

Six Sigma



THE METHOD OF CHAMPIONS

Objectives

- Define “quality”
- Explain key performance objectives
- Define key quality terms
- Illustrate process improvement using Six Sigma
- List quality considerations at DTCC

What is “quality”?

- John Ruskin

Quality is never an accident; it is always the result of intelligent effort.

- Henry Ford

Quality means doing it right when no one is looking.

- Peter Drucker

Quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for.

- W. Edwards Deming

Quality is the result of work efforts divided by total costs.

- Jack Welch

Quality means reducing costs and increasing sales.

Key performance objectives



6σ

Six Sigma history

Six Sigma was

- Developed by Motorola and GE in 1980s to improve manufacturing processes
- Extended to financial services in late 1990s
- Adopted by DTCC in 2001



Key quality terms

Metric

Standard of measurement

Time to resolve a customer issue


Percentage of budget spent on design

Average phone hold time

Number of customer complaints

Customer acquisition and retention rates

Specific
Measurable
Attainable
Realistic
Timely
Trackable



Key quality terms

Defect

Failure to conform to requirements

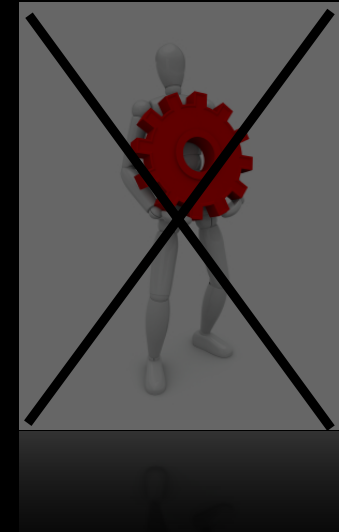
20% of customer issues resolved in more than 2 minutes

3.5% of budget spent on product redesign

10% of customers on hold for more than 30 seconds

5% more customer complaints per month

Drop in customer acquisition and retention rates by more than 0.5%



Key quality terms

Sigma (σ)

Measure of variability

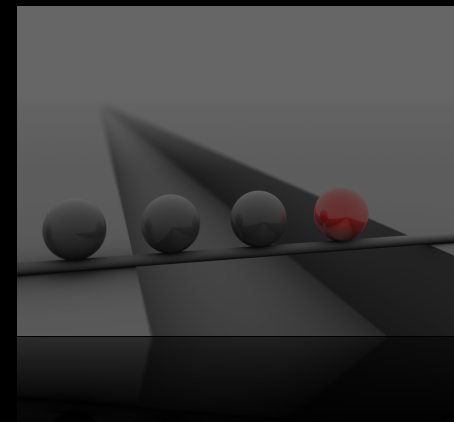
Time to resolve a customer issue: 2.34σ

Percentage of budget spent on product design: 3.31σ


Average phone hold time: 2.78σ

Number of customer complaints: 3.14σ

Customer acquisition and retention rates: 4.08σ



What is a sigma level?




σ	1	2	3	4	5	6
Defects per 1,000	690	308.5	66.8	6.21	0.23	0.034
Percentage yield	31%	69.15%	93.3193%	99.379%	99.9767%	99.99966%
Industry average			Apparel industry	Financial services	Car tire manufacturers	Airline safety Drug quality assurance

$$DPMO = \frac{(1,000,000 \times \text{Number of actual defects})}{(\text{Number of units} \times \text{Defect opportunities})}$$

↓
 σ = statistical conversion of DPMO

Comparison of sigma levels



σ	3	4	5	6
Defects per 1,000	66.8	6.21	0.23	0.034
Percentage yield	93.3193%	99.379%	99.9767%	99.99966%
Lost letters	133,600 per hour	12,420 per hour	466 per hour	6.8 per hour
Incorrect surgical operations	33,400 per week	3,100 per week	117 per week	1.7 per week
Short or long landings	13 each day	1 each day	17 each year	1 every 5 years
Wrong prescriptions	1,336,000 each year	124,200 each year	4,660 each year	68 each year

Examples are for illustration only and are based on U.S. data.

Sample process improvement

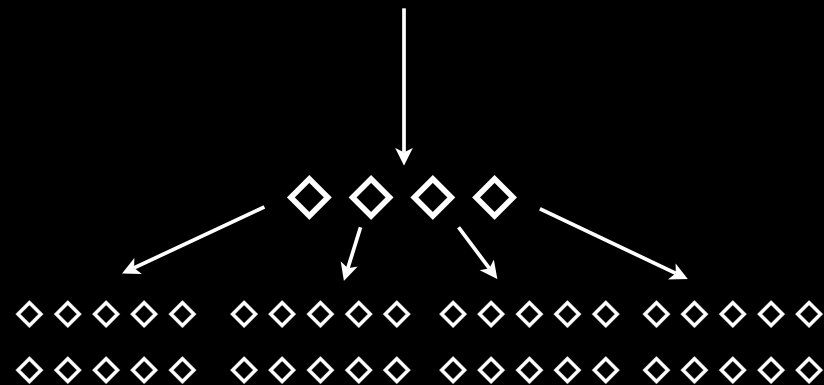
Annual post-payable adjustments

Rework
Fielding customer inquiries
Potential financial loss

7500 securities

4 participants per security

10 customers per participant



$$7500 \times 4 \times 10 =$$

300,000

security holders affected

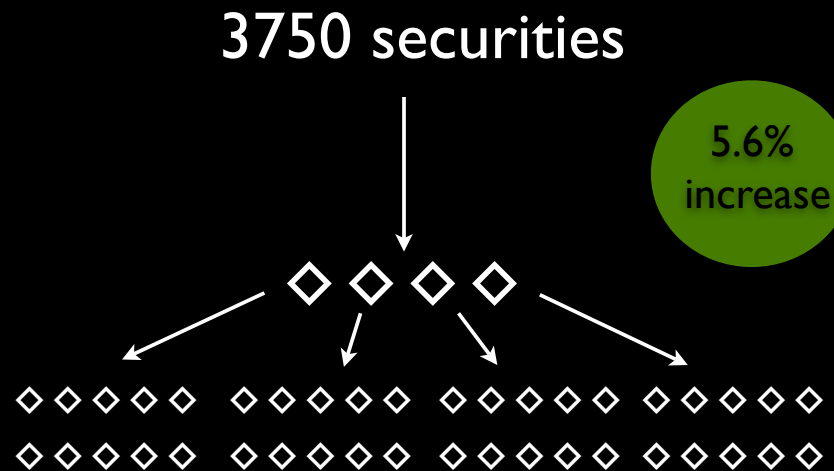
4.11σ

Sample process improvement

Annual post-payable adjustments

4 participants per security
10 customers per participant

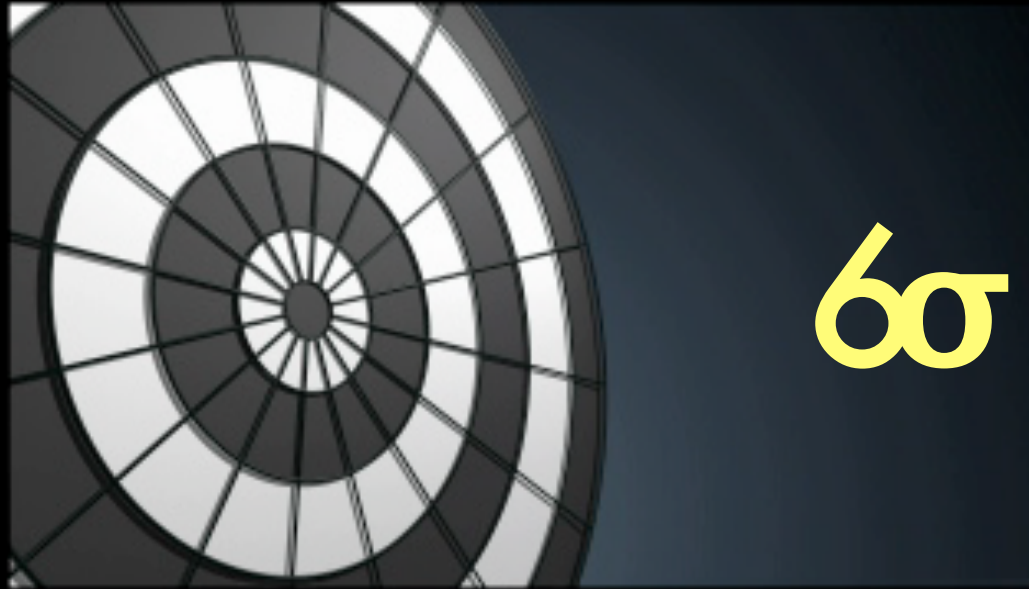
$$3750 \times 4 \times 10 =$$



150,000
security holders affected

4.34σ

Internal and external sigmas



Internal sigmas

External sigmas

Track and eliminate defects
caused internally

Track and partner to eliminate
defects caused externally

Six Sigma at DTCC

Since adopting Six Sigma in 2001, DTCC has

- Certified a cross-functional population of employees as belts (Yellow, Green, Black, and Master Black)
- Instituted Balanced Business Scorecard
- Won several global Six Sigma industry awards
- Launched process excellence initiative enterprisewide



The method of champions

DTCC

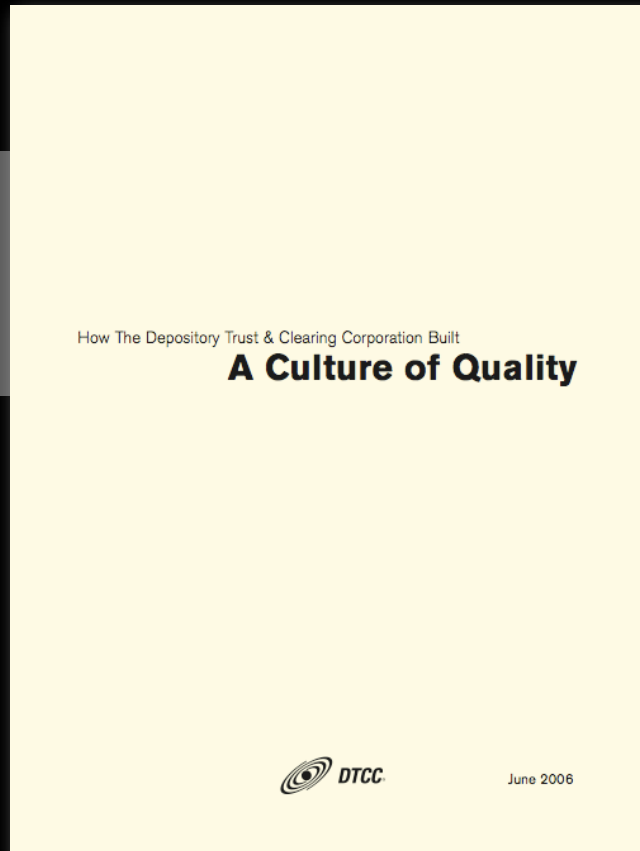
- Shares internal and external performance data with process partners
- Collaborates with process partners to improve industrywide business processes



Summary

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- Listed quality considerations at DTCC

Additional information



“How DTCC Built A Culture of Quality”

www.dtcc.com/leadership/research

For more information on DTCC’s quality program, contact your relationship manager or e-mail BusinessReengineeringAndQuality@dtcc.com.