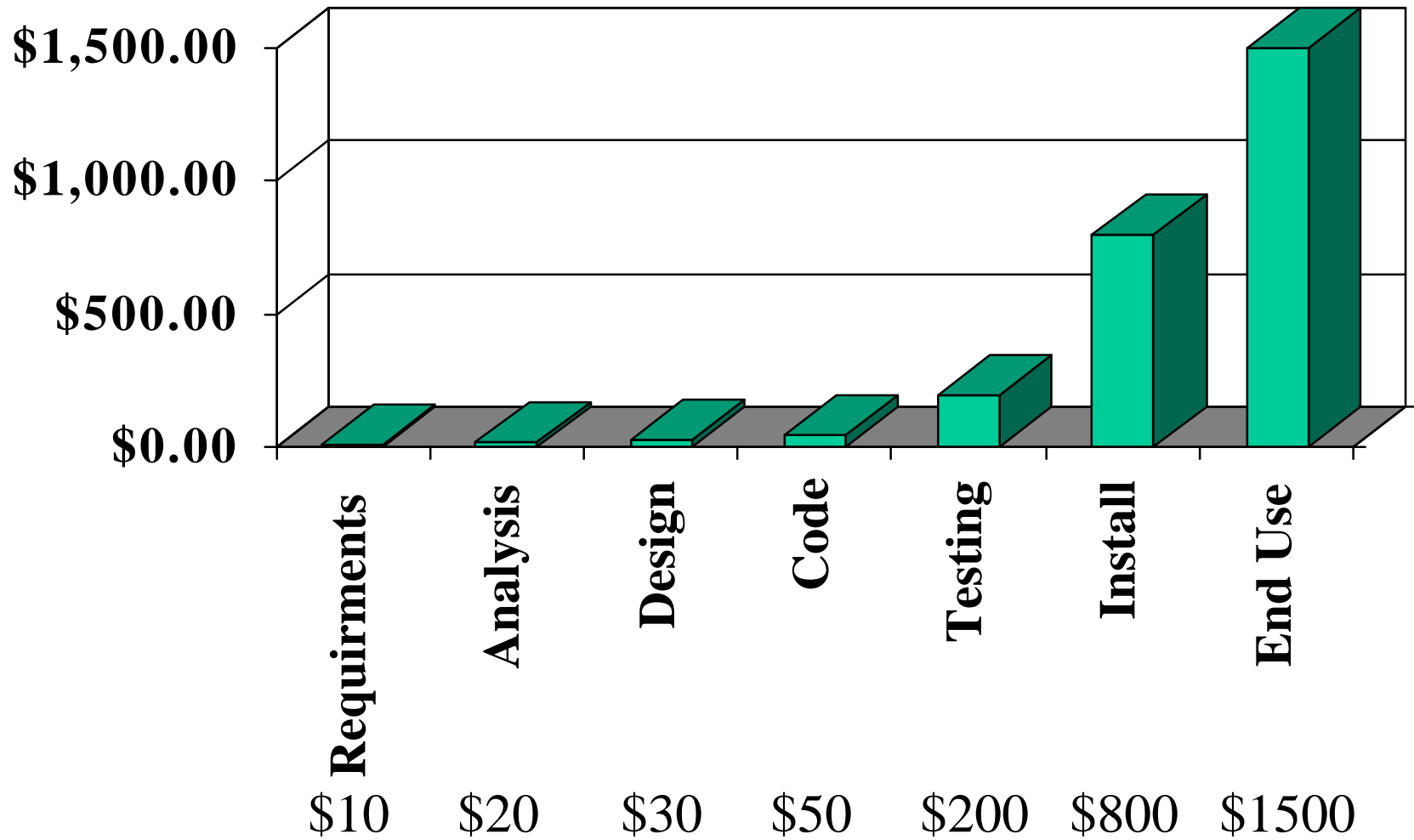
Cost of Quality

OPTIMUM DISTRIBUTION



Cost of Quality

Est. Cost to Fix a Bug at Various Stages

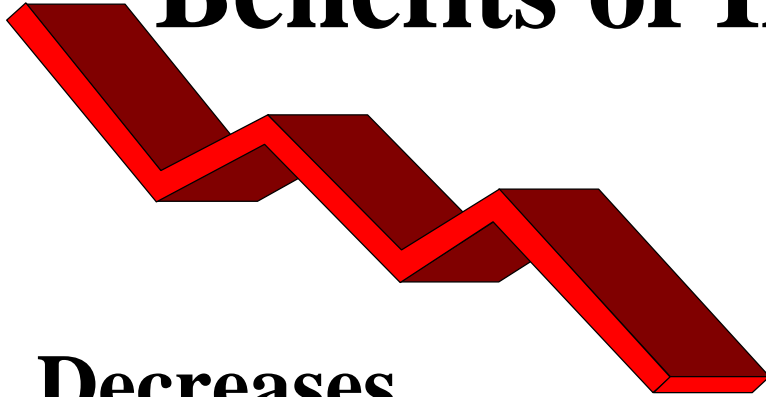


Cost of Quality - PARETO

Accumulated Cost per Item Type



Benefits of Improved Quality



Decreases

Defects

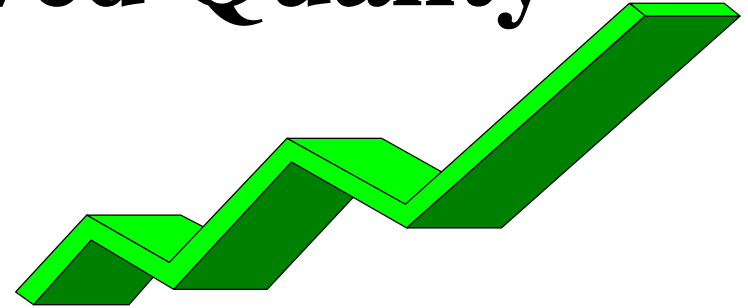
Overall Costs

Returned Goods

Employee Turnover

Customer Complaints

Owner & Mgmt. Stress



Increases

Revenue

Sales

Capacity

Employee Satisfaction

Customer Satisfaction

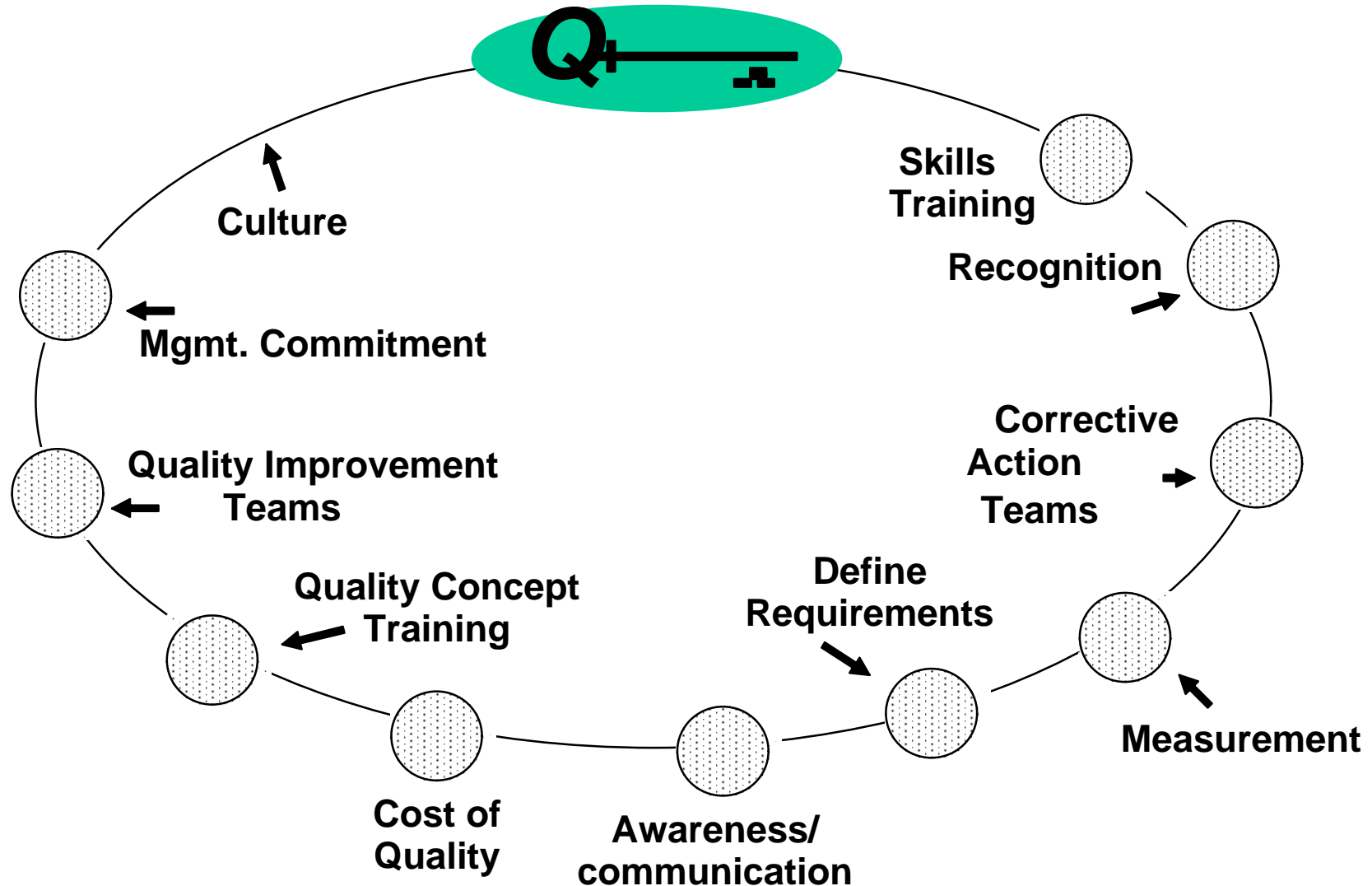
Market Share

Competitive Edge

Personal Time Away

QUALITY is KEY

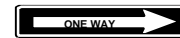
CHAIN of ELEMENTS



Total Quality Assurance

Required Attitudes for Success

The Customer is the Next Operation



Touch Labor



Plan & Design in Quality



Non-Touch Labor



Make Quality Decisions



Supervisor & Managers



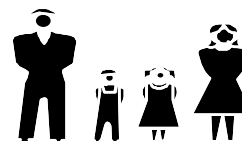
Select Quality Before Schedule & Profits



CEO, VP & Directors



Demand & Buy Only Quality



Owners & Public

Thank You for Listening

References:

- Principles of Quality Costs (ASQ)
- Guide for Reducing Quality Costs (ASQ)
- Quality without Tears, Crosby
- Quality Cost Analysis: Benefits & Risks, Kaner
- Quality Control Handbook, Juran

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