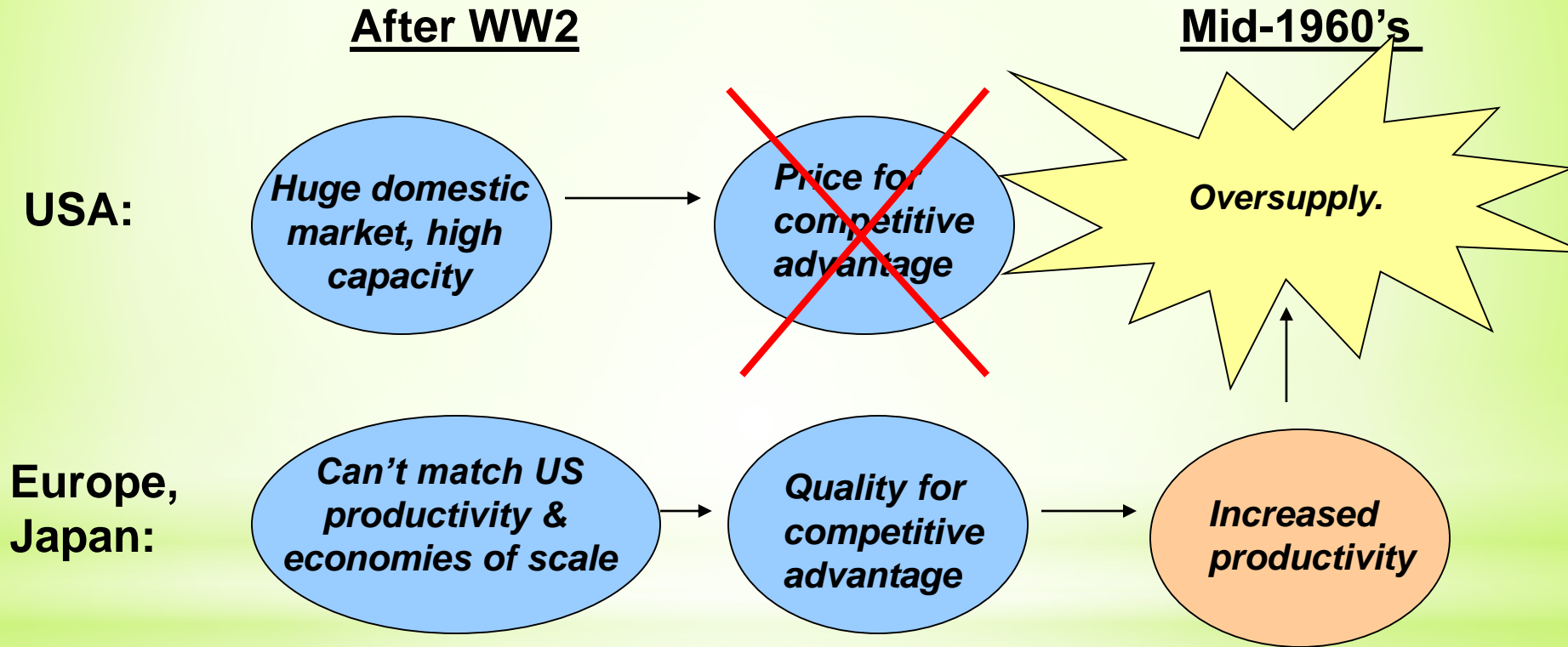




# Quality Management

Module 5

# \* “Isn’t it nice when things just work?”



# \* *Quality Management*

“It’s not necessary to change;  
survival is not mandatory”

- Deming

# \* Importance Of Quality

- \* More than **90%** of Dissatisfied Customers NEVER Again Do Business with the Offending Organization
- \* The Average Customer who has a Problem Tells **Nine** Others
- \* Attracting a New Customer Costs **Five to Six** Times as Much as Keeping the Current Customer

# \* Defining Quality

- \* **Quality**: the ability of a product (a good or a service) to consistently meet or exceed customer expectations
- \* **Ability**: the competence, either native or acquired, that enables one to do something well
- \* **Consistently**: refers to a reliable or steady pattern of performance
- \* **Expectations**: a state of anticipation about a future outcome

# \*Quality: Goods vs. Services

- \*1. Goods → Tangible Products. Quality relates to specifications, features, functions, etc.
- \*2. Services → Intangible goods = Intangible Factors



# \*Quality of Goods

1. Performance - operating characteristics
2. Features - “bells and whistles”
3. Reliability - time until/between breakdowns
4. Durability - needs replacement when?
5. Conformance - characteristics meet established standards
6. Serviceability - ease of maintenance
7. Aesthetics - overall appearance/appeal
8. Perceived Quality - perceptions/reputation

# \* Quality of Services

## Unique Issues:

- \* 1. Tangibles → Ambiance, beauty, etc.
- \* 2. Responsiveness → How quickly customer needs are met
- \* 3. Assurance → Confidence in service provider
- \* 4. Empathy → Ability to recognize specific needs of customer



# \* Different Types of Quality

		<i>Quality of market research</i>
	<i>Quality of design</i>	<i>Quality of concept</i>
		<i>Quality of specification</i>
		<i>Technology</i>
	<i>Quality of conformance</i>	<i>Employees</i>
		<i>Management</i>
<i>Customer satisfaction</i>		<i>Reliability</i>
	<i>Availability</i>	<i>Maintainability</i>
		<i>Logistical support</i>
		<i>Promptness</i>
	<i>Field service</i>	<i>Competence</i>
		<i>Integrity</i>

# \* *Costs of Quality*

## *Costs to obtain good quality*

Prevention

- design
- training

Appraisal

- inspection
- testing

## *Costs resulting from poor quality*

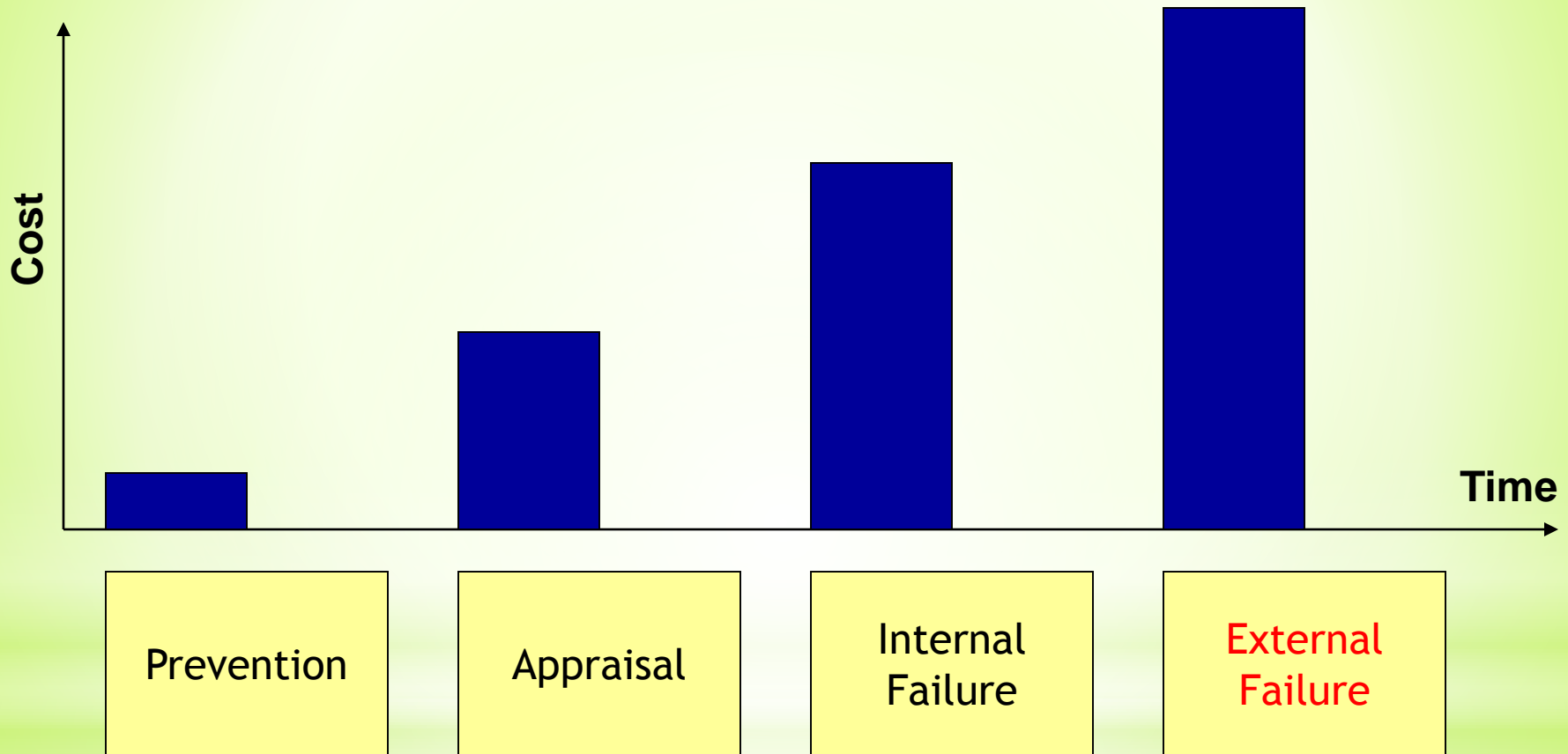
Internal Failure

- scrap
- rework

External Failure

- warranty costs
- loss of goodwill

# \* *Costs of Quality*



**Note: the closer a failure is to the customer the more expensive it is!!**

# \* *Importance to the Bottom Line*

$$\text{Profit} = \text{Revenue} - \text{Cost}$$

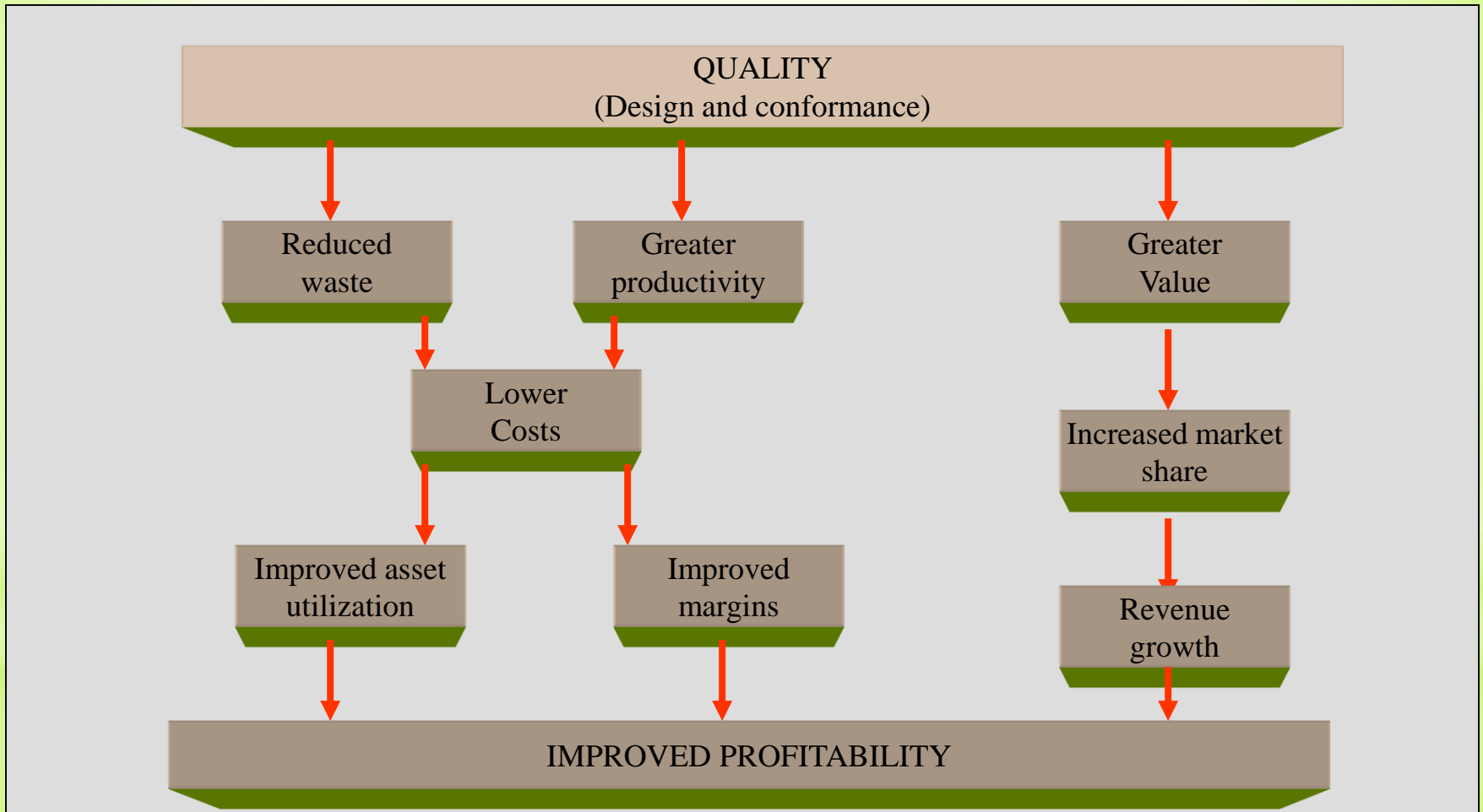
→ Revenue is a function of quality

- ↑ Quality → ↓ Demand elasticity → ↑ Prices → ↑ Revenue
- ↑ Quality → ↑ Perceived value → ↑ Market share → ↑ Revenue

→ Cost is a function of quality

- ↑ Quality → ↑ Productivity → ↓ Costs

# \* How Quality Contributes to Profitability



# \* Why is Process Improvement Important?

\* North American Automakers

**PRODUCED** 15 million Vehicles in 2004 ----  
and **RECALLED** 25 million.

2014:

Toyota - 6.4 million in April and 2.7 in June

Chevy - 13.8 million by May



# \*What is a Quality Process?

\*Quality Process

\*A Process that Produces Error-free Products

\*Because of Variation, No Process Produces Error-free Products. So, What Percentage of Defects is Acceptable?

10 % ?

5 % ?

1 % ?

# \* When 99.9% Quality is Not Enough

- \* Two million documents would be lost by IRS each year
- \* 22,000 checks would be deducted from the wrong bank account in the U.S.
- \* 1,314 phone calls in the U.S. would be misrouted each day
- \* 12 babies would be given to the wrong parents each day

# \* How Much Quality is Enough?

- \* 1999: 98,000 deaths from medical errors in the U.S., 7000 from medication errors.
- \* Hospitals commit 400,000 preventable drug errors each year.<sup>1</sup> Average is 1 per patient per day.
- \* 3 to 8 percent of prescriptions are filled incorrectly in U.S.<sup>2</sup>

# \* How Much Quality is Enough?

- \* Only 80 percent of hospitals in the U.S. have procedures in place to avoid operating on the wrong body parts. (i.e. 20 percent do not!)
- \* IRS agents give bad or no information 43 percent of the time (in 2002 study by Dept. of Treasury). Guess who is responsible if you use the bad information?

# \* Is 99% Correct Good Enough?

- \* 20,000 Wrong Prescriptions Each Year
- \* 15,000 Babies Dropped by Doctors Each Year
- \* 2 Short or Long Landings at Airports Daily
- \* 500 Incorrect Surgeries Weekly
- \* 2,000 Lost Pieces of Mail Each Hour!
- \* GE, Motorola, and Others Want to be Correct  
~99.99966% of the Time --- Thus, only 3.4  
Defects per 1 Million Opportunities
- \* This Is a Six Sigma Standard !

# \* Overview



- Total Quality Management
  - Quality
    - What is it?



# \* Overview



- **Total Quality Management**
  - **Quality**
    - What is it?
    - Dimensions
    - Cost / Importance
  - **Quality Gurus**
  - **Continuous improvement**

# \* Managing Quality

- \* 1. **Total Quality Management (TQM)**
  - \* A. Term for quality management system that addresses all areas of an organization
  - \* B. Emphasizes customer satisfaction and uses continuous improvement tools and techniques.
  
- \* 2. Elements of TQM
  - \* A. Employee participation
  - \* B. Customer focus
  - \* C. Management by fact
  - \* D. Continuous improvement

# \* *Total Quality Management (TQM)*

- **Total** : integrated into all business functions
- **Quality** : meeting or exceeding customer expectations
- **Management** : improving business systems/processes

**“Managing the entire organization so that it excels on all dimensions of products and services that are important to the customer.”**

# \* Quickly Count the “F’s”

Count the F's in the sentence below.

Count them ONLY ONCE.

Do not go back and count them again

**“FINISHED FILES ARE THE RESULT OF YEARS OF SCIENTIFIC STUDY COMBINED WITH THE EXPERIENCE OF YEARS.”**

\* Inspection doesn't always  
work

# \* Quickly Count the “F’s”

FINISHED FILES ARE THE RESULT OF  
YEARS OF SCIENTIFIC STUDY  
COMBINED WITH THE EXPERIENCE  
OF YEARS.

Average # of F’s found is 3. There  
are actually 6

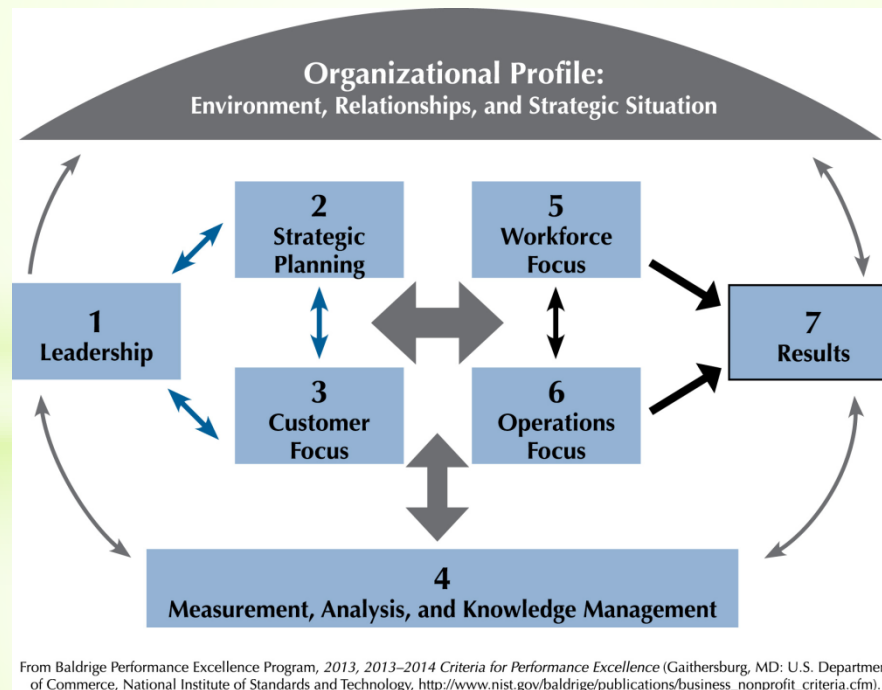


# \* Root Causes of Quality Problems

- \* “...most quality problems are caused by poor systems, not by the workers.”
- \* Deming: 90 percent of quality problems are caused by management.
- \* J.D. Power: at least 2/3 of the long-term quality problems in autos are engineering and design problems.

# \* Managing Quality

- \* 1. Malcolm Baldrige National Quality Award (MBNQA) → Premiere award recognizing quality in the United States



# \* Managing Quality

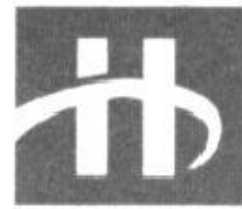
- \* W. Edwards Deming (b. 1900- d.1993)
- \* 1. Known as “father” of quality management
- \* 2. Developed “14 Points”
- \* 3. Highlights of “14 Points”
  - \* A. (3) Cease dependence on inspection
  - \* B. (4) Reduce cost by reducing variation
  - \* C. (6) Training
  - \* D. (8) Drive out fear
  - \* E. (10) Eliminate slogans



# \* Dimensions of Quality



*Who is 42?*



**Hanes**<sup>TM</sup>

Look for these  
other quality  
Hanes<sup>®</sup> products:

- Sweats
- T-Shirts
- Socks
- Gloves

---

THIS GARMENT  
INSPECTED BY

**42**

# Who is 4?



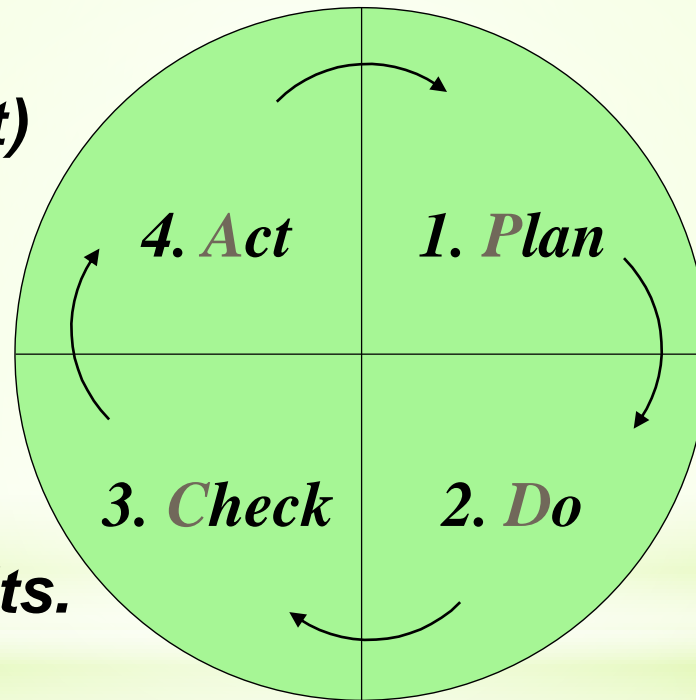
Nothing cures a case of overthinking like a dose of sarcasm.



# \* *The Deming Wheel:*

***Institutionalize  
the change (or  
abandon/repeat)***

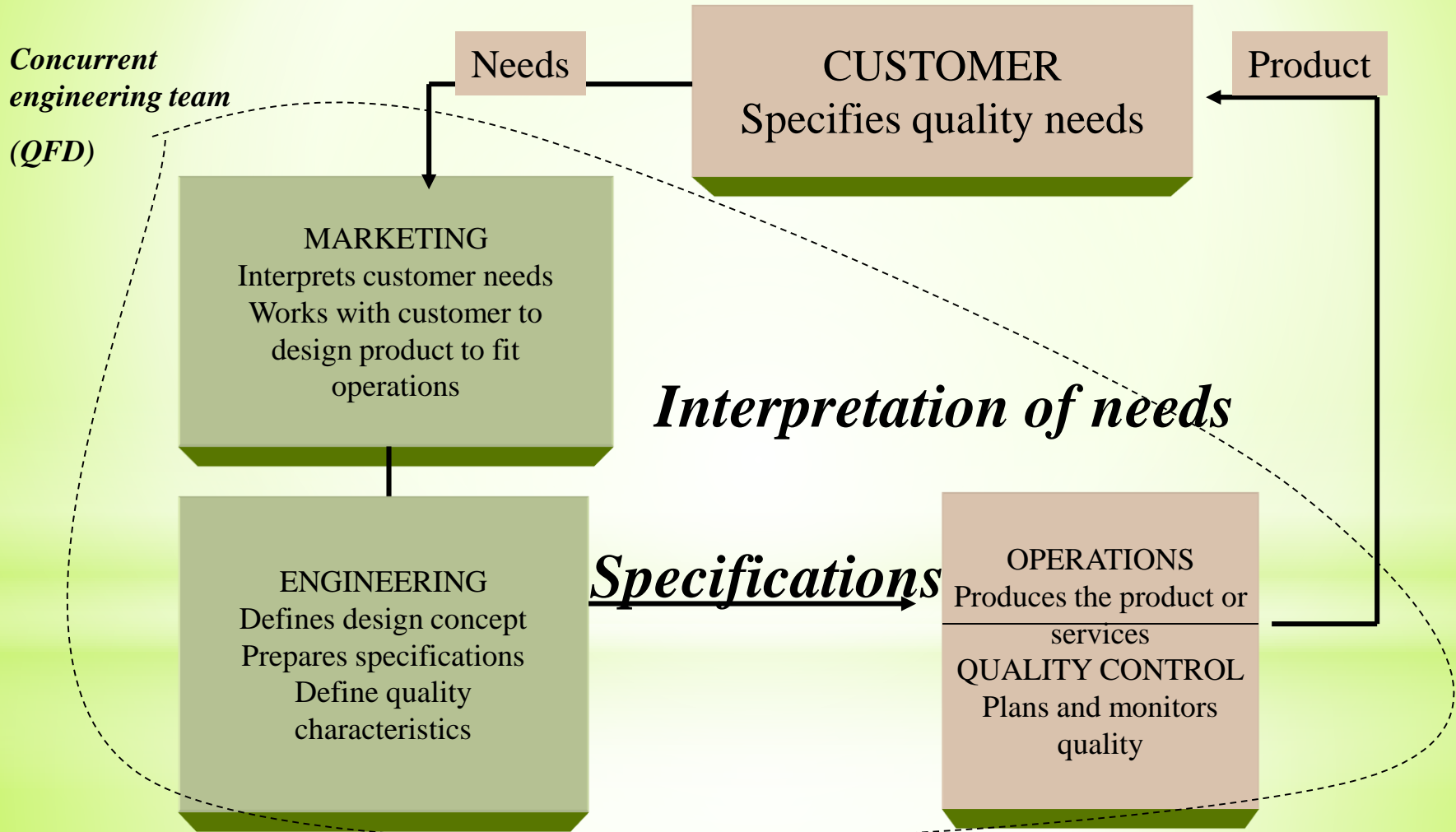
***Plan a change  
aimed at  
improvement.***



***Study the results.  
Did it work?***

***Execute the  
change.***

# \*The Quality Cycle



# \* Implementation of quality improvement through the quality cycle

1. Define quality attributes on the basis of customer needs
2. Decide how to measure each attribute
3. Set quality standards
4. Establish appropriate tests for each standards
5. Find and correct causes of poor quality
6. Continue to make improvements

# \*Even with proactive planning...

... problems can still come up.

**That's OK, as long as we address them by stepping in the right direction toward total quality.**

# \*Continuous Improvement

1. Small changes in processes to improve long run quality
2. Requires worker involvement & process monitoring

# \*Continuous Improvement

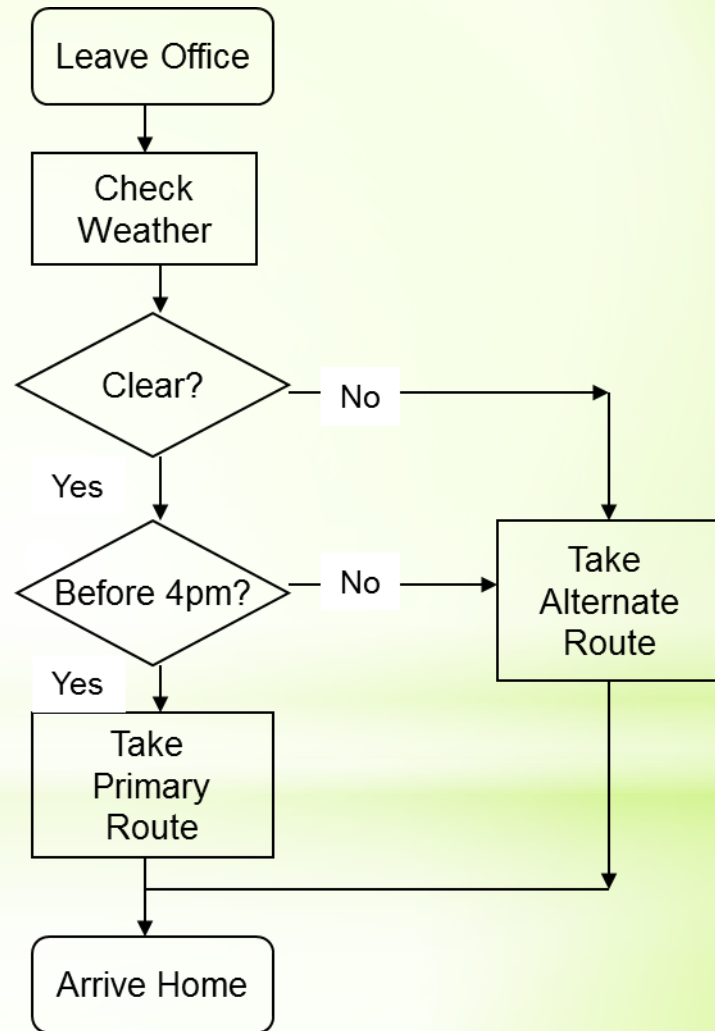
## \*Seven Tools

- \*1. Process flow charts
- \*2. Cause and effect diagrams
- \*3. Control charts
- \*4. Histograms
- \*5. Check sheet
- \*6. Pareto charts
- \*7. Scatter diagrams (and run charts)



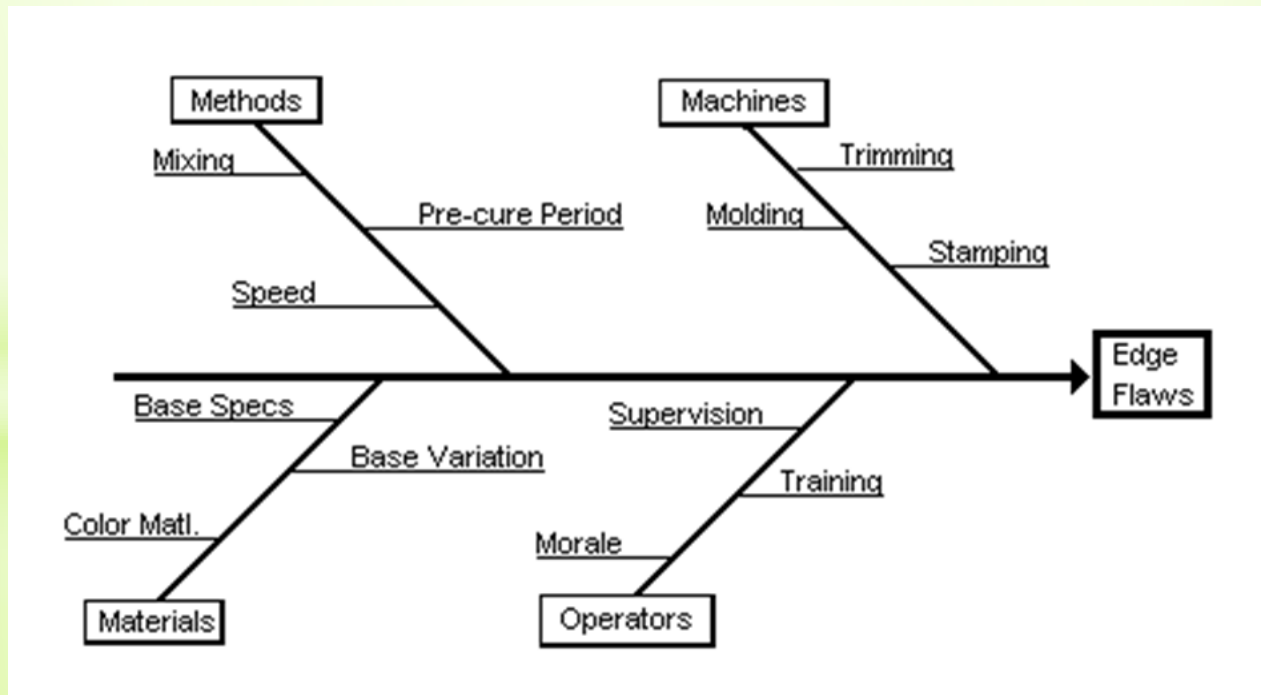
# \* Process Flow Chart

- \* 1. Traces flow and sequence of operations in a process
- \* 2. Helpful to identify non-value adding activities



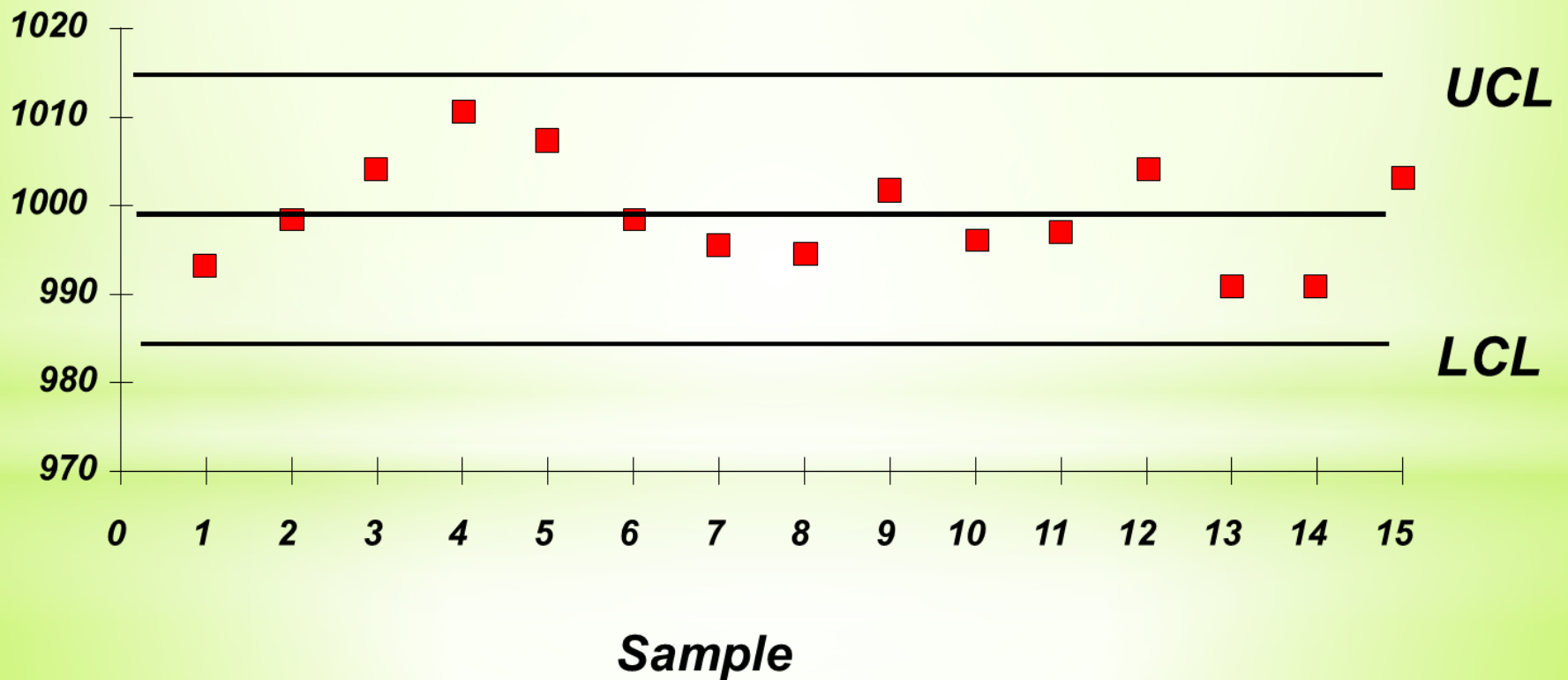
# \* Cause and Effect Diagram

- \* 1. Illustrates range of possible causes that lead to an outcome (a.k.a. Fishbone or Ishikawa diagram)



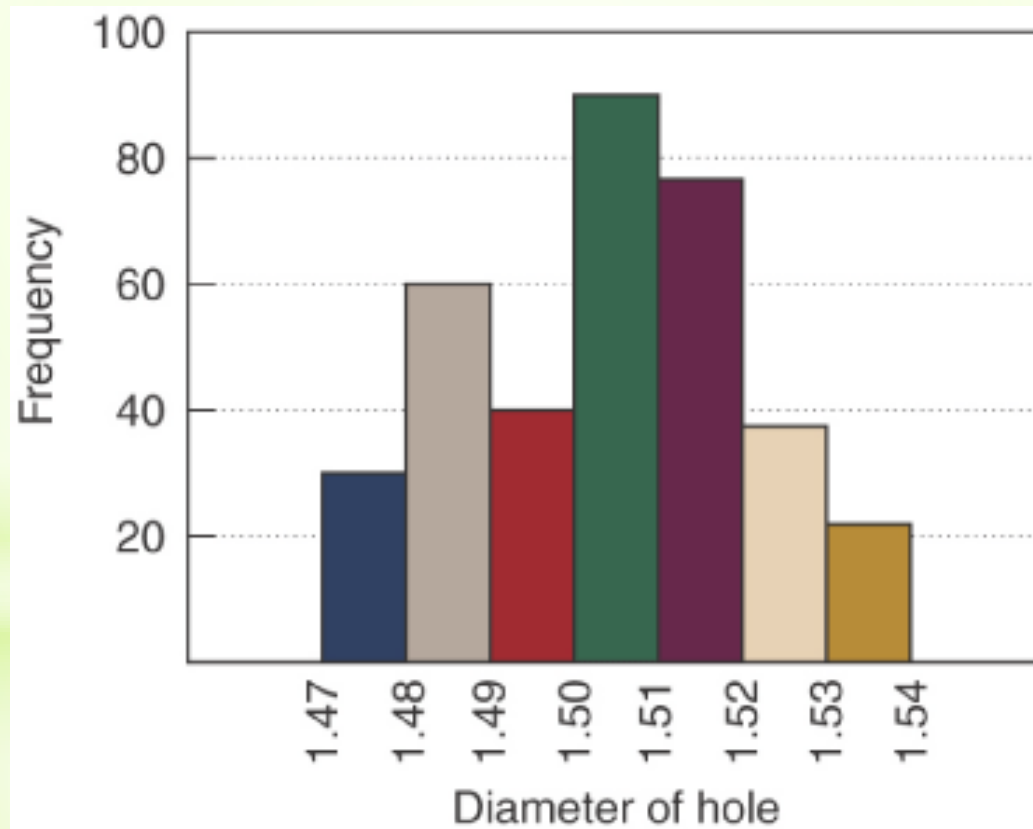
# \* Control Charts

\* 1. Used to show process trends



# \* Histogram (of Hole Diameters)

Shows frequency and distribution of data



# \* Checksheet for Recording Complaints

Type of Complaint	Frequency
Cord too short	IIII
Dirt bags hard to change	IIII
Too heavy	IIII
Breaks down a lot	IIII
Accessories don't always work	IIII
Other	IIII

# \* Checksheet for Group Sizes in a Restaurant

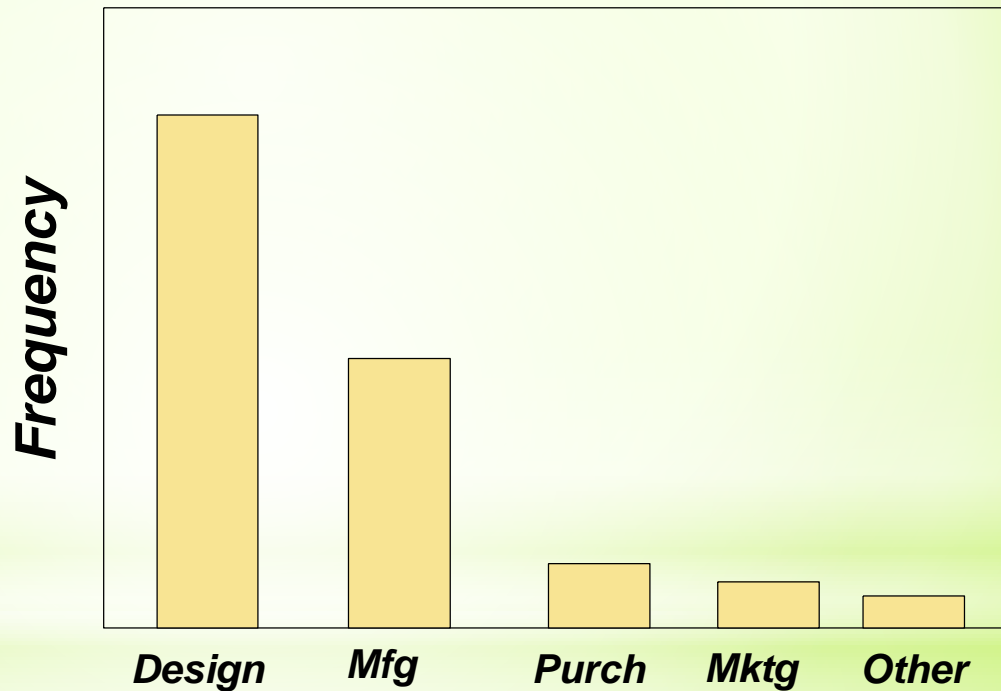
Customers in Party	Count
1	
2	
3	
4	
5	
6	
>6	



# \* Pareto Analysis

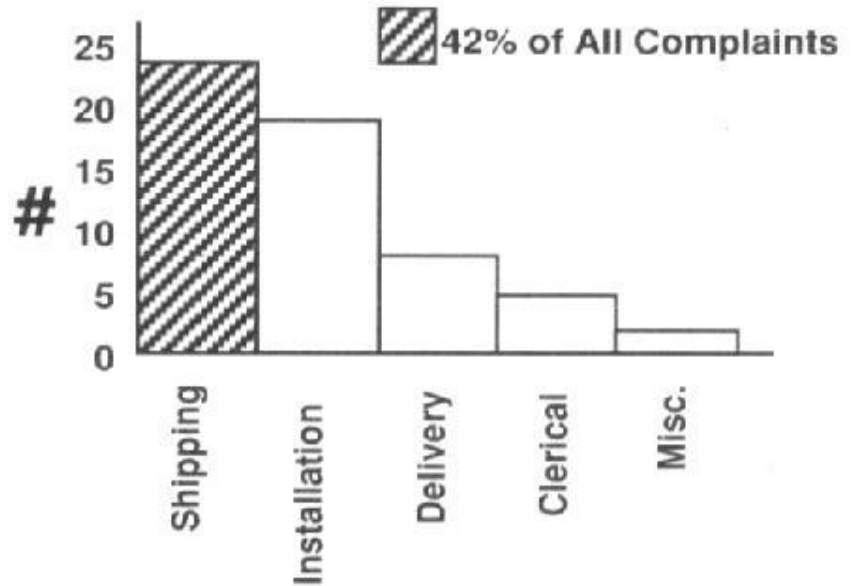
*Ranking of causes from most to least significant*

80% of the problems may be attributed to 20% of the causes.

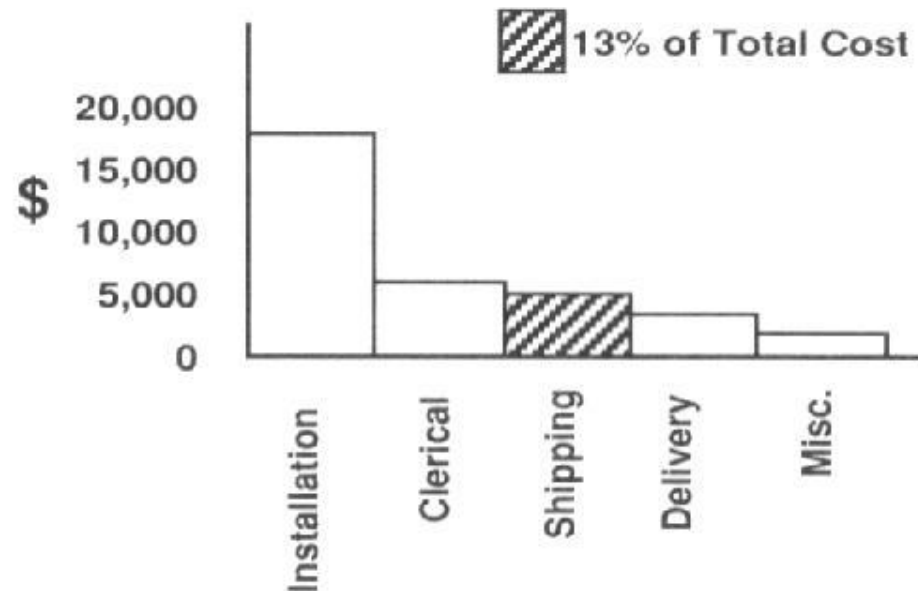


*\* Pareto  
Charts to  
Set  
Priorities*

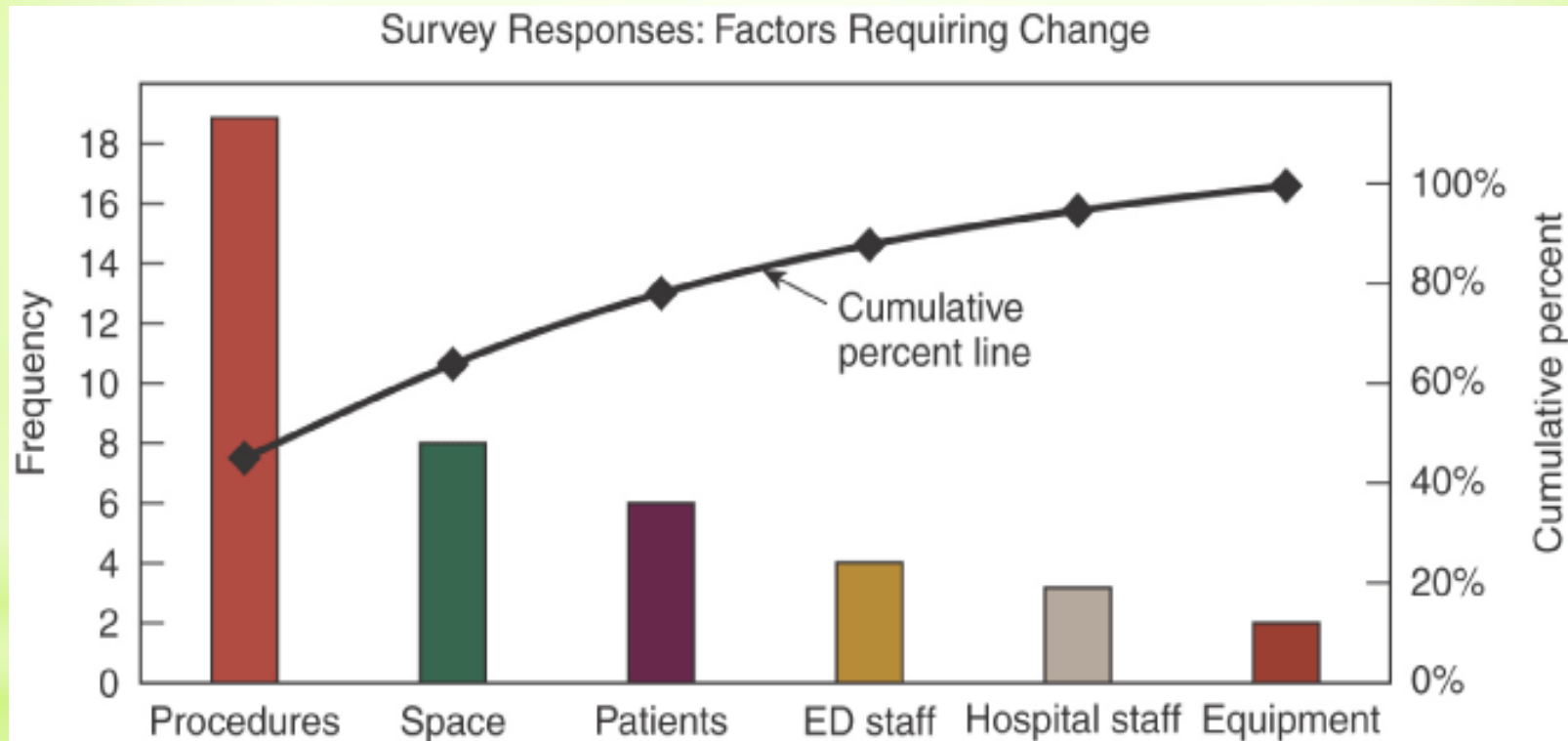
### Field Service Customer Complaints:



### Cost To Rectify Field Service Complaints:

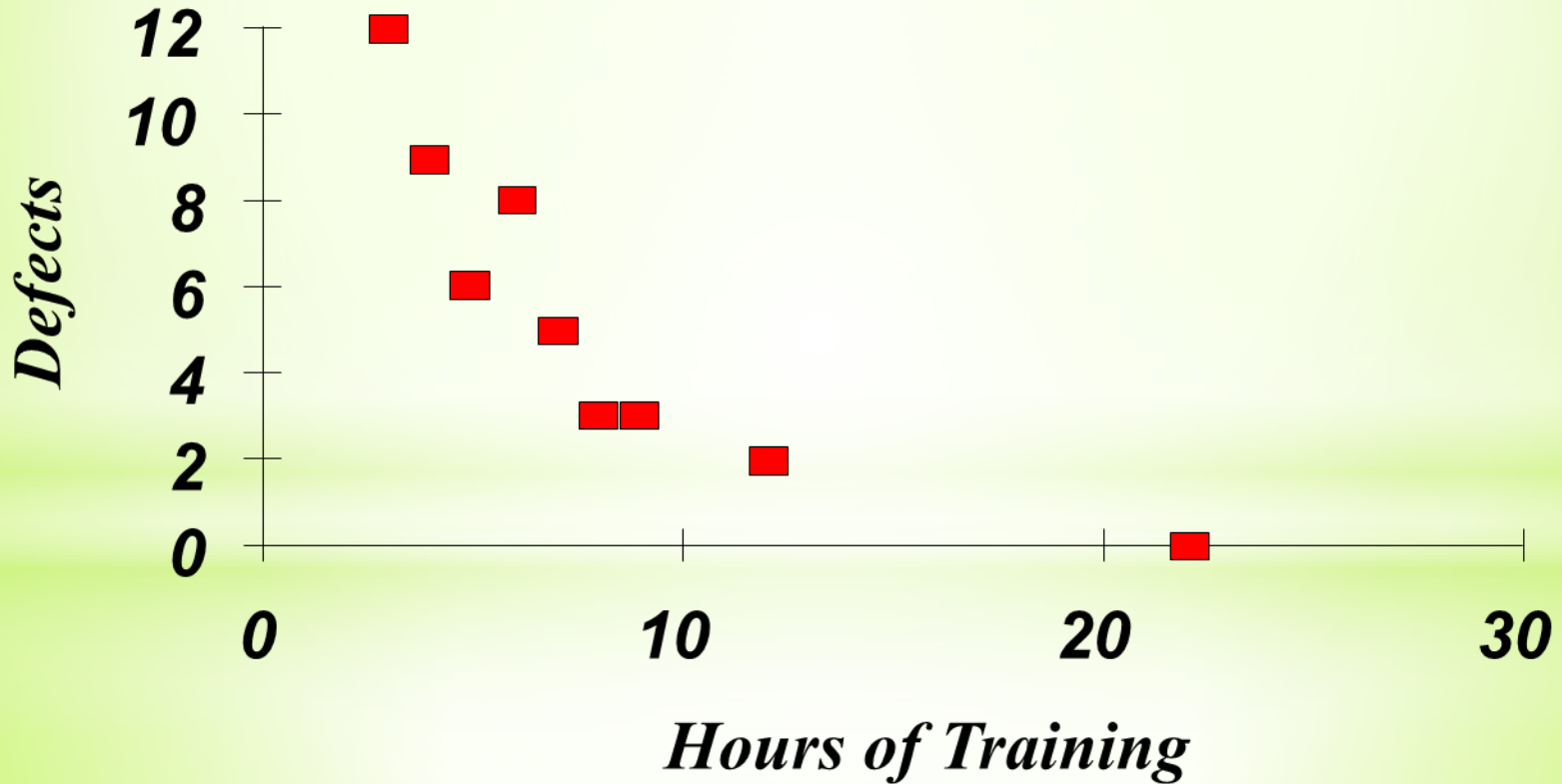


# \* Pareto Chart of Factors in an Emergency Room

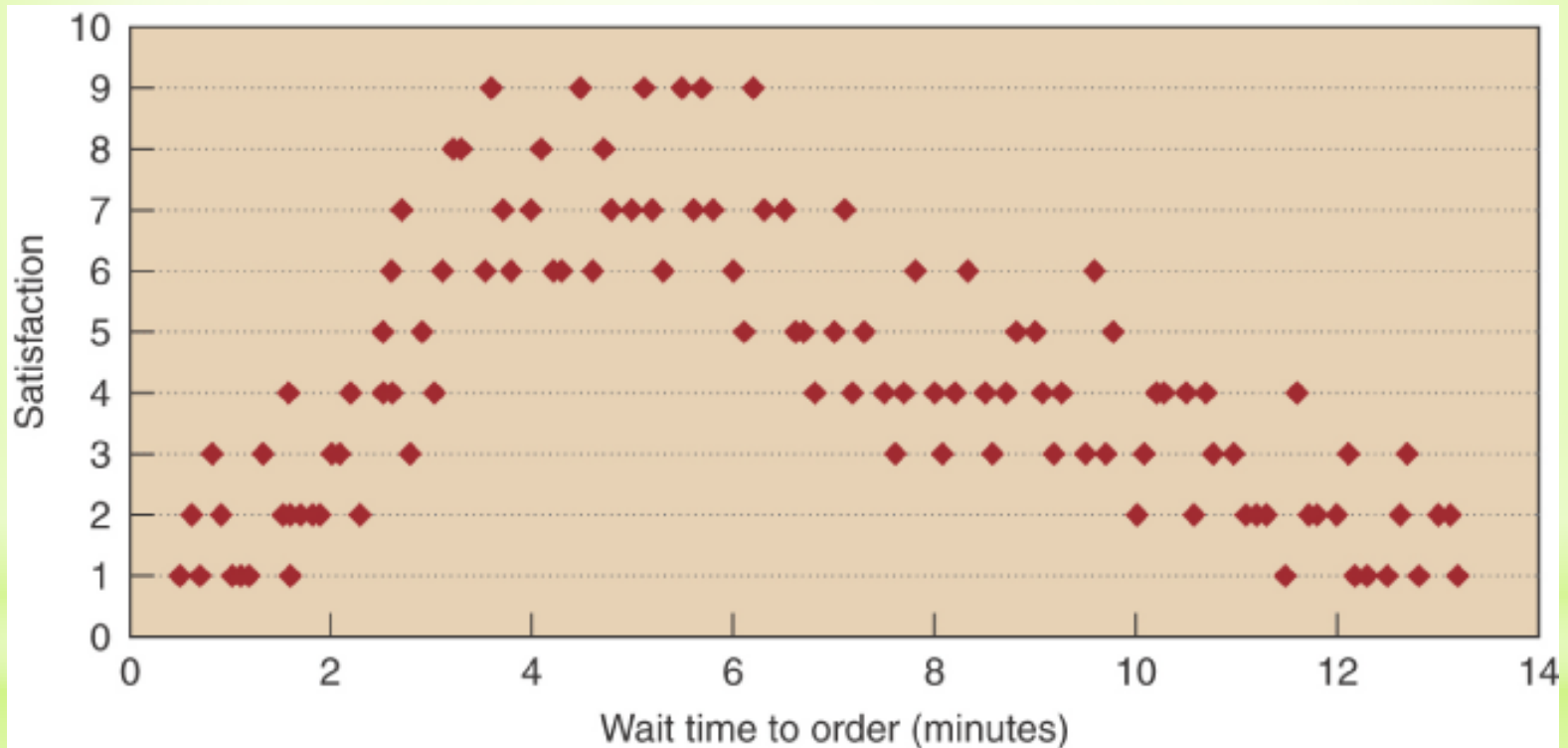


# \* Scatter Diagram

- \* 1. Identify Relationships Between 2 Variables



# \* Scatterplot of Customer Satisfaction and Waiting Time in an Upscale Restaurant



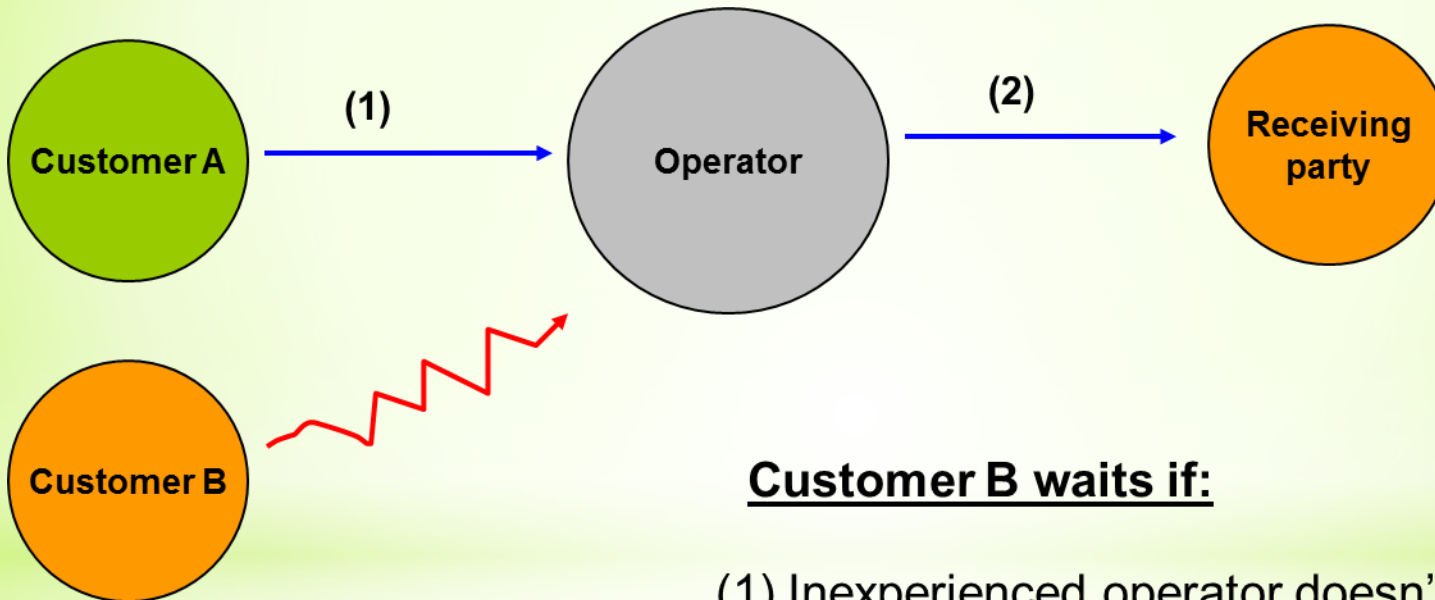
# \* Example

- \* Main office of a large bank
  - \* 500 customer calls/day
  - \* Caller irritation if phone rings 5x before answer
- \* Telephone reception importance:
  - \* First impression of a business
  - \* Company slogan “Don’t make customers wait”
  - \* Company wide campaign to “be more friendly”



# \*Example

## \*Why Customers Wait

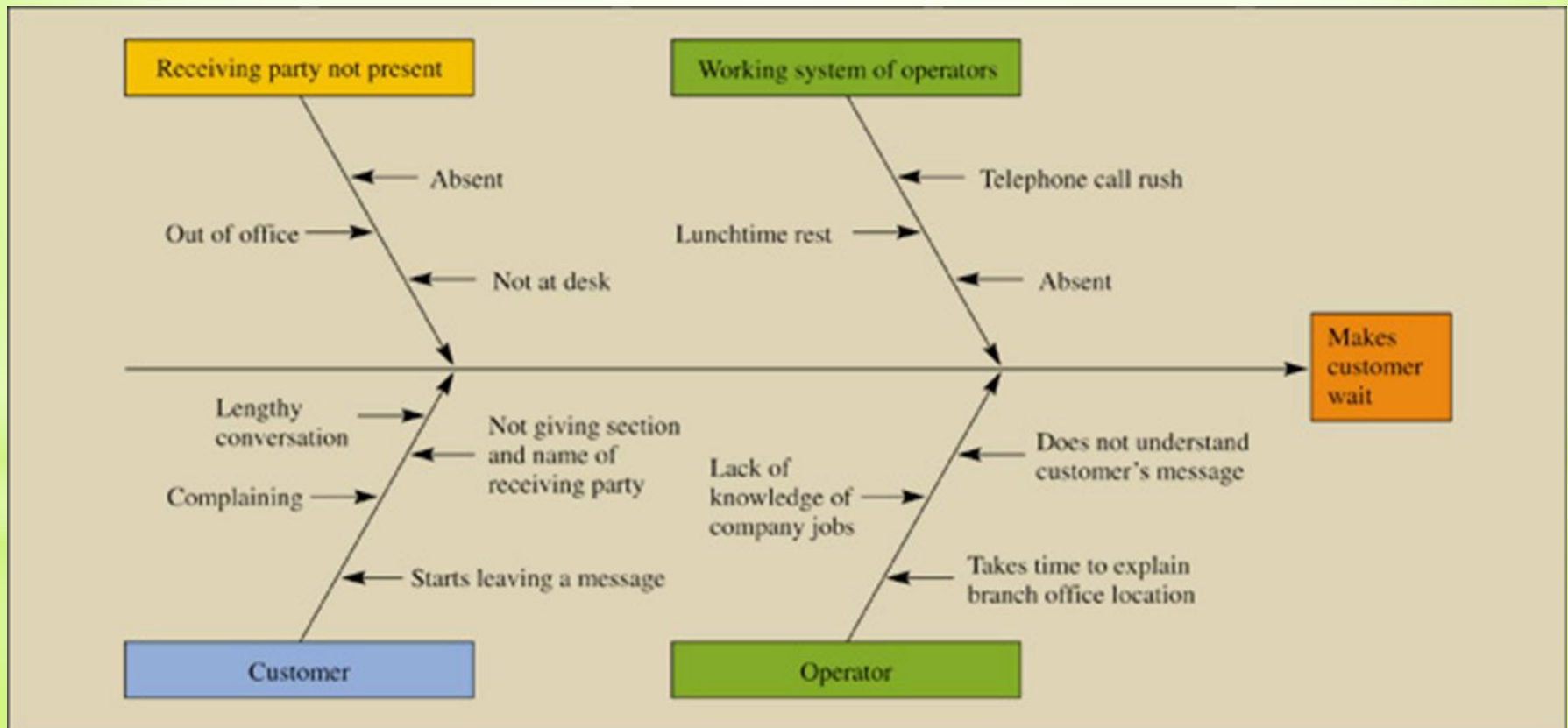


### Customer B waits if:

- (1) Inexperienced operator doesn't know where to connect the Customer A's call
- (2) Receiving party cannot answer the phone quickly

# \* Example

## \* Cause and Effect Diagram



# \* Example

## \* Checksheet Analysis

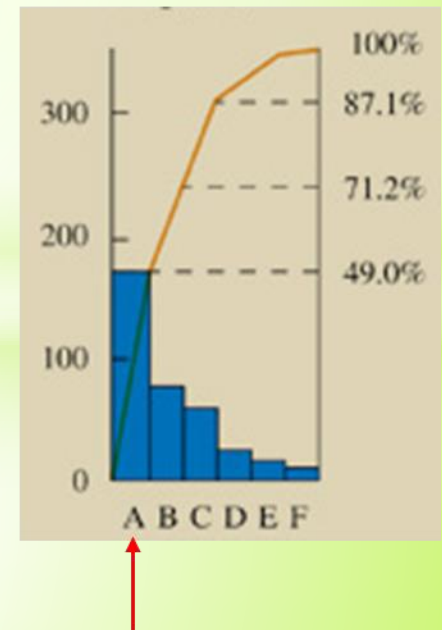
Date	REASON			TOTAL
	NO ONE PRESENT IN SECTION RECEIVING THE CALL	RECEIVING PARTY NOT PRESENT	ONLY ONE OPERATOR (PARTNER OUT OF THE OFFICE)	
June 4		### I	### ### I	24
June 5	###	###	### ###	32
June 6	### I		### ###	28
June 15	###	###	###	25



		DAILY AVERAGE	TOTAL NUMBER
A	One operator (partner out of the office)	14.3	172
B	Receiving party not present	6.1	73
C	No one present in the section receiving the call	5.1	61
D	Section and name of receiving party not given	1.6	19
E	Inquiry about branch office locations	1.3	16
F	Other reasons	0.8	10
Total		29.2	351



Pareto Diagram



# \*Example

- \*Solutions?
- \*How to Reduce Number of Waiting Callers?
  - \*1. Ensure more than one operator on duty
    - \*Rolling lunch shifts
  - \*2. Simplify operator duties
    - \*Notify operator if employee away from desk
    - \*Compile directory of employees

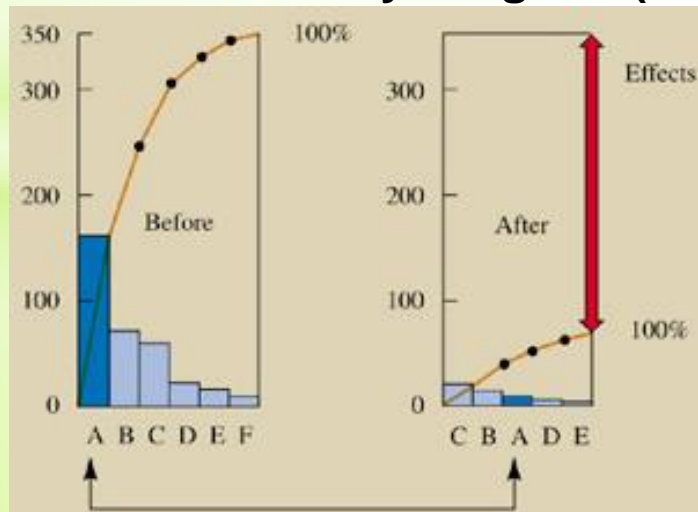
# The solution

## Number of waiting callers before and after Quality Program

REASON WHY CALLERS HAD TO WAIT		TOTAL NUMBER BEFORE AFTER		DAILY AVERAGE BEFORE AFTER	
A	One operator (partner out of the office)	172	15	14.5	1.2
B	Receiving party not present	73	17	6.1	1.4
C	No one present in the section receiving the call	61	20	5.1	1.7
D	Section and name of receiving party not given	19	4	1.6	0.3
E	Inquiry about branch office locations	16	3	1.3	0.2
F	Others	10	0	0.8	0
Total		351	59	29.2	4.8

Period: 12 days from Aug. 17 to 30.

## Effects of Quality Program (Pareto Diagram)





# \*Service Quality

- \*The SERVQUAL system is one method used to measure quality in services. It has five dimensions:
  - \*Tangibles
  - \*Reliability
  - \*Responsiveness
  - \*Assurance
  - \*Empathy



# \* ISO 9000

- \* Guidelines for designing, manufacturing, selling, and servicing products.
- \* Selecting an ISO 9000 certified supplier provides some assurance that supplier follows accepted business practices in areas covered by the standard.
- \* Required by many companies, esp. in Europe, before one can be a supplier.
- \* [www.iso.ch](http://www.iso.ch)

# ISO 9000 Audit

WE'RE HAVING  
AN ISO 9000  
AUDIT THIS  
WEEK.



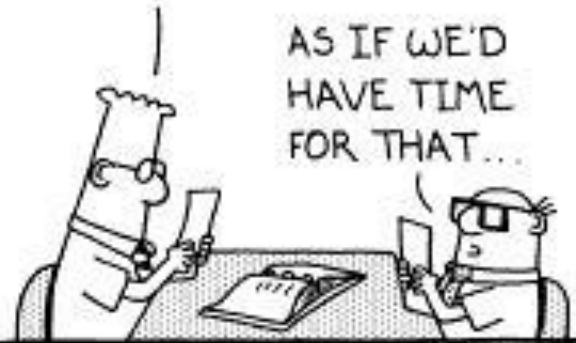
S. Adams E-mail: SCOTTADAMS@AOL.COM

TAKE A LOOK AT YOUR  
DOCUMENTED JOB  
DESCRIPTIONS AND  
MAKE SURE THAT IT'S  
WHAT YOU'RE DOING  
IF THE AUDITOR ASKS.



ACCORDING TO  
THIS I'M SOME  
SORT OF  
ENGINEER..

AS IF WE'D  
HAVE TIME  
FOR THAT...

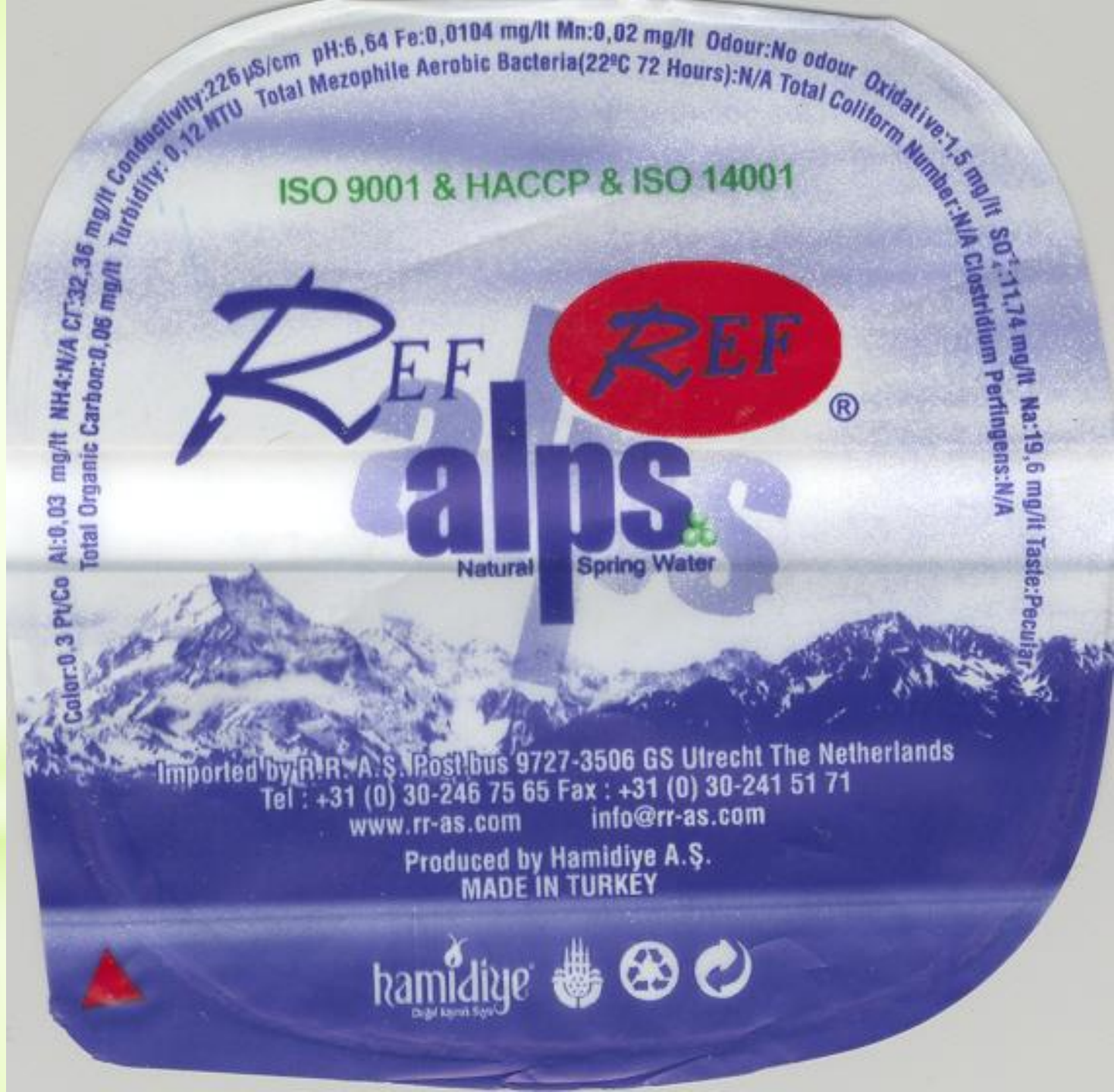


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- *Document what you do...*
- *Do what you say you do.*

**Turkish bottled water served on a Dutch airline**





# St. Luke's Hospital earns ISO 9001:2000 certification

Following a three-day audit in May, St. Luke's Hospital was recently informed that it has earned ISO 9001:2000 certification status.

"We are just the second health care organization in Ohio, and the first in the greater Toledo area, to earn this certification," stated Frank J. Bartell III, St. Luke's president / CEO. "We are truly proud of achieving this designation."

ISO is the recognized name for International Organization for Standardization, which promotes the development of standards, testing, and certification to ensure quality products and services. Certification is more common in manufacturing and industrial settings. St. Luke's is among a relatively small number of healthcare organizations nationwide to undergo the ISO 9001:2000 audit procedure, according to the hospital.

Maintaining ISO 9001:2000 certification is a continual process. St. Luke's will undergo an audit each year to retain its certification status.



St. Luke's ISO 9001:2000 certification comes after a successful survey by the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) in March. The JCAHO evaluates more than 17,000 healthcare organizations in the US each year as a means of testing their safety and quality procedures.

"Our ISO 9001:2000 certification and our accreditation by JCAHO tell our customers a few things about St. Luke's," stated Bartell. "We maintain the highest level of quality by continually evaluating and improving our internal processes. These improvement processes apply to everything from processing patient records to calibrating medical equipment to maintaining employment applications. We will continue to analyze our processes to ensure that they work for our customers and for our organization."



## Ingredients:

Wheat Flour, Date Paste,  
Butter, Sugar, Yeast

Keep in a Cool & Dry Place

Produced by:

**HALWANI BROS CO.**

P.O.Box 690, Jeddah 21421

Kingdom of Saudi Arabia

Design Reference: 16/03/08



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***Saudi cookies are ISO 9000 certified***



***Airports can be ISO 9000 certified***



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"Our best sign of quality  
will always be  
your smile."

**ISO  
9001**

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HOTEL

*Hotels the way you like them*

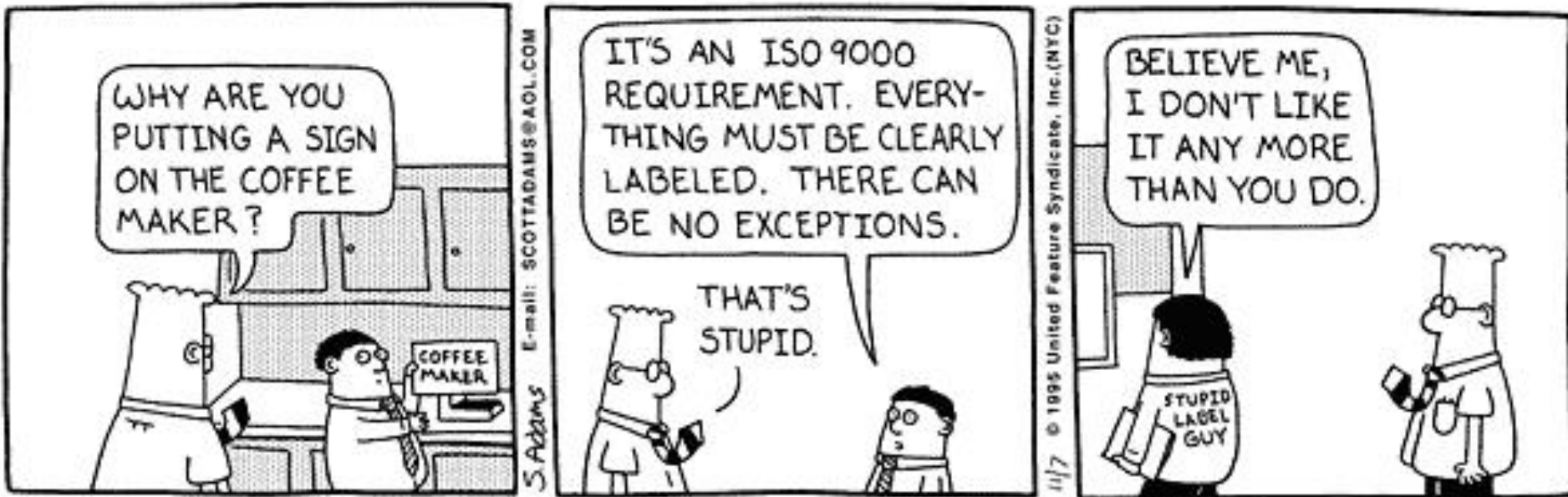
# \*The ISO 9000 Audit



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- ***Document what you do...***
- ***Do what you say you do.***

# \* ISO 9000



- ***Document what you do...***
- ***Do what you say you do.***



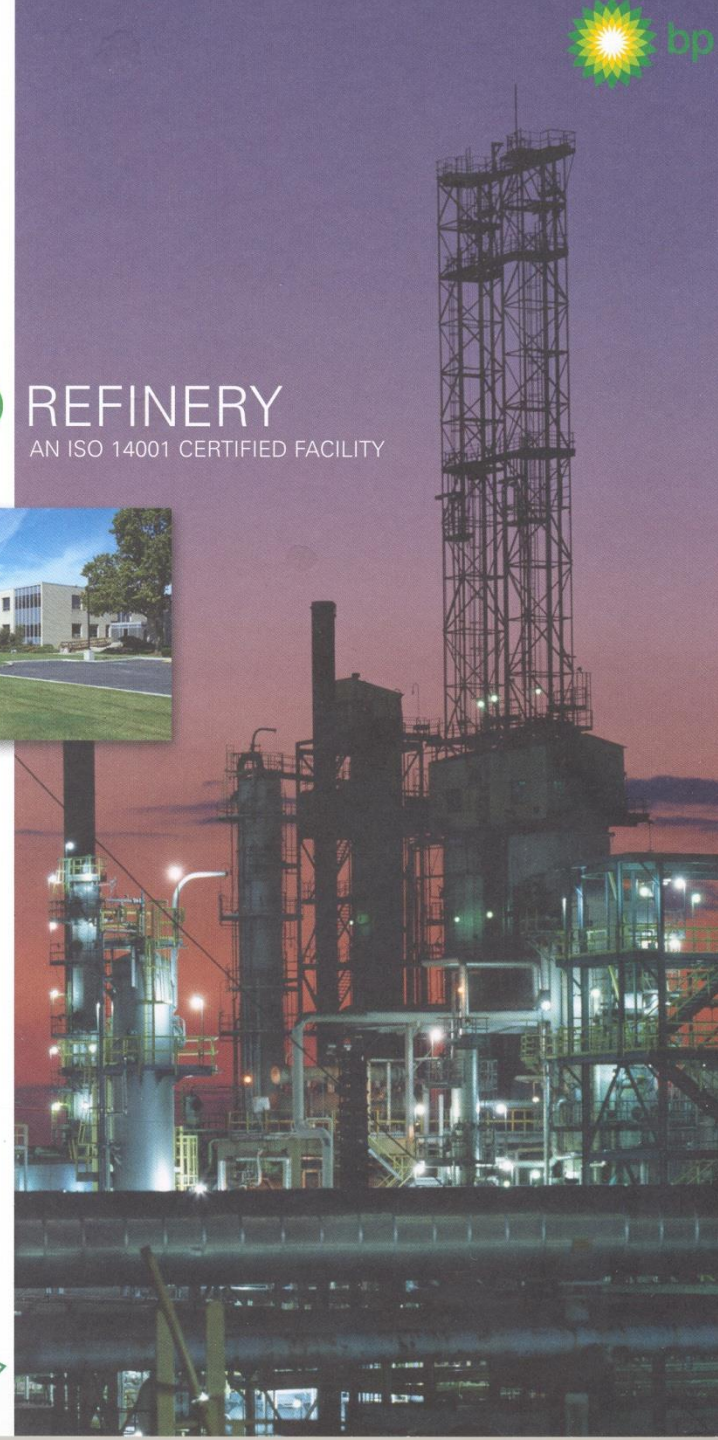
# \* ISO 14000

- \* Series of standards covering **environmental management systems**, environmental auditing, evaluation of environmental performance, environmental labeling, and life-cycle assessment.
- \* Intent is to help organizations improve their environmental performance through documentation control, operational control, control of records, training, statistical techniques, and corrective and preventive actions.



BP TOLEDO REFINERY  
AN ISO 14001 CERTIFIED FACILITY

***ISO 14001 is an environmental certification***



# \* Quality is not a new Idea



*The label on the bottles reads:*

*“Brewed according to the German Purity Regulations of 1516”*



# \*Summary

- \*What is quality?
- \*How may increased quality result in higher revenues or reduced costs?
- \*What are the standards or quality for goods versus services?
- \*What standard (99%?) is used in quality control?
- \*Steps important in quality improvement
- \*Tools to assist in continuous improvement
- \*Goal of ISO 9000/9001
- \*Goal of ISO 14000/140001