Real Progress Requires a Real Transformation, the Toughest Gig a Leadership Team can Undertake

> Barry Bebb, Ph.D., MBB Senior Consultant ASI Consulting Group, LLC 30200 Telegraph Road, Suite 100, Bingham Farms, MI 48025 Ph: 248 530-1395 Cell: 248 767 6695

The Challenge!

In the Abstract it is noted that "Even CEOs encounter great difficulty in leading real change within their enterprises."

What if the idea for change comes from people lower in the organization? Is it possible to start a real change initiative from the bottom?

If you believe **Yes**, raise your hand.

If you believe **No**, raise your hand.

The Challenge!

What if the idea for change comes from an unknown external person striving to promote an unknown, esoteric sounding topic like Taguchi Methods?

Is it possible to get an enterprise to seriously consider the topic?

If you believe **Yes**, raise your hand. If you believe **No**, raise your hand. The second challenge was "the Mission Impossible" given to a small group of people that called themselves the Impact Team.

Like In2:InThinking Network, the Impact Team was all about thinking differently.

What Was the Impact Team?

The Impact Team was formed as a group of volunteers at the 1992 Annual Symposium of the American Supplier Institute.

The challenge given to the Impact Team was to promote Robust Engineering (Taguchi Methods).

Full Time Team members, in alphabetical order: Barry Bebb (Xerox), Bill Bellows (Rocketdyne), Bob Burdick (Lexmark),

Tim Higgins (Rocketdyne), Larry Smith (Ford), Dawson Ward (Lexmark).

Interpretation of the Challenge?

The Impact Team concluded that promotion meant:

- 1.Implementation of Robust Engineering in manufacturing corporations.
- 2.Implementation required corporate deployment.
- 3.Corporate deployment could only be achieved by the top management team.

What is Robust Engineering?

Robust Engineering is a methodology created by Dr. Genichi Taguchi for optimizing the performance of engineered systems at the lowest possible cost.

Since the early 1950s, Robust Engineering has increasingly become a core engineering practice in Japan by companies like Toyota, Nissan, Denzo, Fuji Photo Film, Fuji Xerox, NT&T, INAX Tile, etc. to achieve superior Quality, Reliability, and Durability at reduced product cost.

Why Robust Engineering?

Robust Engineering is the most powerful, broadly applicable methodology for maximizing the performance of engineered systems under real world usage conditions.

On average, Robust Engineering helps to reduce Failure Rate (or Warranty Cost) by a factor of three *(at reduced product cost)* for products already optimized using more traditional methods such as statistical Design of Experiments and Reliability Engineering.

Caramel Candy Case Study

In 1948, Dr. Taguchi was challenged by a Caramel Candy company to reduce the variation in the hardness of caramel candy over the range of Temperatures common in downtown Tokyo.

Caramel Candy Problem



Results of Dr. Taguchi's work on Caramel Candy

How can such results be achieved?

Dr. Taguchi, together with employees of the candy company, found ingredients within Caramel Candy that could be varied without significantly changing its taste or texture.

By conducting Robust Optimization to find the Best Levels (Amounts) for selected ingredients, the candy was made 'robust' to temperature which obviously could not be controlled in downtown Tokyo. **First world changing application** of Robust Engineering was US Army contract to replace Japan's entire Telephone System after World War II.

Requirement 100% Warranty by NT&T ECL - 40 Years for Exchanger - 15 Years for Tel. sets

How do you design for or even test for forty year life?

Need

Dr. Genichi Taguchi with ECL during 1950's **Development of Cross Bar Switching System** ECL (Electrical Communication Labs.) vs. Bell Labs. US Army Contract. During six years of What is Noise? development, ECL optimized All sources of over 3000 Design Control Factors variation. for "Robustness" by studying Environment interactions between Wear/Aging Control & Noise Factors. Manufacturing

14

Dr. Genichi Taguchi with ECL during 1950's ECL Wins

NT&T Electrical Communication Labs won the US Army contract over the vaunted AT&T Bell Labs using a very embryonic form of Robust Engineering.

	Budget	# People	# Years	Result
AT&T Bell Labs	50	5	7	Not finished
NT&T ECL	1	1	6	Superior

Robust Engineering in U.S.

In 1982, the Ford Supplier Institute introduced Dr. Genichi Taguchi to Ford, AT&T, and Xerox.

Frustratingly, today, 26 years after its introduction in the US (~60 years after introduction in Japan), Robust Engineering is still not broadly practiced in the Western World to the detriment of our global competitiveness.

Robust Engineering in U.S.

This frustration motivated the creation of the Impact Team by the American Supplier Institute (the new name for the Ford Supplier Institute).

Robust Engineering in U.S.

The fate of the 'Big Three' automotive corporations could have been very different

Is Robust Engineering the Difference?

Toyotas and Hondas age more gracefully

Using results from the 2001-2005 surveys, we analyzed how vehicles from six major automakers typically fare as they age. We combined problem rates of one- to eight-year-old cars from each survey year. On average, Toyota and Honda vehicles have far fewer problems than their competitors as they get older. Ford vehicles are closest to the average.

Volkswagen

GM & Chrysler Ford

Honda Toyota

Consumer Reports, April 2006 issue

Is Robust Engineering the Difference?

Toyota's Robust reliability

~2 times better than Ford

~3 times better than GM & Chrysler

Consumer Reports

Ford began the Deployment of the Robust Engineering Process (REP) during the 1980s under the leadership of Larry Smith. The momentum of this initiative was lost during the 1990s.

Perhaps even this incomplete Deployment of Robust Engineering explains the higher reliability of Ford vehicles.

What About Deployment of Business Processes?

The Deployment of contemporary Business Processes in the US has not faired much better. Examples include:

- Balanced Scorecard
- Policy Deployment
- Peter Drucker's extensive work
- Tom Peters' extensive work
- Subir Chowdhury's extensive work
- Peter Senge's Fifth Discipline
- Many others

Keith Hammond Quote

- "Machiavelli had it right. Change is a tough gig.
- Change lies at the heart of what we expect our leaders to produce.
- But the creation of new values, of different ways of thinking and acting, is the most difficult task that any leader can undertake."

Dilbert's Message to Bosses

Turn employees loose!

Back to deployment of Technical Stuff

The daunting challenge of reaching Top Management led to the creation of what we called the Cloud Chart.

Cloud Chart

Impact Team Ideas

Cloud Chart

The Impact Team Process

Create Ideas to gain buy-in of Robust Engineering by contacts in target corporations.

Try the Ideas out in our own organizations.

Use the knowledge gained to help our lower level contacts in other organizations climb their organizational hierarchy.
Other Possible Approaches

- 1. Go straight to CEO Approach of
 - Michael Harry, CEO, Six Sigma Academy
 - Subir Chowdhury, CEO, ASI CG
 - The rare internal advocate with CEO's ear
- 2. Climb Hierarchy level by level
- 3. Establish **Community of Practice** initially at working level climbing upward level by level, establishing a **Community of Practice** at each level.

Communities of Practice (CoP)

Communities of Practice: Learning, Meaning, and Identity - Learning in Doing: Social, Cognitive and Social Perspectives, Etienne Wenger, Cambridge University Press, 1999, 318 pgs

1.6 million 'Communities of Practice' hits on Google

Communities of Practice (CoP)

A **Communities of Practice** can be initiated by anybody that wants to take the lead.

- Find and study external Case Studies.
- Develop internal examples.

Establish **Communities of Practice** to develop internal expertise.

This type of process establishes credibility that can be leveraged to cause Top Management to buy in and undertake of full deployment.

Crises Management The New Norm?

Henry Ford observed

"A business that makes only money is a poor business."

Corollary

A business that makes products and services that add value and make money is a good business.

Financial crises tends to focus management on manipulating money in futile attempt to solve immediate problems rather than adding value.

Management, crises or normal,

is all about people.

Crises Management should not focus on managing Money.

It should focus on managing **Bankers**.

Financial crises does indeed demand urgent fire fighting. But! It also demands a simultaneous, real transformation of how the business adds value. "Plan for long term success concurrently with fire fighting."

Top Management all too often makes decisions and tells their direct reports to implement their decisions – especially during crises.

"You cannot tell anybody anything <u>important</u>, you can only lead a person to self discovery."

Crises Management The bosses' job should <u>not</u> be to make decisions! "The bosses job should be to cause decisions to be made by those most knowledgeable about the topic and responsible for its implementation."

Crises Management This is HUGE!

Upper management should involve people at all levels in identifying problems and opportunities for improvement.

"Involvement fosters good ideas and strong commitment."

Why is involving people at all levels **HUGE?**

Because upper Management simply does not know enough about what goes on in the trenches to make good decisions for people in the trenches.

And they too often think they do!

Case Studies

Xerox – Late 1970s, early 1980s
 Caterpillar – 2000-2006.

Others

Key Success Factors

Xerox Case Study

- Late 1970s, 42 Japanese competitors entered low end of U.S. copier market.
- IBM entered mid-range and Kodak entered high-end of market.
- Xerox profits declined from \$1B/yr at the rate of \$0.25B/Qtr.

Kearns' Actions

David Kearns, Xerox CEO, did not panic.

He took the time to make the company the **best** in the World and retake the business from Japan, Inc., IBM, and Kodak.

In order to understand what was required to be the best, he took actions to create **Competitive Benchmarking Methods for Business Processes** as well as Product and Service outcomes.

Xerox Took 3 Immediate Actions

- 1. Stabilized financials by selling some recently acquired small businesses.
- 2. Spent one year Benchmarking business processes in Fuji Xerox and non-competitive Japanese corporations.
- 3. Collocated 30 Xerox people (all levels, all disciplines) from around the world to create new business processes in 6 months including engineering and manufacturing processes.

Xerox Case Study Actions

Rolled out new business processes called Leadership Through Quality in late 1981 using a Deployment Process that will be discussed later.

All 100,000 employees went through three 40 hour weeks of training and completed at least one Project using the new **Leadership Through Quality** business processes.

Xerox Case Study Results

Rolled out 50 Series in 1987 replacing all products in all three market segments.

Regained market share and grew revenues and profits to record levels.

Caused both IBM and Kodak to abandon the reprographic business.

Won Malcolm Baldrige National Quality Award in 1989 (and 1997 and 2008).

Caterpillar Case Study

- In 2000, stuck at \$20B revenue for 20 years due in part to Japanese competition.
- Set goal of \$40B revenue by 2006.
- Rolled out Lean Six Sigma and Design for Six Sigma encompassing Taguchi's Robust Engineering in 2000.
- Achieved \$60B revenue in 2006.

Others

- Hundreds of successes and thousands of failures in truly transforming a company.
- Successes highlight CEO Passion, Commitment and Involvement.
- Failures are due to taking shortcuts in Deployment Process.

Critical Success Factors

- CEO must personally lead new initiative with high intensity and visibility.
- Dave Kearns and Glen Barton (CEO of Caterpillar) devoted significant time over several years leading the transformation process.
- Both were visibly the first to be trained in the new processes for 10 to15 days spread over about 2 months.

Critical Success Factors

- Both personally promoted the new processes with high visibility and accessibility in all locations around the world.
- Both gave talks explaining the business processes in auditoriums, town hall meetings, cafeterias, hallways, etc.

A Xerox Story

- About one year after the initial roll out of Leadership Through Quality, a highly respected engineering manager opined that "Leadership Through Quality was not the way, it was in the way."
- David responded, "Leadership through Quality is not in the way, it is the way that we will run the business for the foreseeable future. If you cannot sign up, you should consider seeking employment elsewhere."

DEPLOYMENT PROCESS

Real Transformation: The Toughest of all 'Change' Tasks

Deployment Initiatives Must Succeed

- Failed deployment effort will shut out the enterprise from that option for many years
 "We tried that before and it didn't work"
- Partial implementations leave competing systems in place

The New





The Old



10 new Adversaries emerge for every new Advocate

Impact Team Ideas

Transformation Time Lines



Leading and Lagging Indicators

First 100 Days

- I. Create High Performance Infrastructure
- II. Plan Policy Deployment Process

I. Create High Performance Infrastructure

- 1. Characterize desired Future State and set Financial & other Targets.
- 2. Establish Hierarchy of full time Champions & Sponsors
- 3. Intensely Communicate to everyone
 - 4. Flow Down whats, whys from the Top
- → 5. Provide training in **hows** by Experts
 - 6. Identify, select and execute Projects
 - 7. Track and consolidate Financial Benefits

These are critical success factors.

Deployment Hierarchy



Impact Team Ideas

II. Plan Policy Deployment Process

- 1. Characterize the desired future state at a stated time
- 2. Set the desired results targets
- 3. Set the desired process targets (Progress Metrics)
- 4. Create and execute implementation plans
- 5. Periodically measure progress results and processes
- 6. Formulate transition plans for developing internal self-sufficiency and reduction/exit of outside consulting

The Process Steps are integrated by means of the Transformation Matrix.

H. Barry Bebb, Ph.D., *Invited Presentation to the National Academy of Engineering,* recorded, edited and published by P. B. Phelps, "Responding to the Competitive Challenge, the Technological Dimension," *The Bridge*, Vol. 18, No. 1, Spring 1988, pp. 4-6.

1. Characterize the Desired Future State at a Stated Time

By the year (Start plus 4 years)

Win in the Market Place by being the best at creating satisfied customers

- a. Growing Market Share at X% per year.
- b. Revenue at Y Billion dollars
- c. All delivered products and services Best in Class in Cost, Quality. Reliability, and Durability

Business Practices, Systems, Methods, and Tools are competently utilized by both Employees and Strategic Suppliers as a standard practice to deliver the World's best Products and Services.

2. Set the desired Results Targets

Annualized Result Targets (Year ???? and beyond)

Improve product customer satisfaction at a rate of 20% per year decrease in dissatisfaction

Improve product Cost, Quality, Reliability, and Durability at a rate of 25% per year

Decrease unit manufacturing cost at a rate of 10% per year.

Reduce warranty cost by 25% per year

Cut product delivery schedules in half by year ????

Exemplary Results Targets.

Recognize Leverage in Setting Results Targets



Reference: Mikel J. Harry, Ph.D., and Richard Schroeder, *Six Sigma – The Breakthrough Management Strategy Revolutionizing the World's Top Corporations*, Currency, New York, 2000, p 153.
3. Set Desired Process Targets

Management Commitment/Involvement - Management Percent of managers/practitioners trained - Training Application as standard practice – Application Tools always fully utilized – Customer Deliverables Impact on Product Cost & QRDs – Cost & QRD Results

Set Targets for each Phase of Deployment

- **1. Start UP –** 4th Qtr 2009
- 2. Initial Deployment 4th Qtr 2010
- **3. Accelerated Deployment –** 4th Qtr 2011
- 4. Results & Continuous Improvement 4th Qtr 2012

Transformation Matrix

Stages	yr 1	<mark>yr 2</mark> Initial	yr 3 Ongoing	yr 4+ Results
Factors	Start up	Deployment	Deployment	Cont. Imp've
Mgt	Targets being set Limited learning and participation	Increasing confidence & commitment	All managers championing Initiative	Irreversible even with Top mgt. changes
Training	Limited roll-out led by outside consultants	Planned Training roll- out underway	Most Project Leaders trained & leading Projects	Advanced training & Train the Trainer near completion
Application	A few Projects led by early adopters	Projects growing in numbers & impact.	Common and expected practice. Many Projects	Standard Practice by internal people. Consultants exiting
Customer Deliverables	Not benefitting from new methodologies	Some early success with a few Strategic Customers.	Many Customer deliveries utilized new methods.	All Customer deliveries utilized new methods.
Cost & QRD Results	Well behind the best.	Cost & QRD results improving	Cost & QRD results nearing Benchmarks	Cost & QRDs best in class

4. Create and Execute Implementation Plans

Cascade/Skill Training Process



Manager, Leader

Flow Down the Whats, Whys Purpose, Benefits, Expectations

Master Black Belts

Train in the Hows Details for applying Methods and Tools



Direct Reports



5. Periodically measure progress results and processes

Utilize normal internal processes to periodically (say Quarterly) measure Financial, Business, and Technical progress.

Executive reviews are important elements of communicating, measuring and fostering progress.

Don't kill the messenger. Drive out fear. Create a supportive environment that makes Executive reviews a rewarding experience.

6. Formulate transition plans for reduction/exit of outside consulting

While there is plenty of time for this task, it is beneficial to examine the elements of a Transition/Exit-plan early to document the spirit and intentions of the Deployment Process.

The spirit of the Transition/Exit Plan is developing Internal Self-sufficiency through:

- Advanced Technical Training
- Train-the-Trainer
- Co-training with Expert
- Co-coaching with Expert
- ✤ Etc.

The transition from ordinary to extraordinary demands consistent utilization of the world's best business, engineering, development, and manufacturing methods and processes.

Taguchi's Robust Engineering, Design for Six Sigma, and Six Sigma collective provide the capability to achieve superior Cost, Quality, Reliability, and Durability at the lowest possible total cost!

Benefits of Aggressive Approach

Accelerates improvements in bottom line performance

Saves money, reduces risk

- Top Leader participation demonstrates commitment
- Teaching is 'Best Teacher'
- Strengthens vertical communications
- Builds common understanding and language from top to bottom
- Improves effectiveness of Project Reviews
- Improves Commitment and Performance of everyone

Carries Strategic Intent into Daily Activities



Complementary Reading

James C. Abegglen & George Stalk, Jr., KAISHA, The Japanese Corporation: How Marketing, Money, and Manpower Strategy, Not Management Style, Make Japanese Corporations Pace Setters, Basic Books, Inc., New York, 1985

- Marcus Buckingham & Curt Coffman, *FIRST, Break All the Rules: What The World's Greatest Managers Do Differently*, Simon & Schuster, 1999
- Subir Chowdhury, *Next Generation Business Handbook*, John Wiley & Sons, 2004; *Design for Six Sigma, The Revolutionary Process for Achieving Extraordinary Profits*, Dearborn, 2002, *Management 21 C*, Prentice Hall, 2000; plus a dozen other excellent books.
- Jim Collins, Good to Great, Why Some Companies Make the Leap . . . and Others Don't, Harper Business, 2001
- Peter Drucker, *Managing in the Next Society*, Truman Talley Books, 2002

Complementary Reading (Cont'd)

Andrea Gabor, The Man Who Discovered Quality (How W. Edwards Deming Brought the Quality Revolution to America – The Stories of Ford, Xerox, and GM), Penguin Books, 1990

- Mikel Harry & Richard Schroder, *Six Sigma, The Breakthrough Management Strategy Revolutionizing the World's Top Corporations,* Doubleday, 2000
- Robert S. Kaplan & David P. Norton, The Balanced Scorecard: Translating Strategy Into Action, Harvard Business School Press,1996
- Peter Senge, The Fifth Discipline, Doubleday, 1990
- Douglas K. Smith and Robert C. Alexander, *Fumbling the Future: How Xerox Invented, then Ignored The First Personal Computer*, William Morrow and Company, Inc. ,1988
- Genichi Taguchi, Subir Chowdhury, Yuin Wu, *Taguchi's Quality* Engineering Handbook, Wiley, 2005

Complementary Reading (Cont'd)

Genichi Taguchi, Taguchi on Robust Technology Development: Bringing Quality Engineering Upstream, ASME Press, 1993
Kenzo Ueno, Company-Wide Implementation of Robust -Technology Development (at Nissan Motor Corp.), ASME Press, 1997