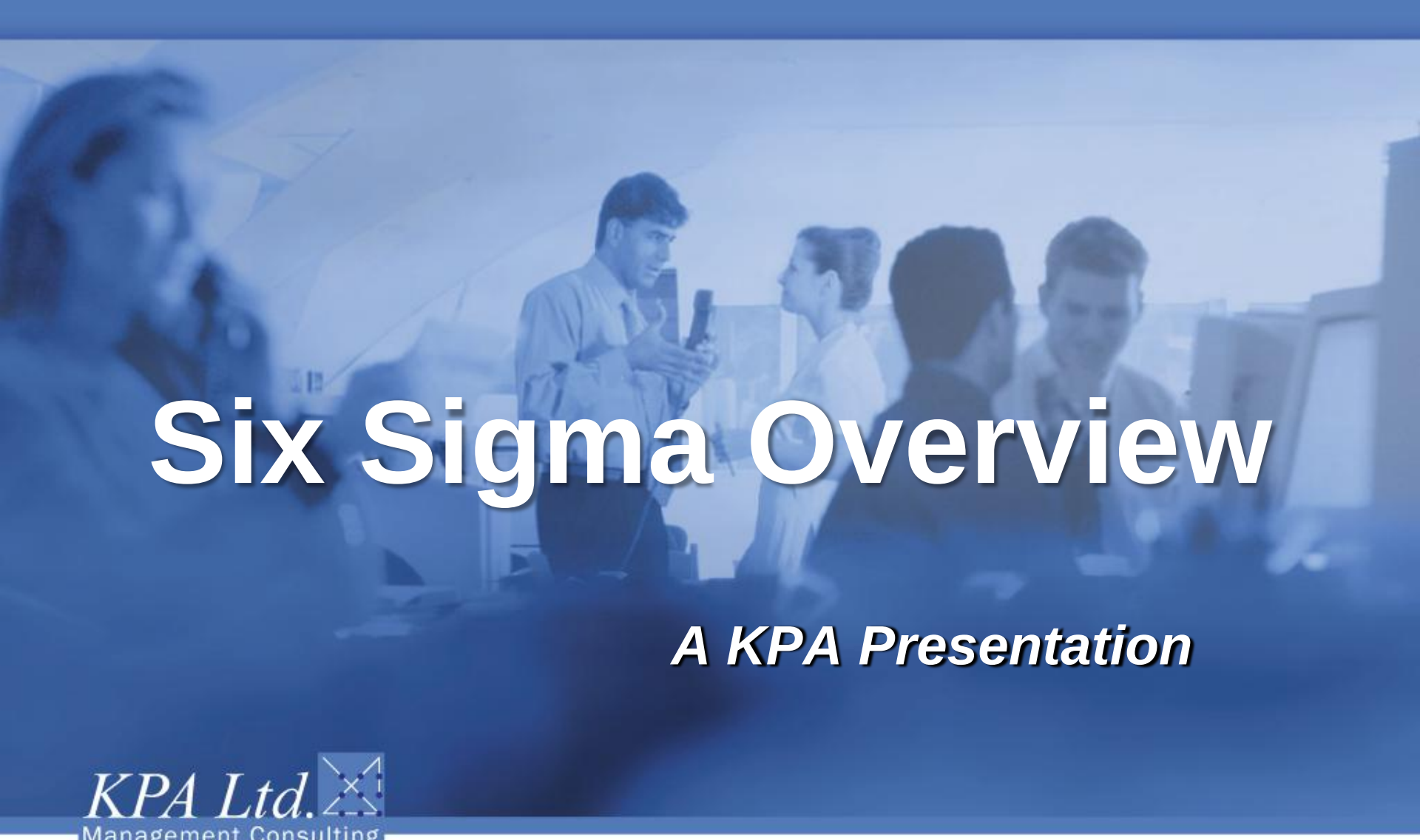


Six Sigma Overview

A KPA Presentation

KPA Ltd.
Management Consulting

www.kpa-group.com

KPA Ltd.
Management Consulting

- ***KPA*** is an international management consulting firm with offices in Israel and strategic partners in the US, Spain, Belgium, France and Central Europe. Formed in 1990 by Professor Ron Kenett as a partnership, the firm incorporated in 1994.
- The ***KPA*** staff consists of specialized consultants with expertise in strategic planning, market research, industrial statistics, quality and risk management, business development and human resource management. ***KPA*** is currently involved in the strategic planning of medium and large companies, in international market research and customer surveys, establishing quality systems and Six Sigma initiatives, organizational development, risk management and change management consulting.

KPA Ltd.
Management Consulting

The KPA Vision and Mission Statement

Our Mission

"To provide our customers with the expertise required to formulate strategies, concepts and breakthrough business processes that will turn their organizations into leaders in their field."

Our Vision

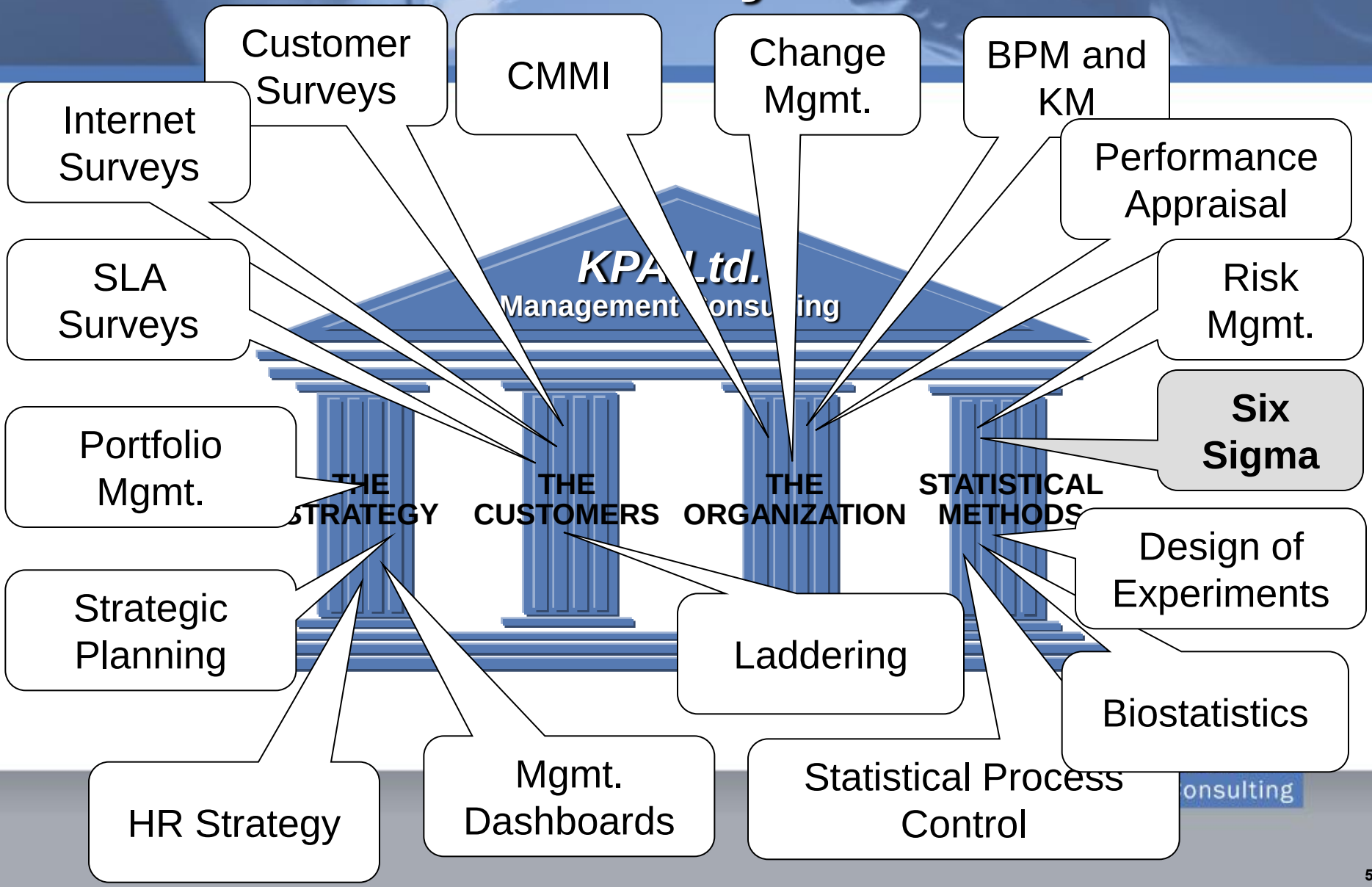
"To be known as a center of excellence in modern management methodologies and as a source of research and training in our field."

KPA Ltd.
Management Consulting

KPA areas of activity

KPA Ltd.
Management Consulting

KPA areas of activity



KPA products and services

- Strategic Planning, Change Management, Six Sigma initiatives, joint ventures and M&A facilitation
- Market Research and Voice of the Customer Surveys
- Organizational Development, Appraisal Systems and Voice of the Workforce Surveys
- Statistical Consulting, Data Mining, Risk Management, Industrial Statistics, Biostatistics
- **Six Sigma training and consulting**

KPA Ltd.
Management Consulting

KPA clients' industrial areas

- Telecommunications
- Software
- Banking
- Plastics
- Chemicals
- Pharmaceuticals
- Food & Beverage
- Electronics
- Cellular Services
- Health Care
- Education
- Energy
- Transportation









KPA Ltd.
Management Consulting

KPA partial list of clients

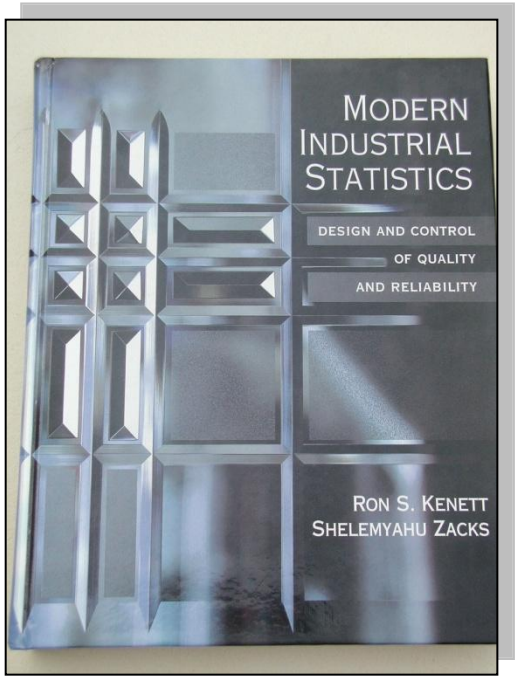
- The Israel Electricity Corporation, utility
- The Open University, education
- hp Indigo, the electronic printing division of hp
- Cellcom, a leading Israeli cellular service provider
- ECI, telecom supplier
- Perrigo, pharmaceuticals
- Eden Springs, home office delivery
- Cisco, network management software
- Amdocs, billing systems
- Dead Sea Bromine Group, chemicals
- Bank Leumi, financial services
- Rafael, eletronics

KPA Ltd.
Management Consulting

Why Six Sigma ?

Robert W. Galvin
Chairman of the Executive Committee
Motorola, Inc.

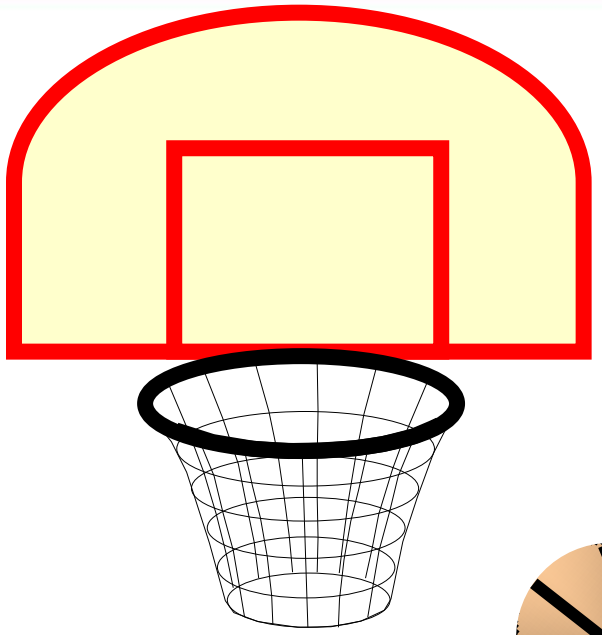
"At Motorola we use statistical methods daily throughout all of our disciplines to synthesize an abundance of data to derive concrete actions….
How has the use of statistical methods within Motorola Six Sigma initiative, across disciplines, contributed to our growth? Over the past decade we have reduced in-process defects by over 300 fold, which has resulted in a cumulative manufacturing cost savings of over 11 billion dollars"*.

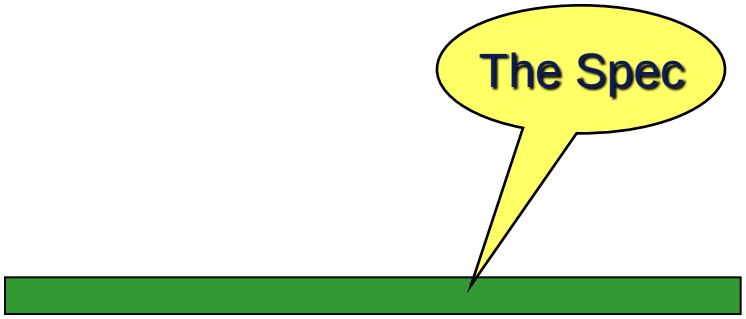


KPA Ltd.
Management Consulting

*From the forward to MODERN INDUSTRIAL STATISTICS: Design and Control of Quality and Reliability, Kenett and Zacks, Duxbury Press, 1998, Spanish edition 2000, 2nd paperback edition 2002, Chinese edition 2004.

The Basketball Analogy

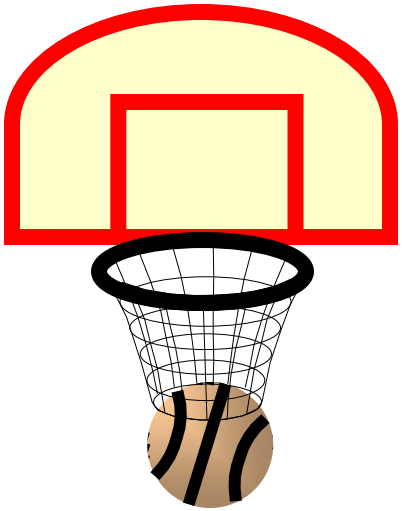


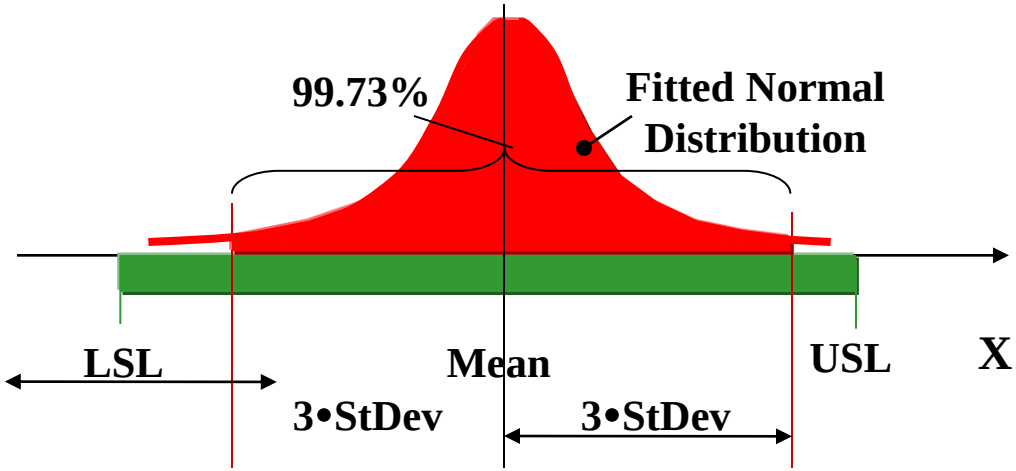


How do we Perform?

KPA Ltd.
Management Consulting

The Basketball Analogy (2)





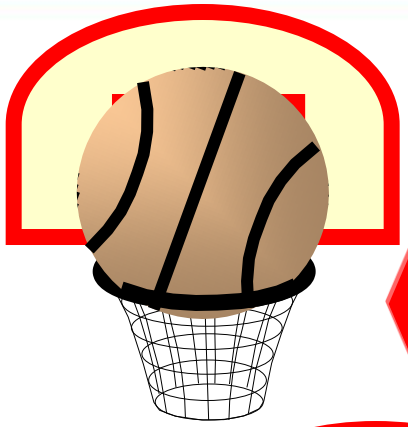
$$Cp = \frac{USL - LSL}{6 \bullet StDev}$$

$$Cpk = \frac{Min\ \{Mean - LSL,\ USL - Mean\}}{3 \bullet StDev}$$

How do we Perform?

KPA Ltd. Management Consulting

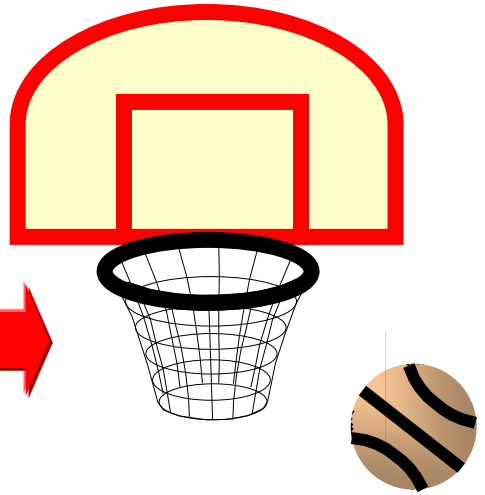
The Basketball Analogy (3)

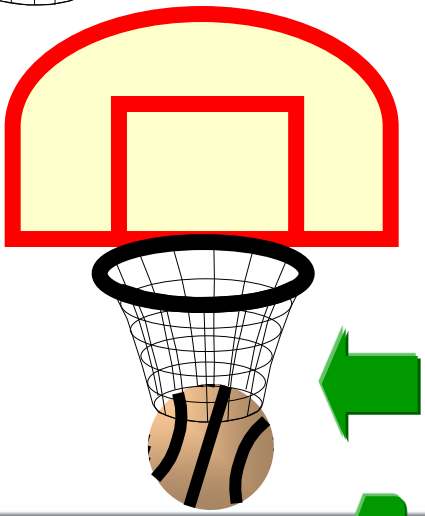


Rework

There is no Potential Capability

There is Potential Capability
However
There is no Actual Capability





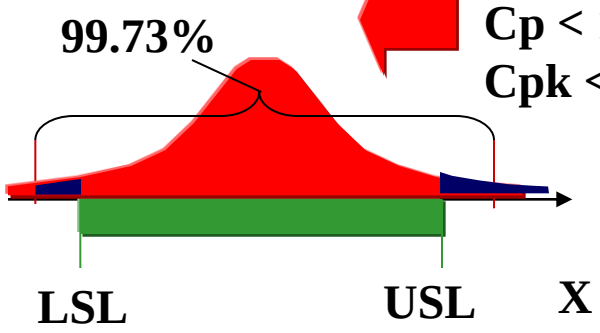
There is Actual Capability

Waste

Performance

KPA Ltd.
Management Consulting

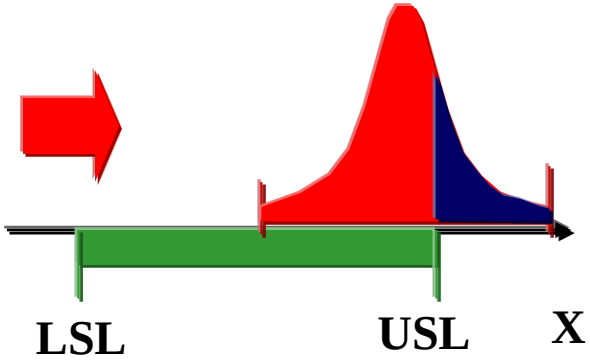
Six Sigma Indicators



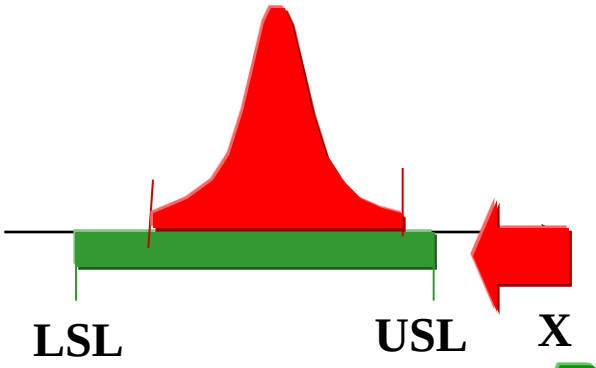
There is no
Potential Capability
Cp < 1.0
Cpk < 1.0

Rework

There is
Potential Capability
There is no
Actual Capability
Cp > 1.0
Cpk < 1.0



Waste



There is
Actual Capability
Cp > 1.0
Cpk > 1.0

Performance

KPA Ltd.
Management Consulting

Six Sigma Indicators (2)

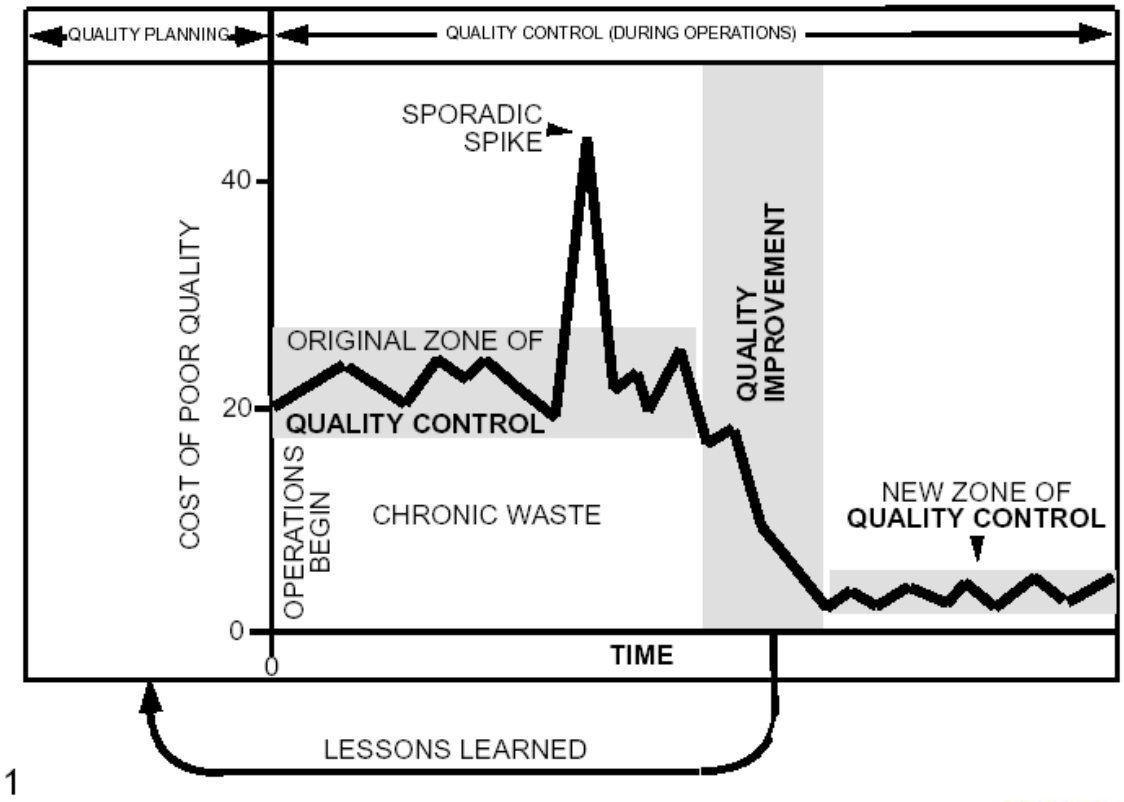
C_p, C_{pk}, Defects Per Million and Sigma Level

C_p	PPM	C_{pk}	PPM	Sigma Level
0.67	50,000	0.17	308,770	2
1.00	2,700	0.50	66,811	3
1.33	63	0.83	6,210	4
2.00	0.002	1.50	3.4	6

Where are our critical processes?

KPA Ltd.
Management Consulting

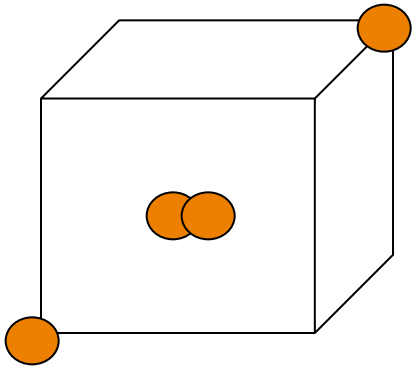
The Juran Trilogy: Planning, Improvement and Control*



KPA Ltd. Management Consulting

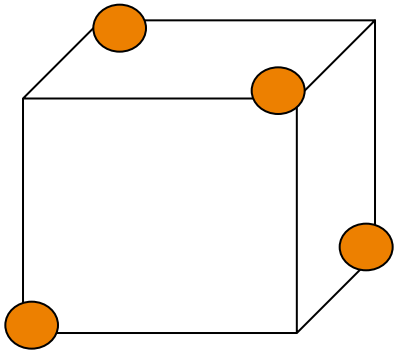
*J.M. Juran, *Juran on Leadership for Quality*, Free Press, 1989,

Design for Six Sigma



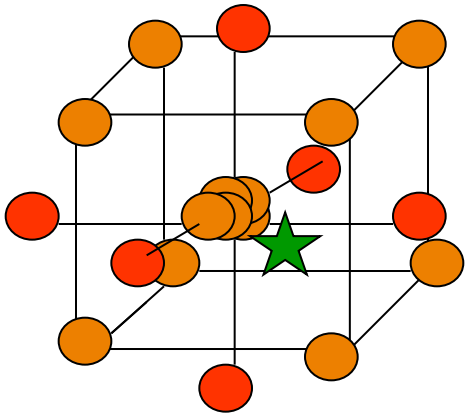
Scoping

Initial assessment



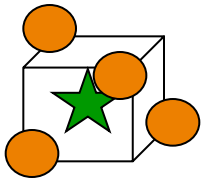
Screening

Fractional designs



Optimizing

Response surfaces



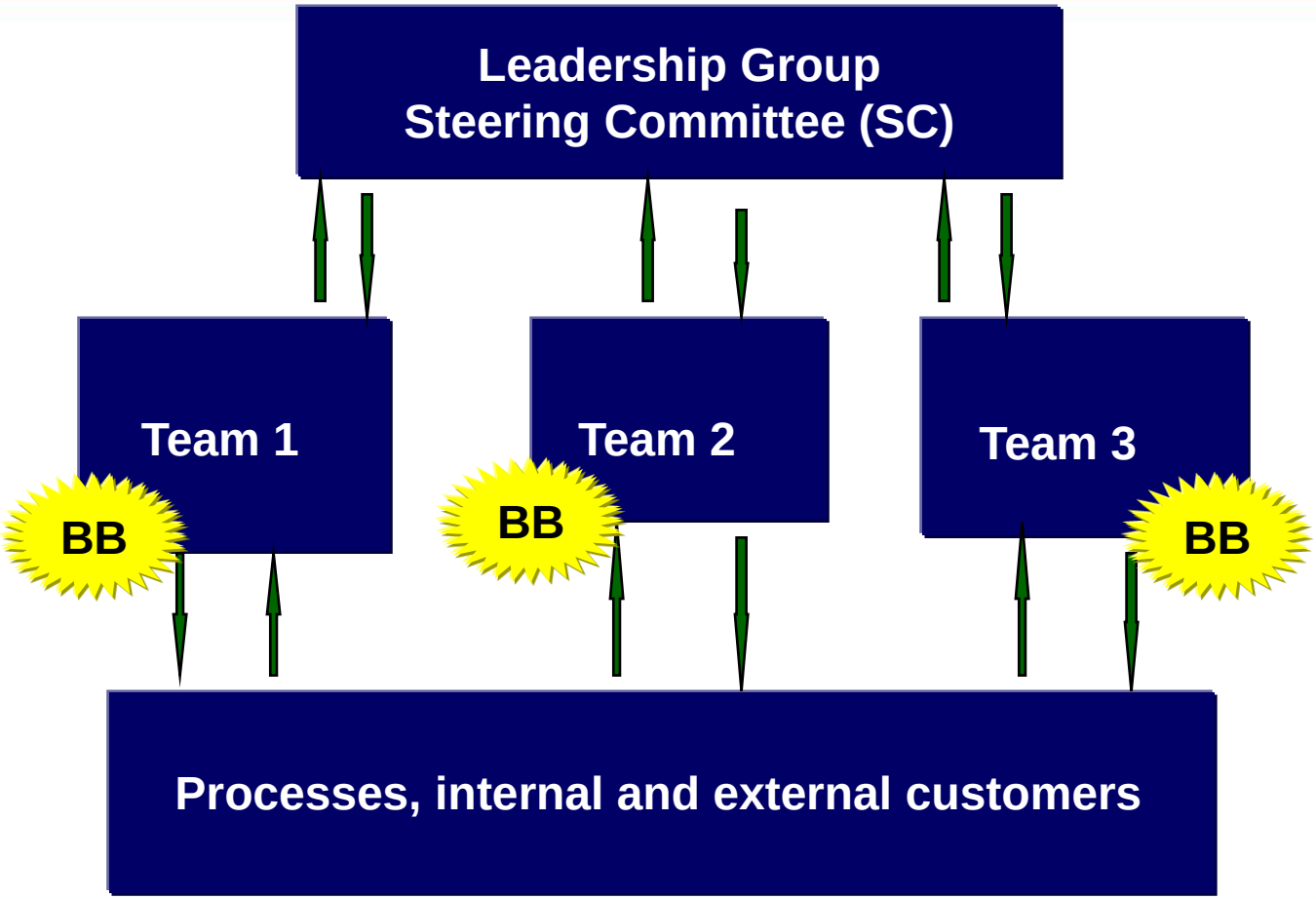
Robustness

Robust designs

Process knowledge

Process Confidence

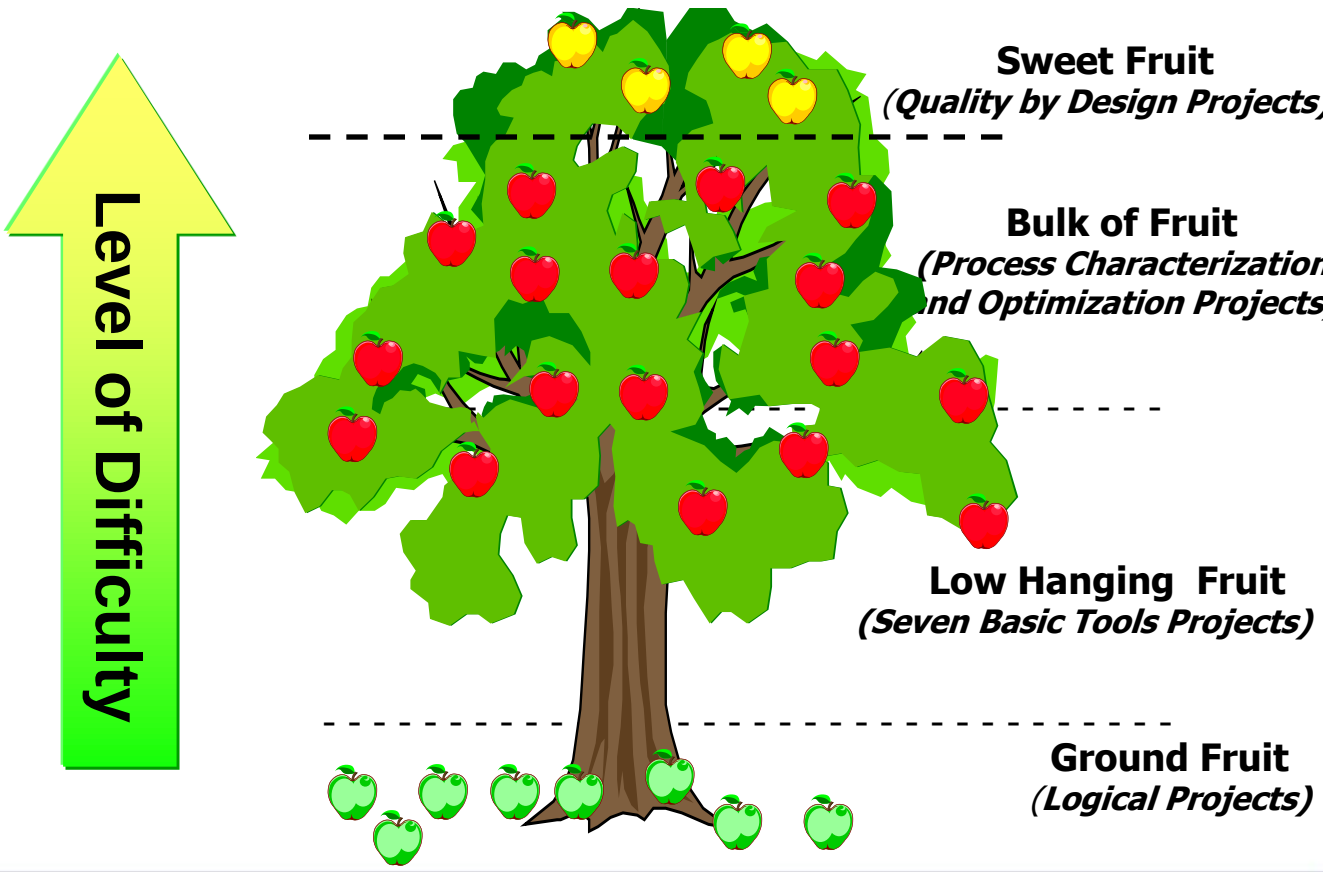
The Organizational Structure: Supporting Six Sigma implementation



Master Black Belt

KPA Ltd.
Management Consulting

Project Identification



Design for Six Sigma

DFSS

Define-Measure-Analyze
Improve-Control

DMAIC

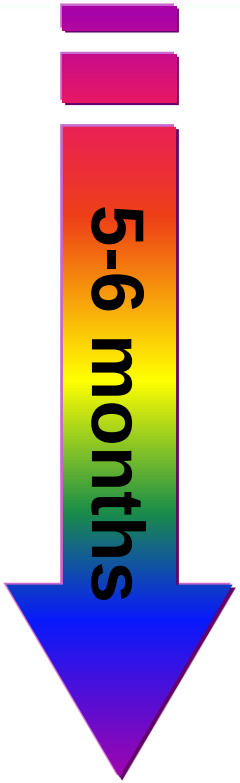
Collect-Organize-Launch
Perform-Implement

Marathon

KPA Ltd.
Management Consulting

Six Sigma Methodology

DEFINE	Formulate the Mission by SC & assign team
MEASURE	Collect Data and Analyze Symptoms & Redefine the Mission
ANALYZE	Root Cause Analysis
IMPROVE	Recommend Improvement Plan to SC, Pilot Implementation and Change Management
CONTROL	Establish a control mechanism (measurement) Analysis Full deployment and Publication of Results



KPA Ltd.
Management Consulting

DMAIC

Marathon Methodology

Collect	Announce Marathons, collect suggestions
Organize	Create database and screen suggestions for Marathons, assign Sponsors
Launch	Design Marathons
Perform	Prepare Marathon Perform Marathon
Implement	Implement Marathon decisions Assess Marathon impact

KPA Ltd.
Management Consulting

COLPI

Matrix Criteria Ranking

- List criteria to assess projects – brainstorming, eg
  - Impact on customer satisfaction
  - Required investment
  - Ability to implement etc.
- Select top 3 – voting
- Voters place their votes for each criterion
- Add up votes for each project
  - Scale by 1 (low), 2 (medium) or 3 (high)
- Select projects

KPA Ltd.
Management Consulting

Project Prioritization

Project Evaluation Matrix

H = High M = Medium L = Low

Topic	Impact			Required investment			Ability to implement			Score
	L	M	H	L	M	H	L	M	H	
High priority	0	0	8	8	0	0	0	0	8	100
Low priority	8	0	0	0	0	8	8	0	0	0
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50

Low Impact

High Impact

Low Cost

High Cost

Low Ability

High Ability

Voters = 8

Number of participants

Project Prioritization

Project Evaluation Matrix

H = High M = Medium L = Low

Topic	Impact			Required investment			Ability to implement			Score
	L	M	H	L	M	H	L	M	H	
High priority	0	0	8	8	0	0	0	0	8	100
Low priority	8	0	0	0	0	8	8	0	0	0
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50
										-50

Score = **(impactH*3+impactM*2+impactL*1+ investH*1+investM*2+investL*3+ abilityH*3+abilityM*2+abilityK*1 -(3*#voters))*100/(6#voters)**

Voters = 8

Black Belt Training

Table of Contents

KPA Ltd.
Management Consulting

Six Sigma Training

KPA Management Consulting
25 Hataasia Street
P.O. Box 2525 Raanana 43100, ISRAEL
Tel: +972 9 740 8442 Fax: +972 9 740 8443
info@kpa.co.il • www.kpa.co.il

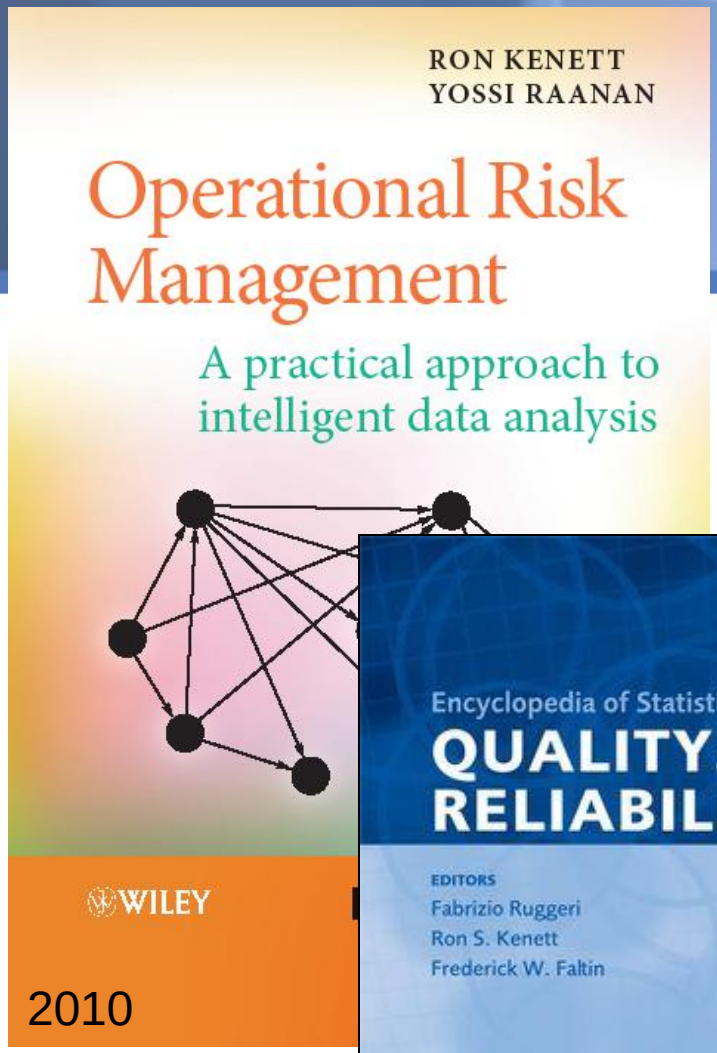
Six Sigma
Black Belt Exam

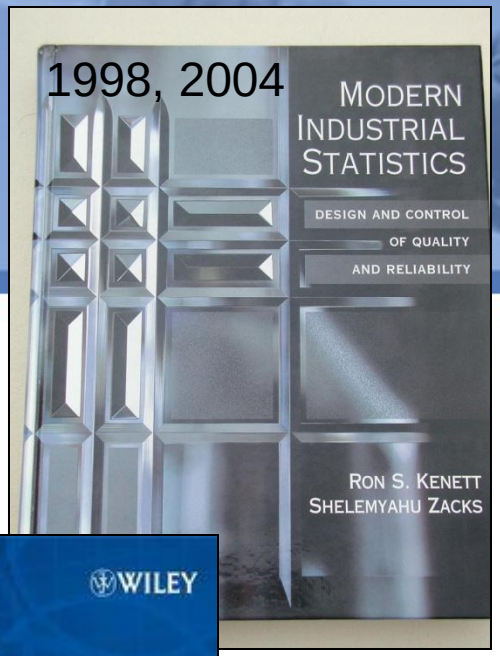
Part I

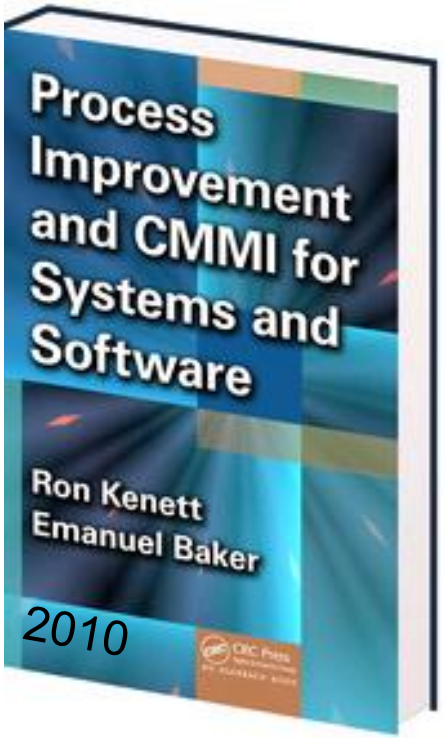
KPA Ltd.
Management Consulting

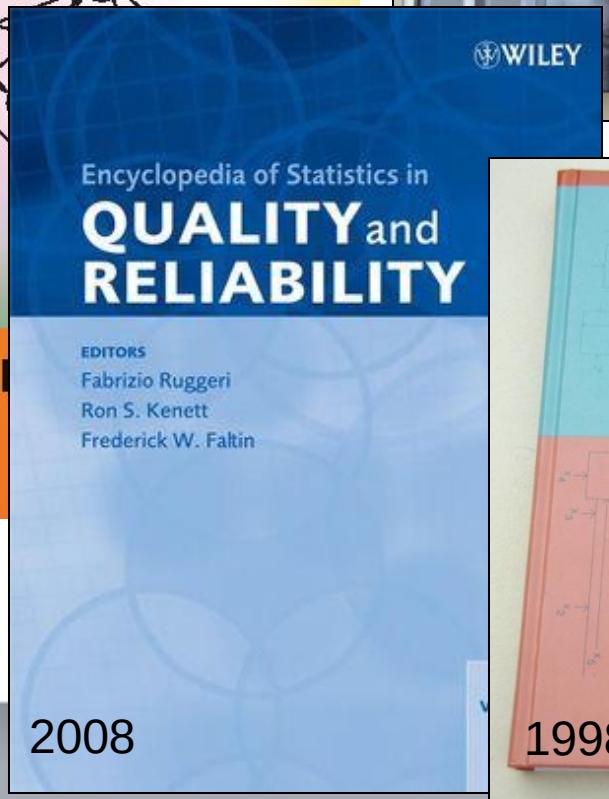
Black Belt Training

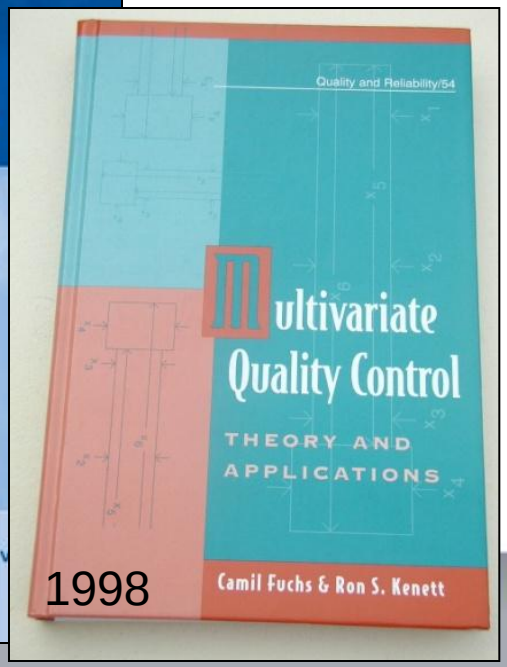
KPA Ltd.
Management Consulting











KPA Ltd.
Management Consulting

sixsigma@kpa.co.il