DuPont's Six Sigma Deployment -- Experiences and Recommended Practices

Steven P. Bailey, PhD, CMBB

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DuPont's Six Sigma Deployment -- Experiences and Recommended Practices from a Fortune 100 Company

Steven P. Bailey

DuPont Engineering Research and Technology

December 4, 2007

Improving DuPont Businesses Through Quality

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Detailed Outline of Talk

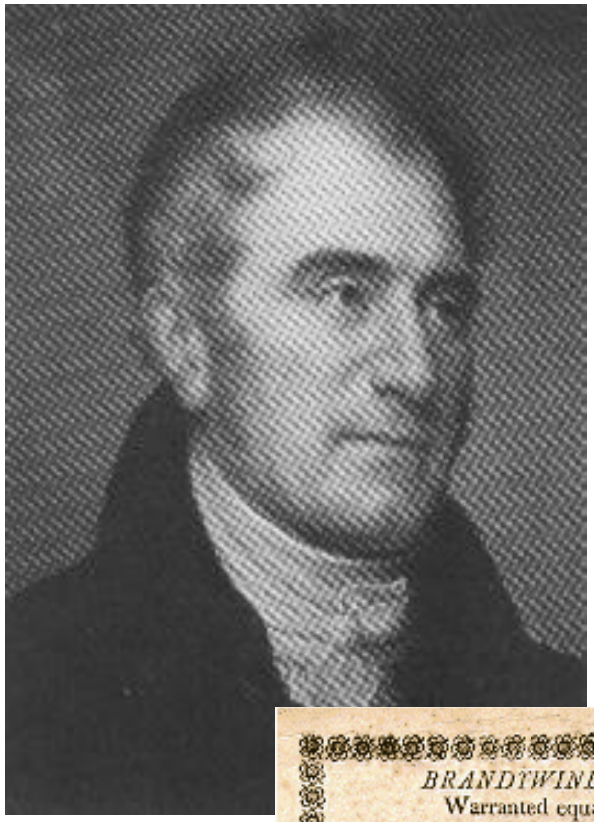
- **A brief overview of the DuPont Company (in existence since 1802!) and it's Six Sigma deployment journey (since 1999) will be presented.**
- **A Network of DuPont Champions and Master Black Belts shared experiences and identified or developed practices for successful implementation and business results.**
- **In particular, six practices associated with the Performance Management of Black Belts and Green Belts will be discussed.**
- **The evolution of DuPont's infrastructure practices relating to Information Technology and Reporting Tools, Financial Validation Standards, People Processes and Corporate Governance will also be reviewed.**

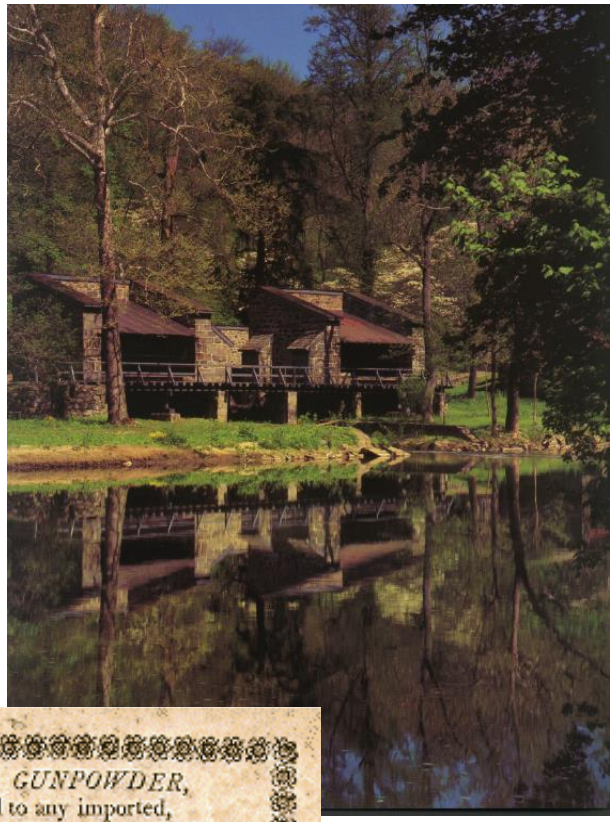
Outline of Talk

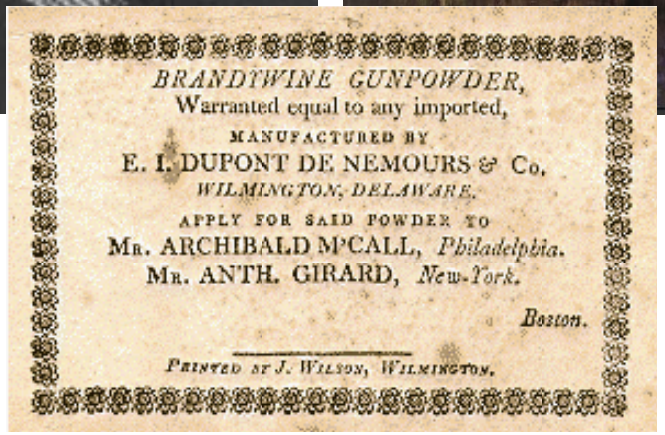
1. Overview of DuPont (1802-2015)
2. DuPont's Six Sigma Deployment (1999-2015)
3. Performance Management Practices
4. Infrastructure Practices
5. Wrap-Up and Looking Ahead (2016 and beyond)

DuPont's Beginnings….1802

E. I. du Pont





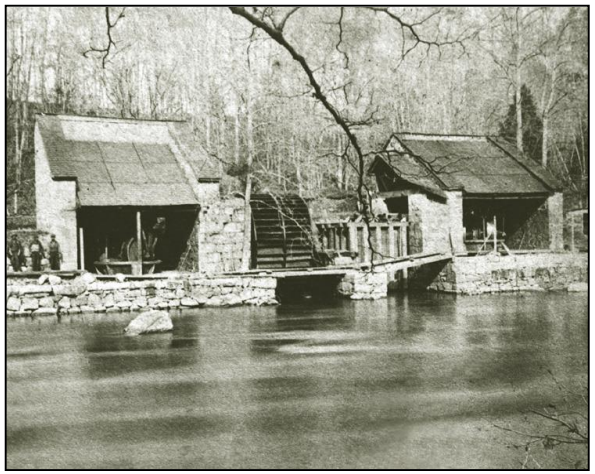


Eleuthère Irénée du Pont founded E.I. du Pont de Nemours & Company in 1802.

Structured as a family partnership, du Pont, with $36,000 raised from investors, built powder mills on 96 acres alongside the Brandywine in Wilmington, Delaware.

First-year sales were $15,116.

DuPont in 1802



100 employees

1 site

1 country

1 product

12 customers

DuPont in 2007

60,000 employees

210 sites

70 countries

~ 500,000 SKU's

> 400,000 customers

$36 billion investment

$27.4 billion revenue (2006)

DuPont's 13 Businesses as of 2012

- Pioneer Hi-Bred
- Crop Protection
- Nutrition & Health

- Protection Technologies
- Building Innovations
- Safety Resources

- Electronics & Communications

- Industrial BioSciences

DuPont's 13 Businesses

- Performance Polymers
- Packaging & Industrial Polymers

- Titanium Technologies
- Chemicals & Fluoroproducts

- Performance Coatings

DuPont's 8 Businesses as of 2015

- Pioneer Hi-Bred
- Crop Protection
- Nutrition & Health

- Protection Technologies
- Building Innovations

→ Combined: Protection Solutions

- Safety Resources

- Electronics & Communications

- Industrial BioSciences

- Performance Polymers
- Packaging & Industrial Polymers

→ Combined: Performance Materials

- Titanium Technologies
- Chemicals & Fluoroproducts

→ Both spun off: Chemours

- Performance Coating

→ Sold: Axalta (part of Carlysle)

The Beginning of Six Sigma in DuPont

Deployment began in February 1999 with a decision by DuPont CEO Chad Holliday

"There is one way to execute growth strategies (do things the right way):

Six Sigma"

Chad Holliday

TO DO LIST

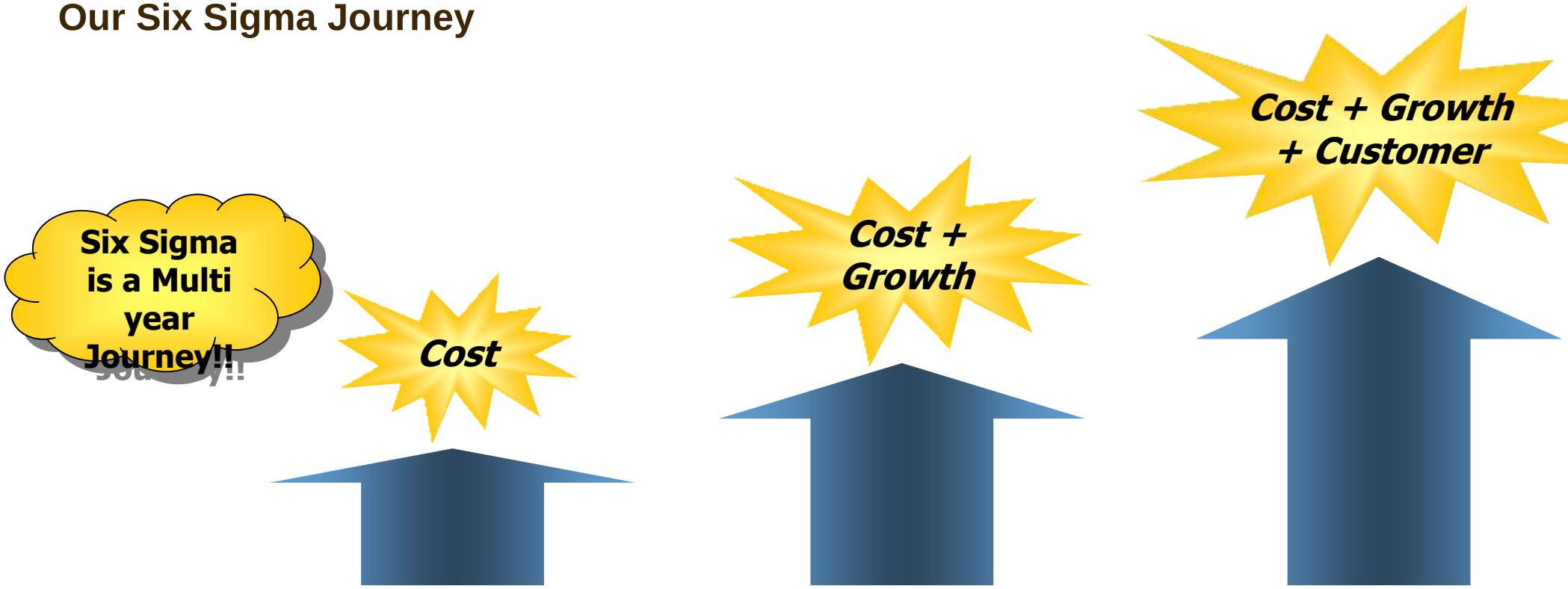
ACHIEVE SUSTAINABLE GROWTH AND INCREASE SHAREHOLDER VALUE THROUGH

A) INTEGRATED SCIENCE (MODERN BIOLOGY + WORLD-CLASS CHEMISTRY)

B) KNOWLEDGE-INTENSIVE PRODUCTS AND BUSINESSES

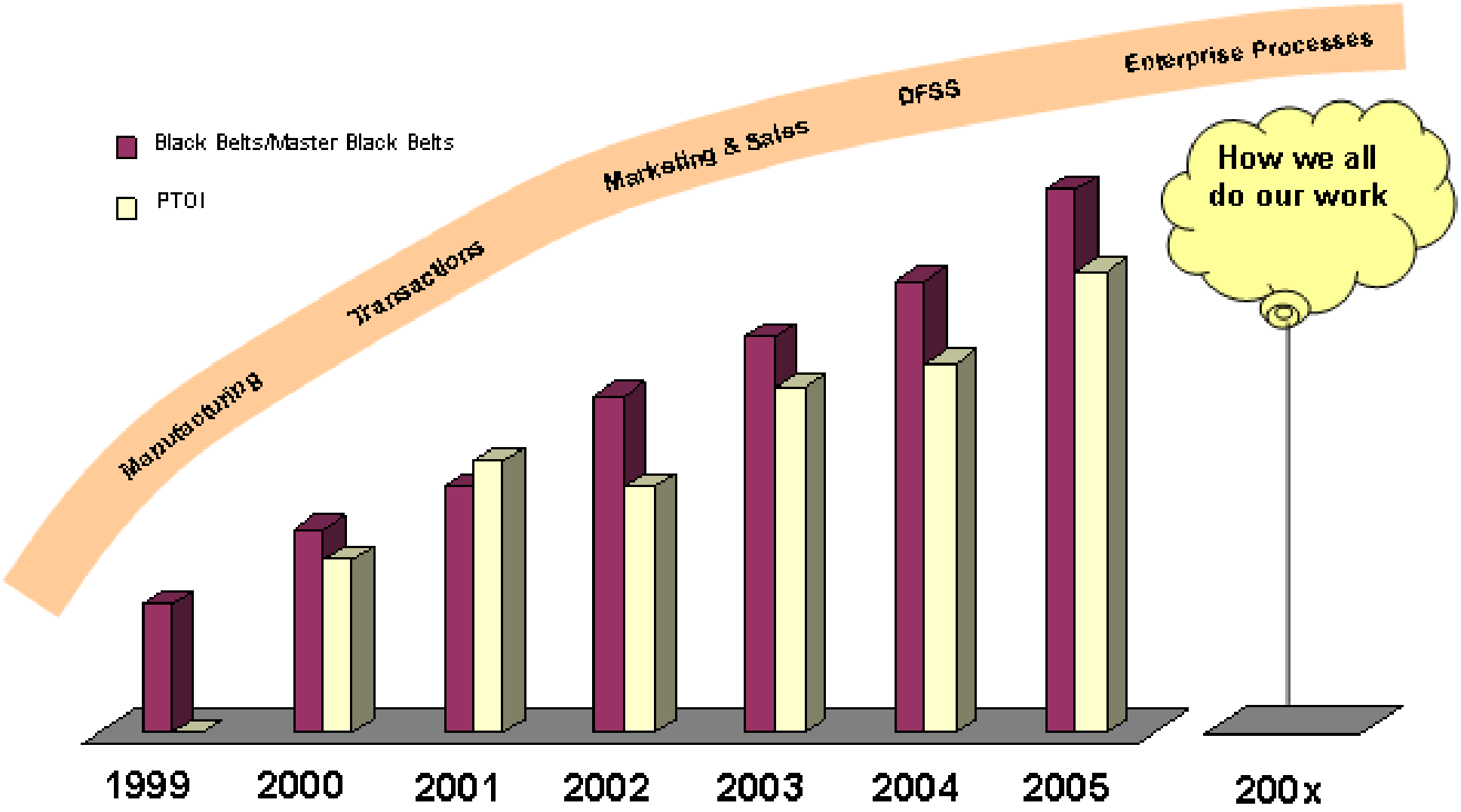
C) PRODUCTIVITY GAINS USING SIX SIGMA

Our Six Sigma Journey



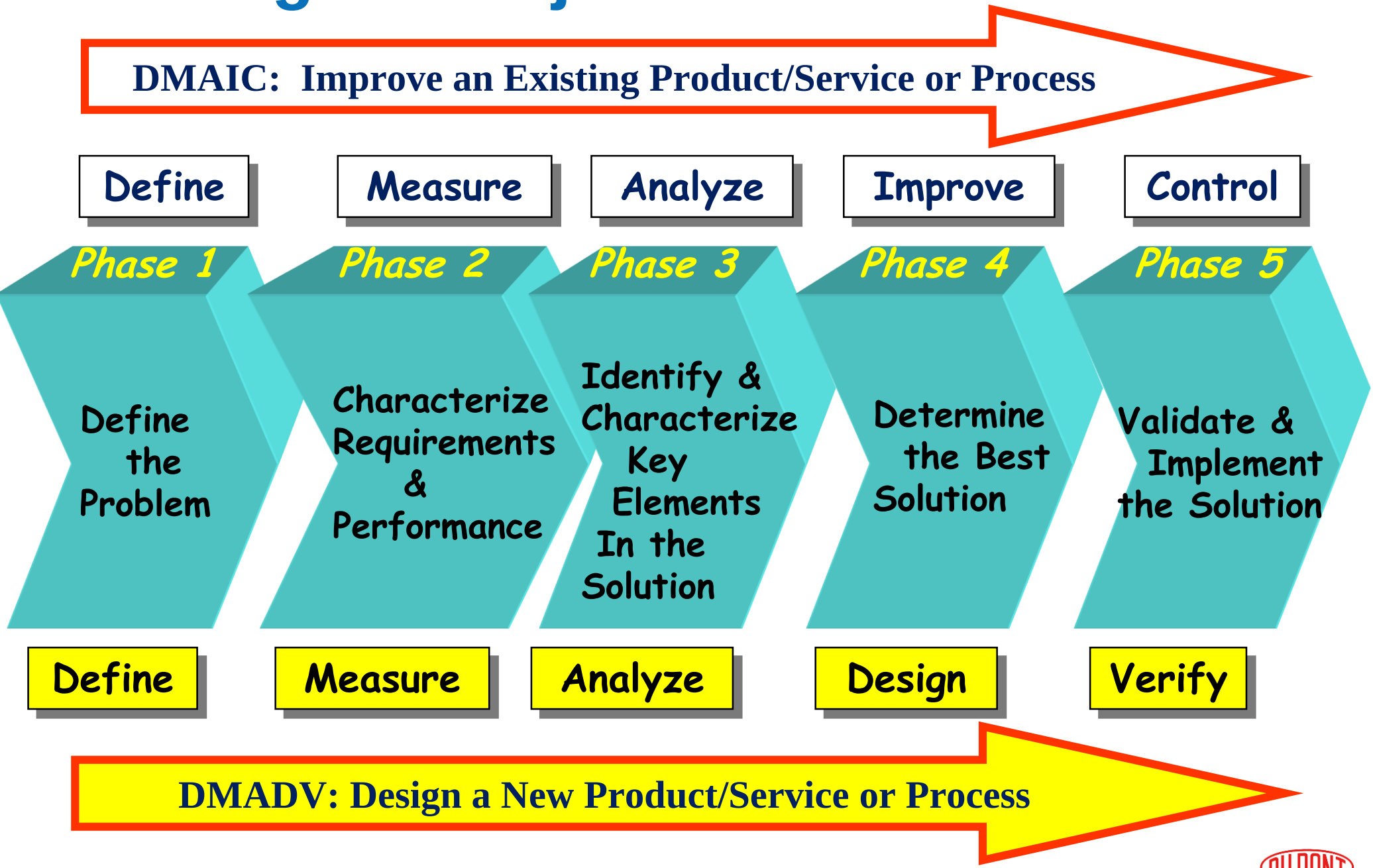
	1st three years	2nd three years	3rd three years
Era	"Focus & Win"	"The Way We Work"	"t the Customer, For the Customer"
Important	Project Selection	Integration w/Work	Customer Projects
Organization	Driven by Specialists	Driven by Leaders	Driven by All People
Metric	Benefits	Benefits + Engagement	Share + Reputation

DuPont's Six Sigma Journey

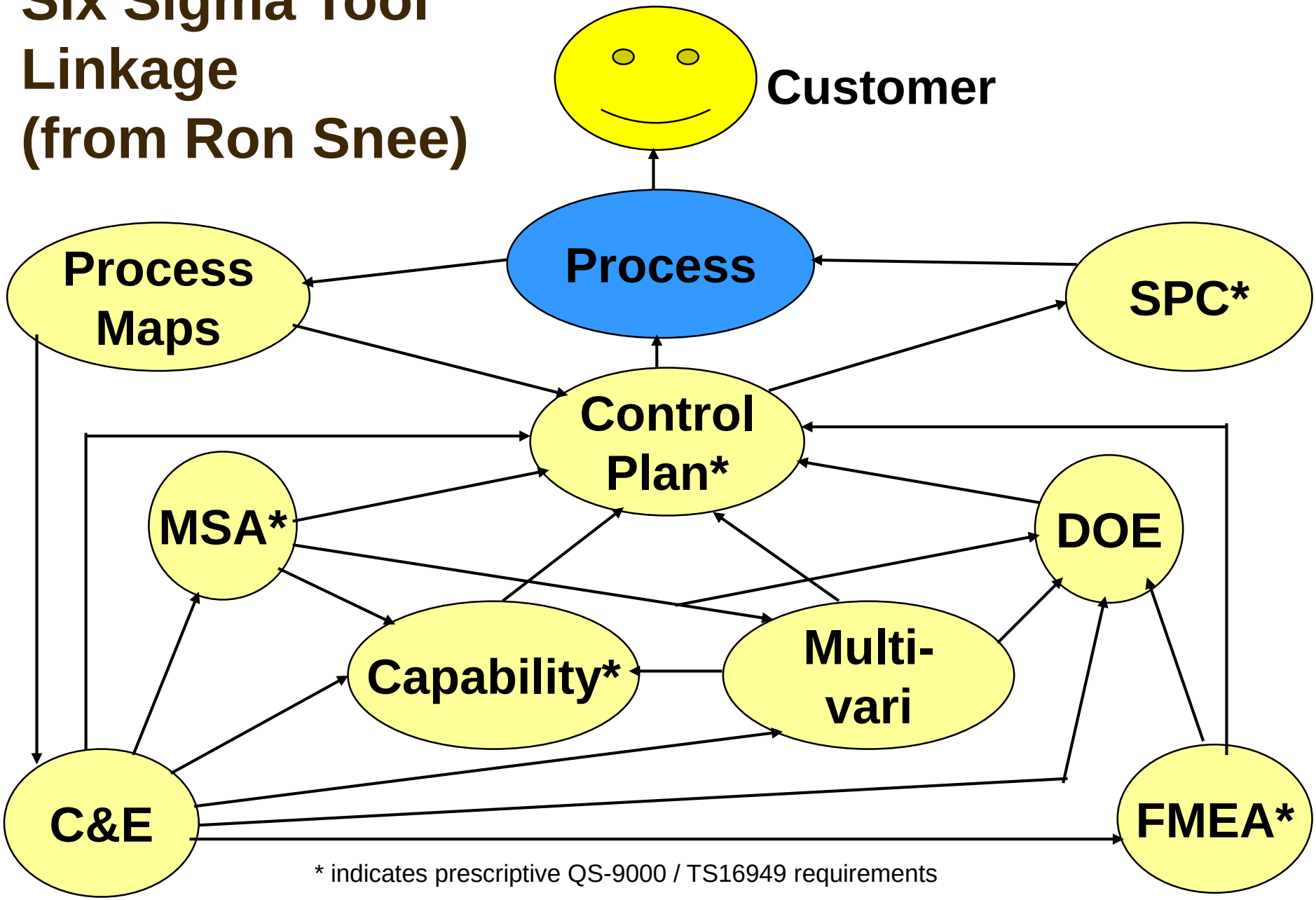


Leadership GB "graduation day" in Nov 2000
Left to Right: COO Richard Goodmanson
MBBs Dave Flattery and Steve Bailey
CEO Chad Holliday

Six Sigma Projects: Two Frameworks



Six Sigma Tool Linkage (from Ron Snee)



* indicates prescriptive QS-9000 / TS16949 requirements

Supply Chain

Sustainable Growth

Customer Experience

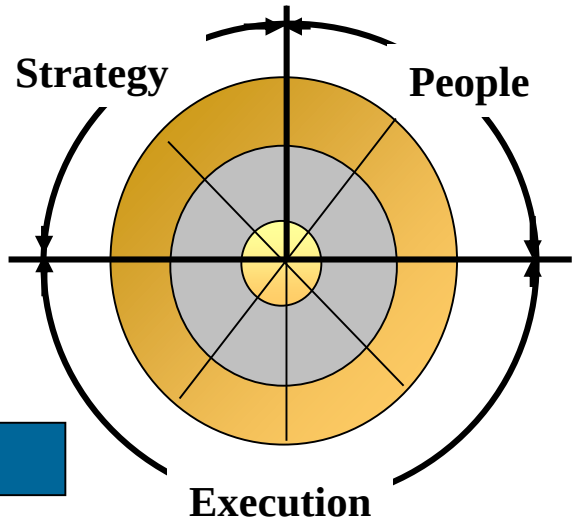
Fulfill Demand ⟷ **Create Demand**

Supply Chain Performance

Operational Performance

Suppliers → **DuPont** → **Customers**

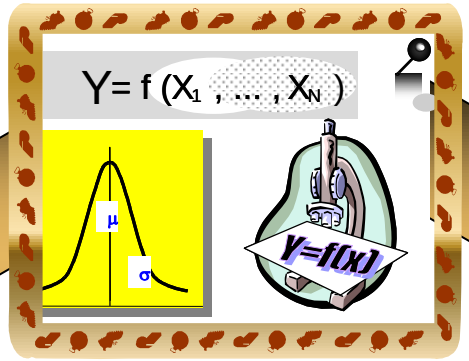
6-Sigma & Lean



Integrated Improvement … Six Sigma, Lean and Supply Chain

Six Sigma

Lean



Supply Chain

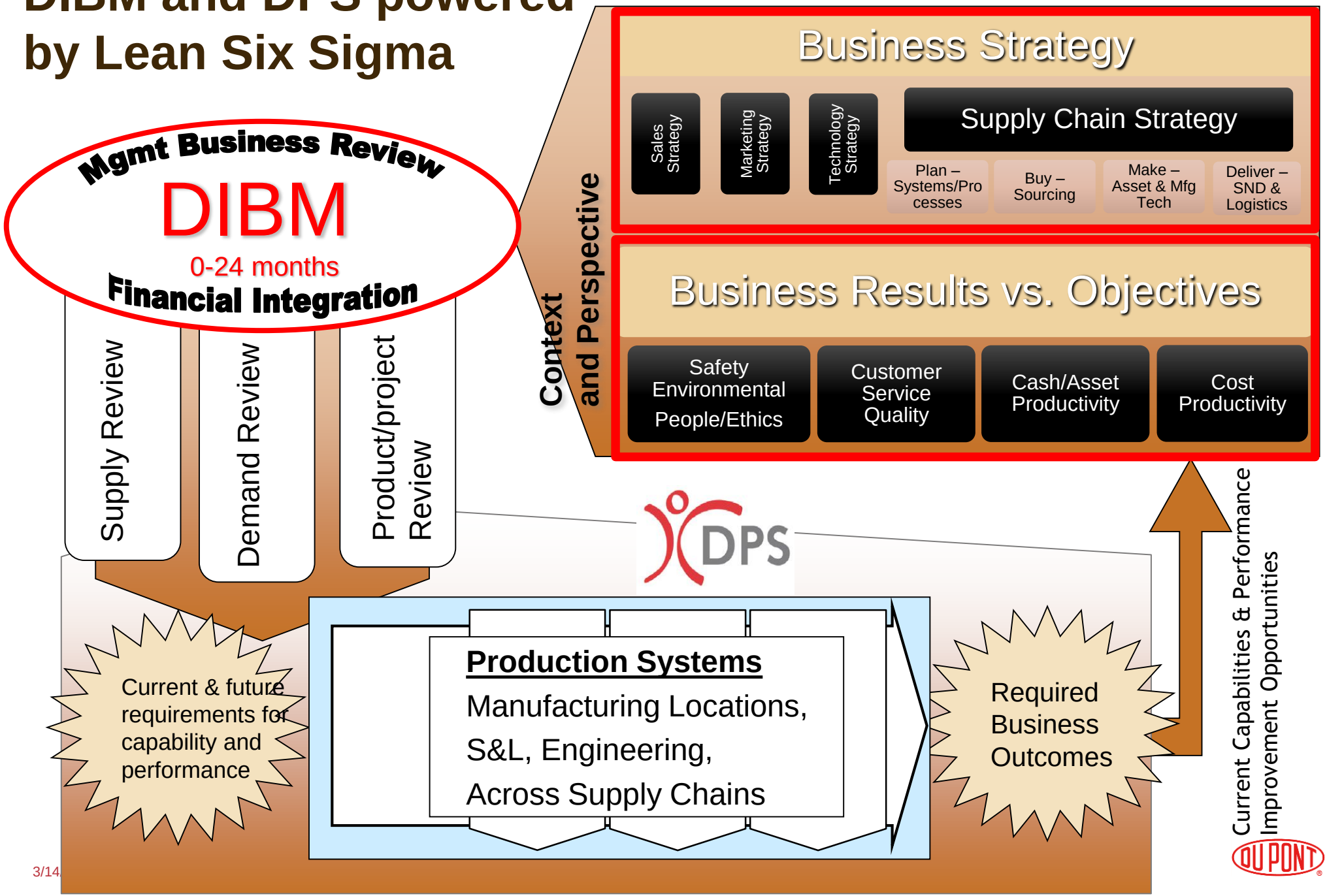
- Speed of improvement
- Variation reduction
- "How" Problems are Solved
- Continuous Improvement

- Speed in the value chain
- Waste elimination
- Value stream redesign
- Pull vs Push
- DuPont Production System (DPS)

- Optimization of Process, Policy, Organization, and Systems
- DuPont Integrated Business Management (DIBM)

Integrated Approach Maximizes Results!

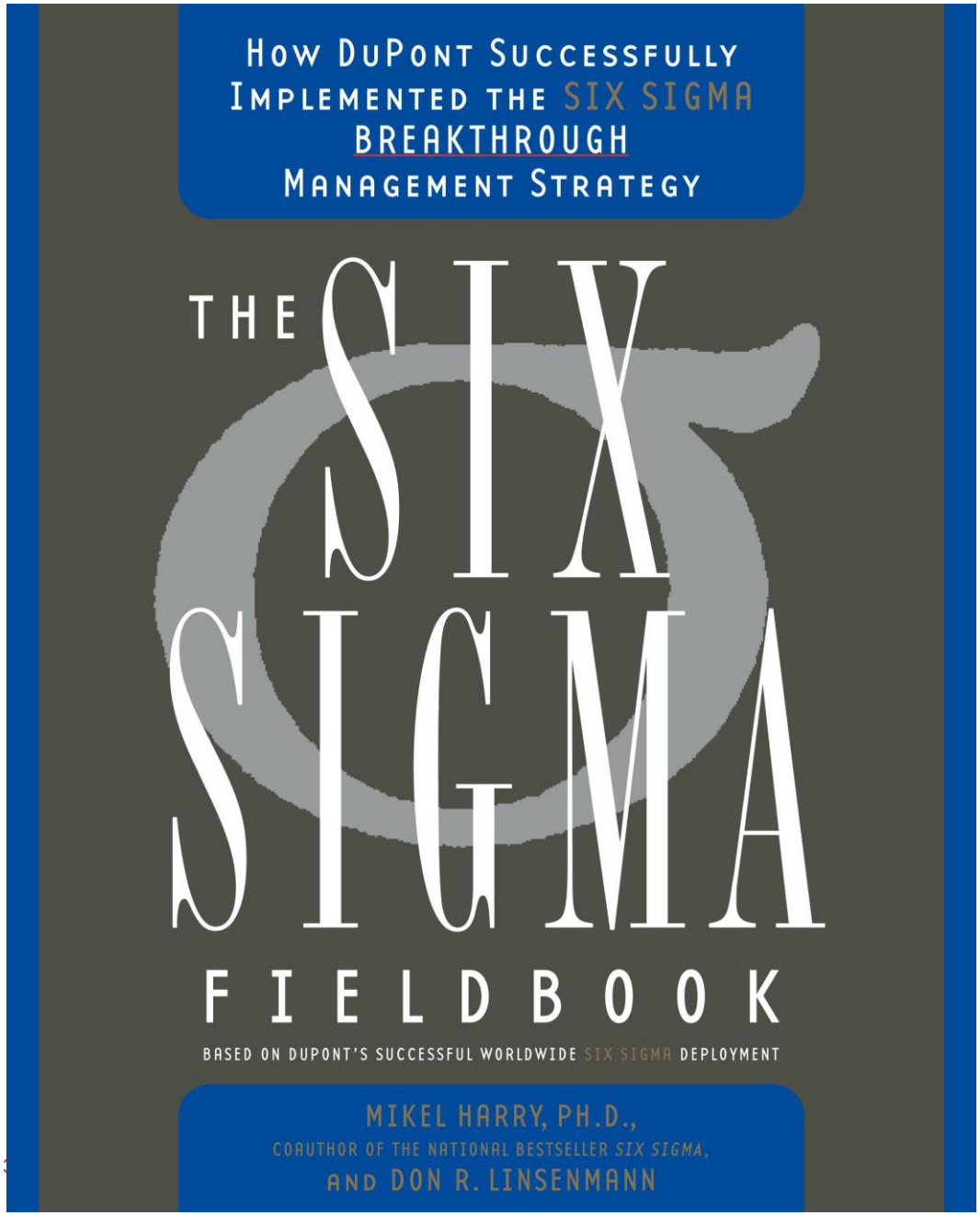
DIBM and DPS powered by Lean Six Sigma



Critical Success Factors

- Leadership Commitment
- Resource Commitment
- Data/Technical Rigor
- Tracking Results to the Bottom Line
- Celebrate your Successes

The Best but the Hardest Thing a Company May Ever Do !



For more on DuPont's Six Sigma deployment, "read the book" (by Mikal Harry and Don Linsenmann)

Don Linsenmann, DuPont Six Sigma Highlighted in *iSixSigma*

Don Linsenmann, vice president and corporate champion, Six Sigma, and the DuPont Six Sigma network of Champions are highlighted in the May/June edition of *iSixSigma* magazine. The article focuses on how Don and the team have driven billions of dollars in financial benefits for DuPont.

"In the seven years Don Linsenmann has championed Six Sigma at DuPont, he has upheld the company's long tradition of adaptation and, as a result, achieved remarkable results," the article said.

The article traces Six Sigma's roots at DuPont. The program was deployed in 1999 and to date, 20,000 Green Belts, 3,000 Black Belts, and 360 Master Black Belts have been trained. There have been 9,800 projects completed and there are 10,200 in progress. The network of Champions Don created has been responsible for nearly 10,000 completed projects and in year two alone realized $1 billion in annualized benefits.

"One of the biggest challenges of the company-wide Six Sigma deployment, Linsenmann said, was finding a way to bring into the Six Sigma fold all of DuPont's semi-autonomous individual businesses," the article said.

"A diagnostic of each business was conducted to determine where it was, as opposed to where it wanted to be. The diagnostic looked for issues such as production quality, fixed cost and variable cost, and inventory issues. The leaders then returned to work to share their knowledge with their own business teams, and selected a Champion for each individual business."

"Whatever is out there, we will deal with it – now that Six Sigma is how we do our work," Don said.

* Optional

Information Security Threat Level
Click for details
GREEN

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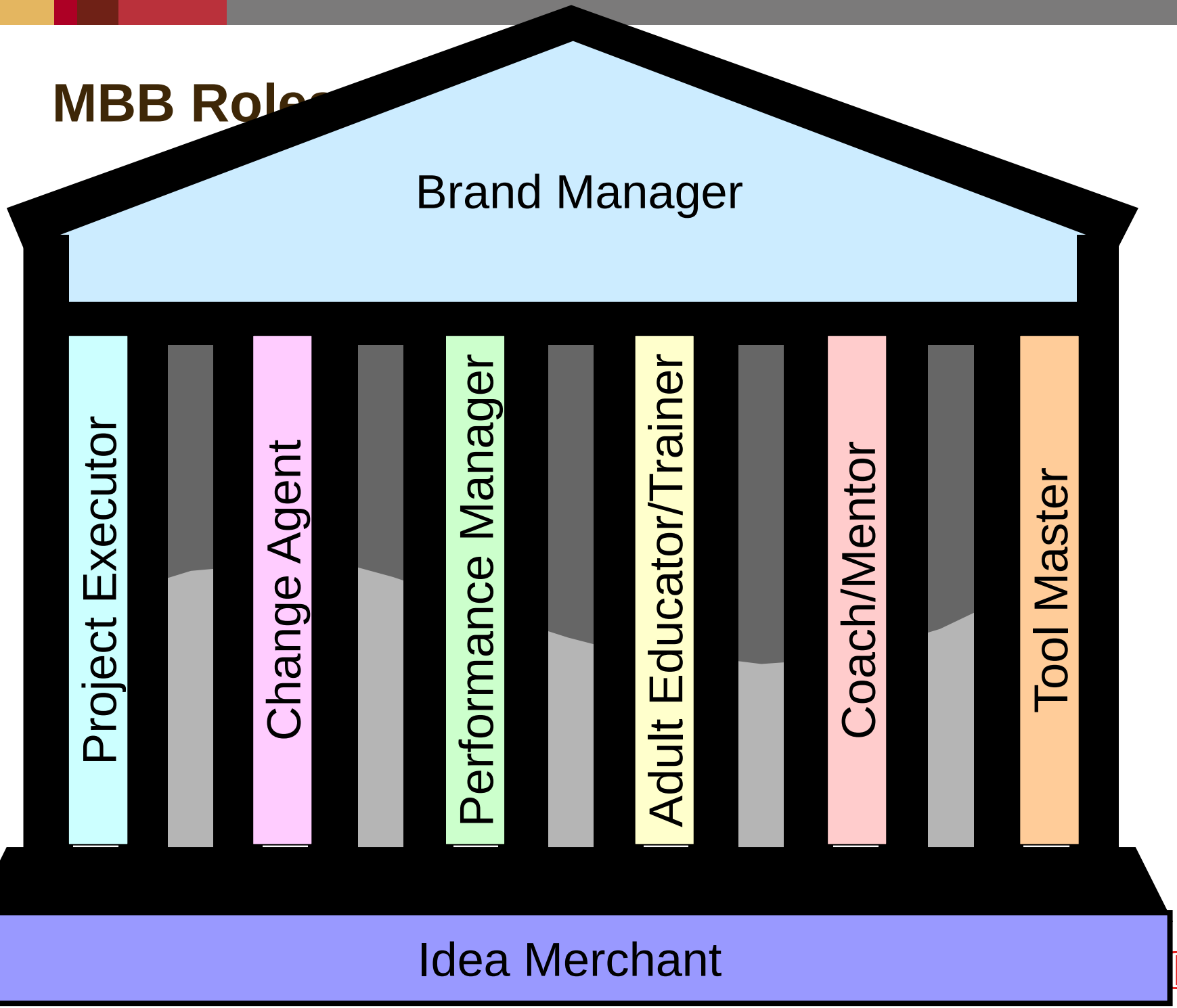
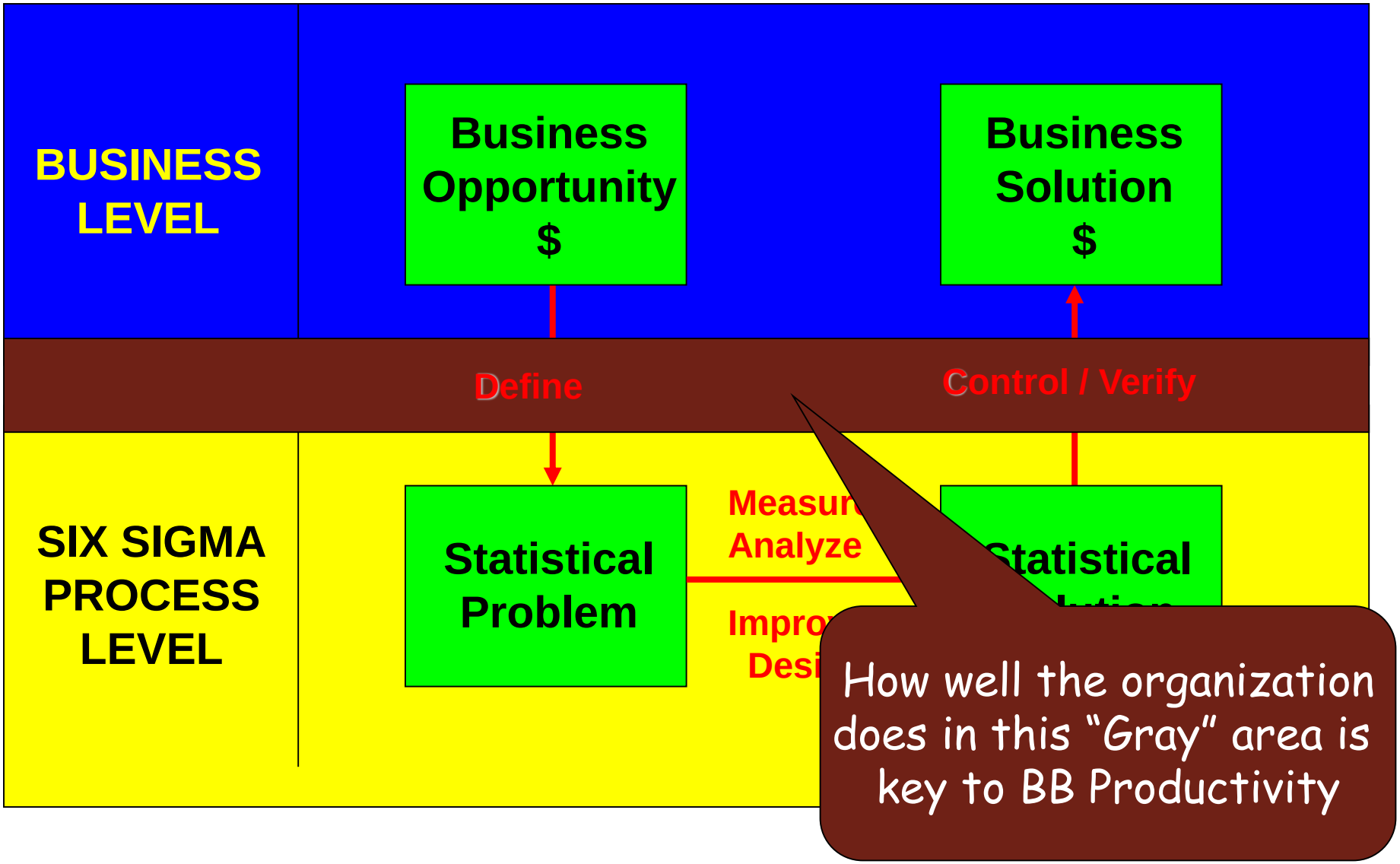
"DuPont Six Sigma" Brand: Deployment Practices

- **Champion and MBB roles (as seen on next chart): Brand Manager, Idea Merchant, Project Executor, Tool Master, Change Agent, Adult Educator/Trainer, Mentor/Coach, Performance Manager**
- **Practices related to the Performance Manager role**
  - **Push Practices: Critical to Quality (CTQ) Flowdown, Pipeline of Ready to Assign (RTA) Projects,**
  - **Project Execution Practices: Specification Limits on Belt Performance, Gatekeeping Reviews**
  - **Pull Practices: Project Turnover Process, Sustain the Gains (STG) Audits**
- **Infrastructure practices for Governance, Human Resources, Information Technology and Finance**

MBB Role

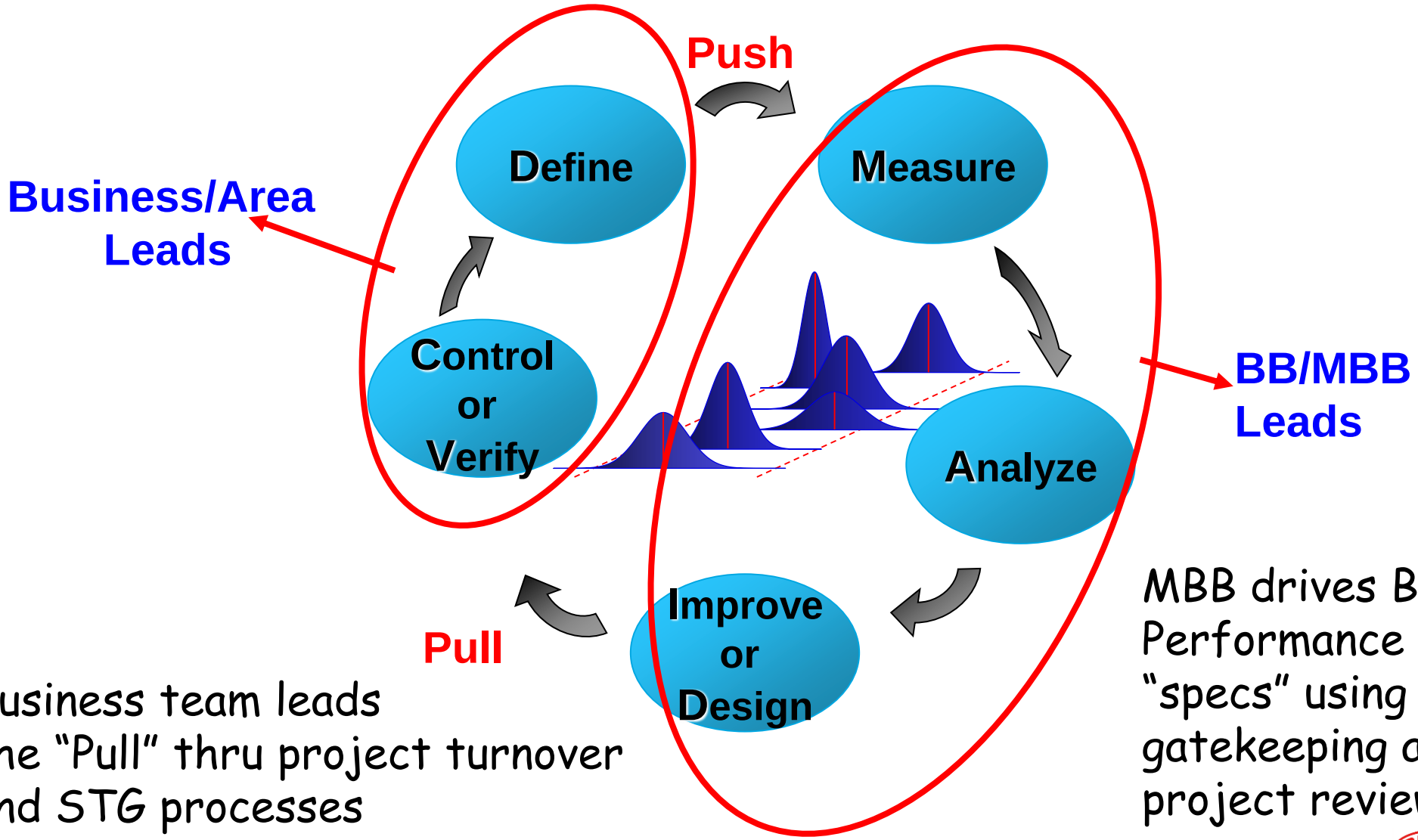

Brand Manager
Project Executor
Change Agent
Performance Manager
Adult Educator/Trainer
Coach/Mentor
Tool Master
Idea Merchant

The Business Interface with Six Sigma



The Push/Pull Model for Gray Area Excellence

Business team leads the "Push" thru CTQ Flowdown and RTA processes



Business team leads the "Pull" thru project turnover and STG processes

MBB drives BB Performance "specs" using gatekeeping and project reviews

Performance Management Practices

- Push Processes

  -- Critical to Quality (CTQ) Flowdowns
  -- Ready To Assign (RTA) guidelines and metrics

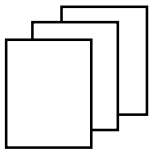
- Performance Processes

  -- LSL limits on projects and $$ per year per BB
  -- Guidelines on gatekeeping and project reviews

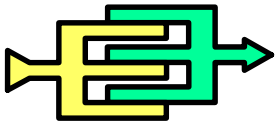
- Pull Processes

  -- Project turnover
  -- Sustain The Gain (STG) audits

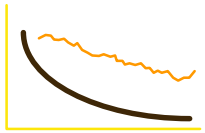
Critical to Quality (CTQ) Flowdown Process



Strategic Plan

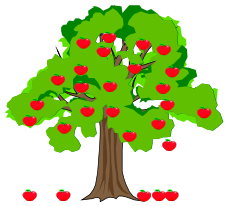


Customer Inputs



Performance Metrics

COPQ



Sweet to Low Hanging Fruit

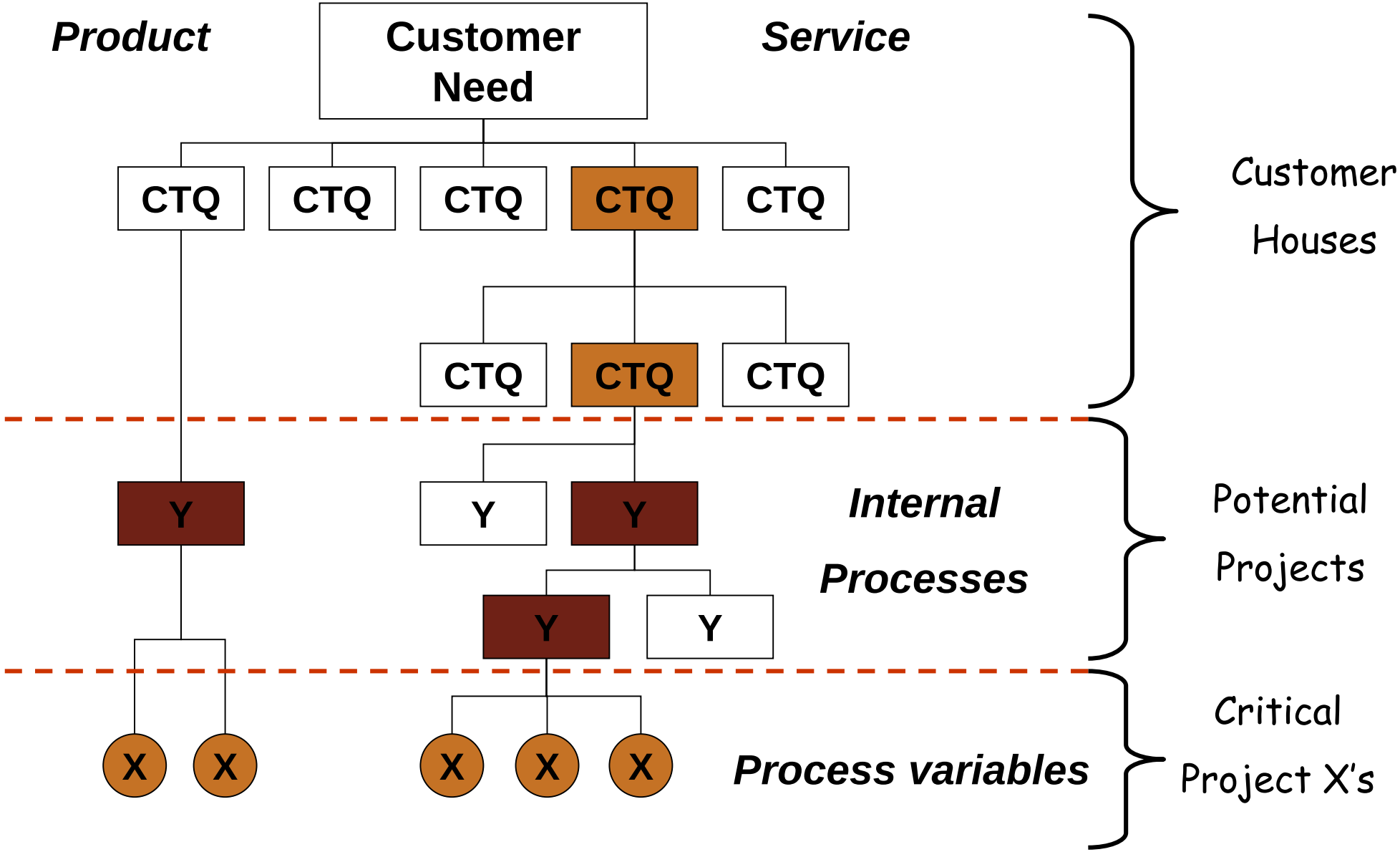
Projects

Improved Customer Satisfaction and Profits

$

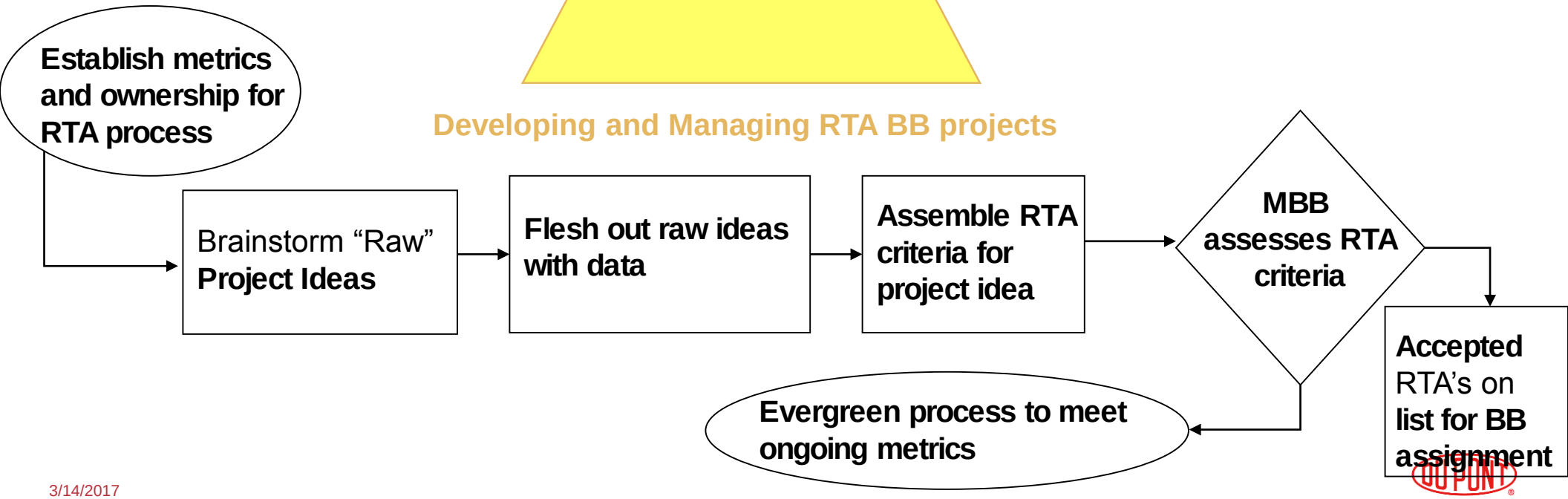
CTQ Flowdown is the systematic roadmap that leads an organization from HERE to HERE

CTQ Flowdown: Generic Example of Generating Project Ideas



Ready To Assign (RTA) Process -- High Level Map

S	I	P	O	C
• Business Team • Customers	• Business CTQ Flowdown info • Process Owners • Green Belts • MBB	Developing and Managing RTA BB projects	• Evergreen list of RTA projects • Increased BB productivity • Increased business results	• External Customers • Internal Business Team • Six Sigma Community (BB's, MBB's, Champs)



What is needed for a project to be considered RTA?

Six Sigma Project Definition - Key Criteria

1. Customer Requirement(s)
2. Problem Statement
3. Project Objective
4. Project Scope
5. Project Metrics and Historical Performance
6. Financial Benefits
7. Key Business Contact

Additional Supporting Information

(needed prior to project kickoff)

8. Project Team Members
9. Timeline for Project Execution

Establish Performance Specs thru Discussion of Contributions (DOC)

- BB Accountability
  - -- Should have specific metrics in their DOC on Productivity
    - Example: $/yr -> LSL $600M Hard with target of $1 MM
      proj/yr -> LSL of 3 with target of 5

- GB Accountability
  - -- Should consider DOC deliverables to drive BB Productivity
    - Examples: develop RTA's -> LSL of 3 per year with target of 5
      assist with area CTQ flowdown
      serve on BB teams -> LSL of 1 target of 2

- MBB/Champion Accountability
  - -- Should have specific metrics in their DOC for assuring BB & GB productivity eg BB certification, BB Productivity, GB Certification

- Line Leader Accountability
  - -- Should have DOC metrics similar to MBB and Champions for their BB's and GB's. Project Cycle Time is a leading metric for this group

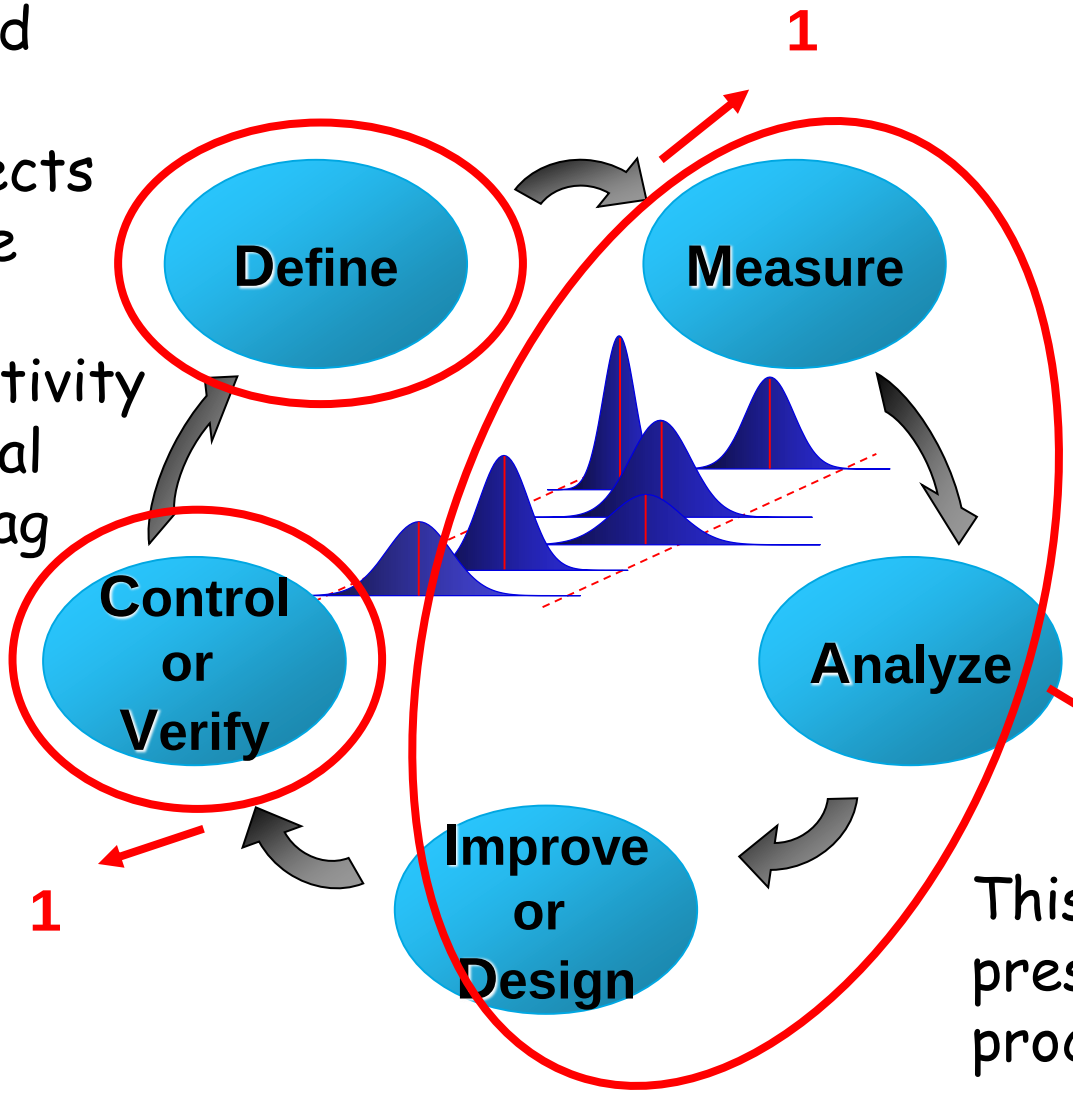
BB Performance Metrics

Simultaneous Project Model Example

Ideal BB workload

BB's have 3 projects going on at a time

Mitigates Productivity drop if a individual project hits a snag



By staging projects in this fashion, BB minimizes the # of teams meeting at the same time

This really puts the pressure on the RTA process because you need 5 projects per BB

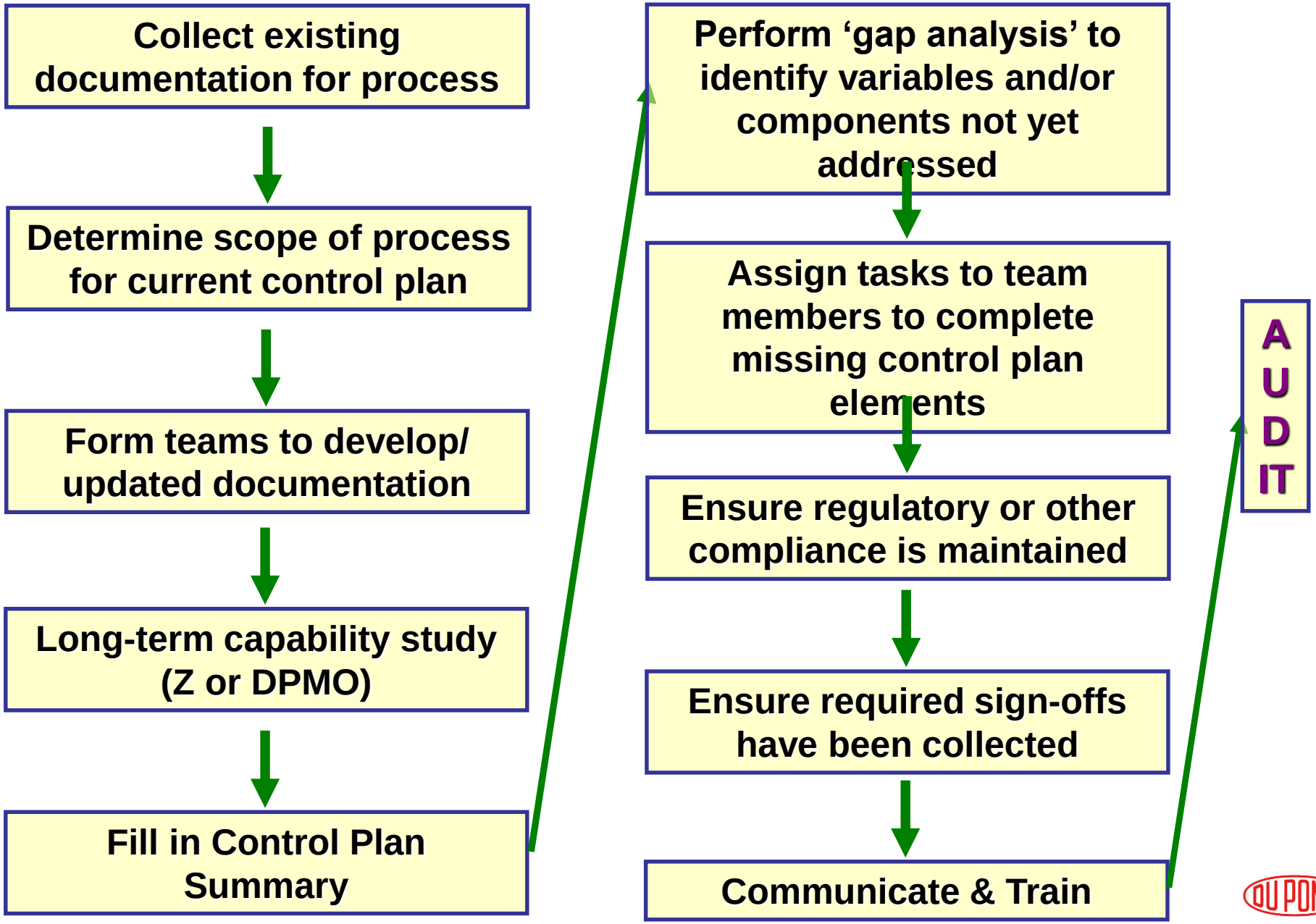
BB Performance Processes: Meetings and Reviews

- Types of Meetings
  - -- Project Team meetings
  - -- Process Owner/Area Leadership reviews
  - -- Gatekeeping reviews
  - -- Project reviews
- Goals of each type
- Logistics of each type
  - -- Suggested Frequency
  - -- Format and content
  - -- target audience

Meeting and Reviews Summary

- Some organizations may not see the need for 4 different types of meetings (small Sites, only a few BB's per leadership team, etc)
- Important to recognize though that there are 4 different levels of content in these discussions and all 4 need to be covered in some regular fashion
- BB's have to be very aware of the resource commitment they are consuming (team members, MBB, area leadership) and need to view "time" as a defect

"Turnover" (Control Plan Transition) Process Flow



What are Sustain The Gains (STG) Audits?

Lets use a Safety Health and Environment (SHE) analogy to put Sustain The Gains (STG) audits in context

- First Party Process Safety Management (PSM) Audit
  - -- An operating unit audits itself vs its own procedures
  - -- Done on a routine basis, considered part of normal work
- Second Party PSM Audit
  - -- A Site or Business Team conducts an audit of the operating area on how well it is following Site and Area procedures
  - -- Done less often than 1st party, but still several times a year
- Third Party PSM Audit
  - -- External organization (OSHA, State regulator, or Corporate SHE Committee) audits the operating area on how well it is following established external standards
  - -- Non-routine, very formal, in-frequent

Sustain The Gains (STG) Audits

- STG Audits are analogous to Second Party PSM audits

  -- They are meant to compliment the routine efforts the individual area or business teams are doing around assuring Control Plan maintenance and realization of the validated savings (these are analogous to 1st party audits).

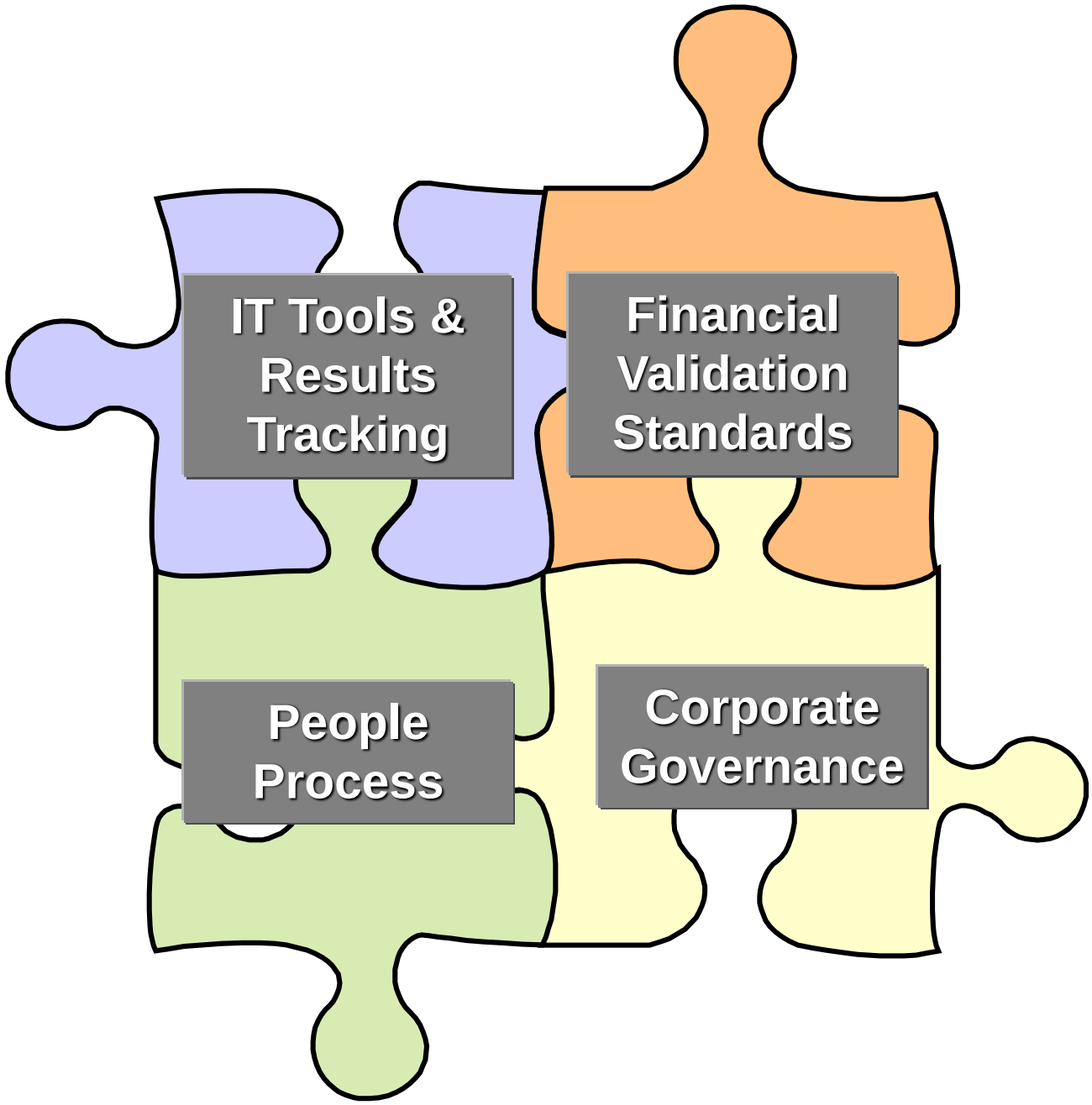
  -- A Site based leader (eg Plant Manager) serves as the lead auditor

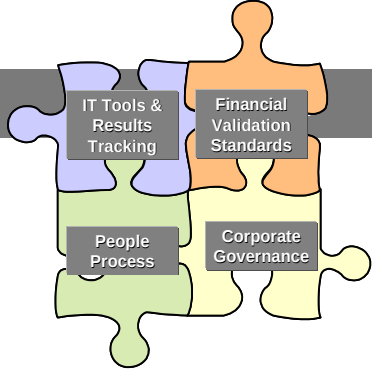
- Third Party audits were also conducted in 2002
  - -- Corporate Finance put together an audit protocol
  - -- Statistical sampling of projects
  - -- Control Plans compliance, project Y and $ changes assessed

Infrastructure Practices

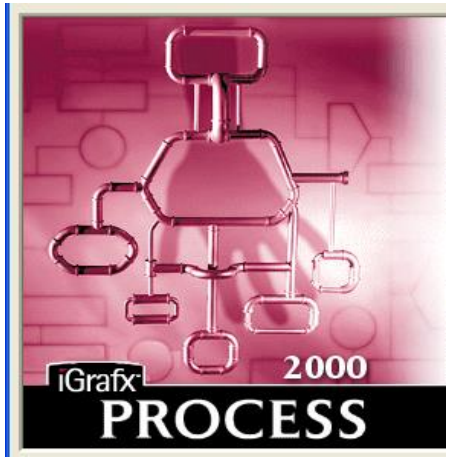
- **Overall Governance of Six Sigma Deployment**
- **Practices related to Human Resources: Certification, Rewards and Recognition, Promotion**
- **Practices related to Information Technology: Project Management Systems, Project Execution Tools,**
- **Practices related to Finance: Validation Rules, Audits**
- **Other Practices for Replicating the Gains in Lean Six Sigma**

Six Sigma Infrastructure is Important



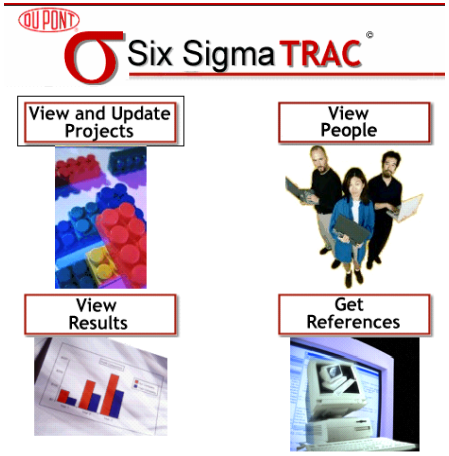


IT Tools

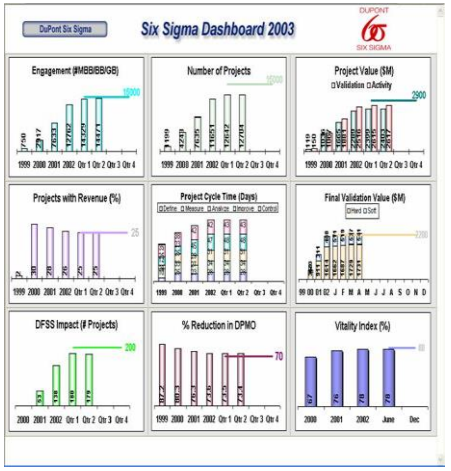


Process Mapping and modeling

Statistical Analysis



Project Tracking and Management

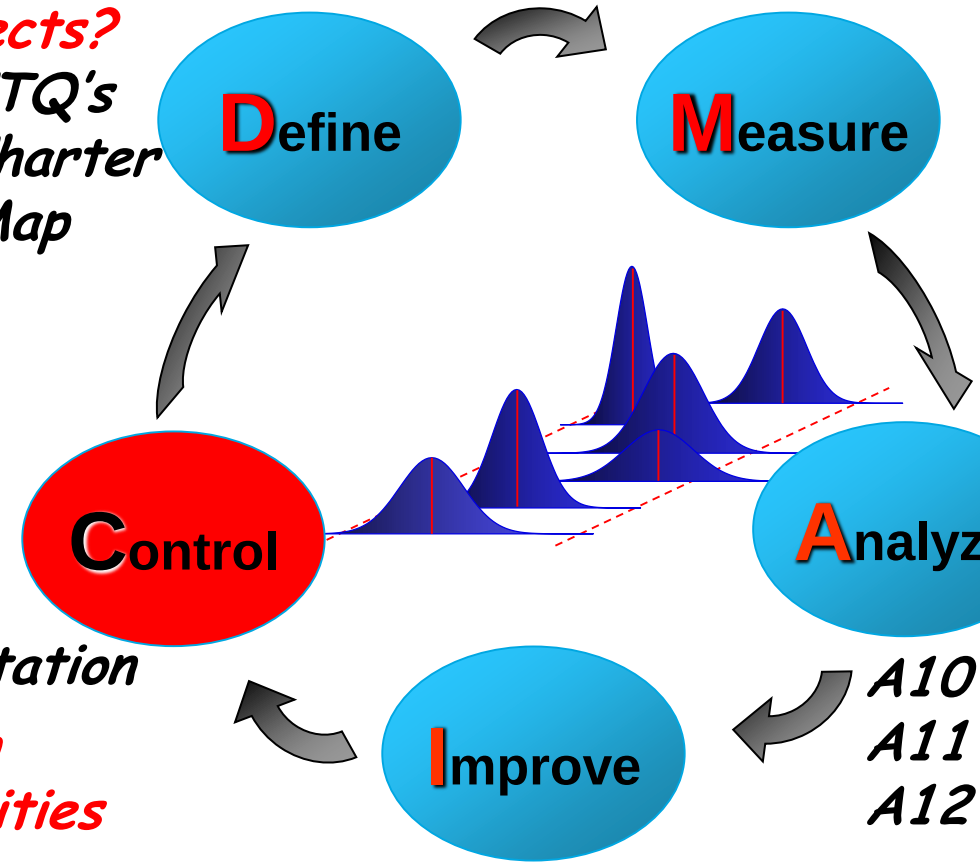


Corporate Roll-up Management Dashboard

DMAIC Deliverables

Replicating the Gains in Lean and Six Sigma Projects

D0 – Past projects?
D1 - Project CTQ's
D2 - Project Charter
D3 - Process Map



M4 - Project Y
M5 - Performance Standards
M6 - Data Collection Plan & MSA
M7 - Project Y Data
M8 - Process Capability
M9 - Improvement Goal

C15-Sustained Solution
C16-Project Documentation
C17-Translation Opportunities

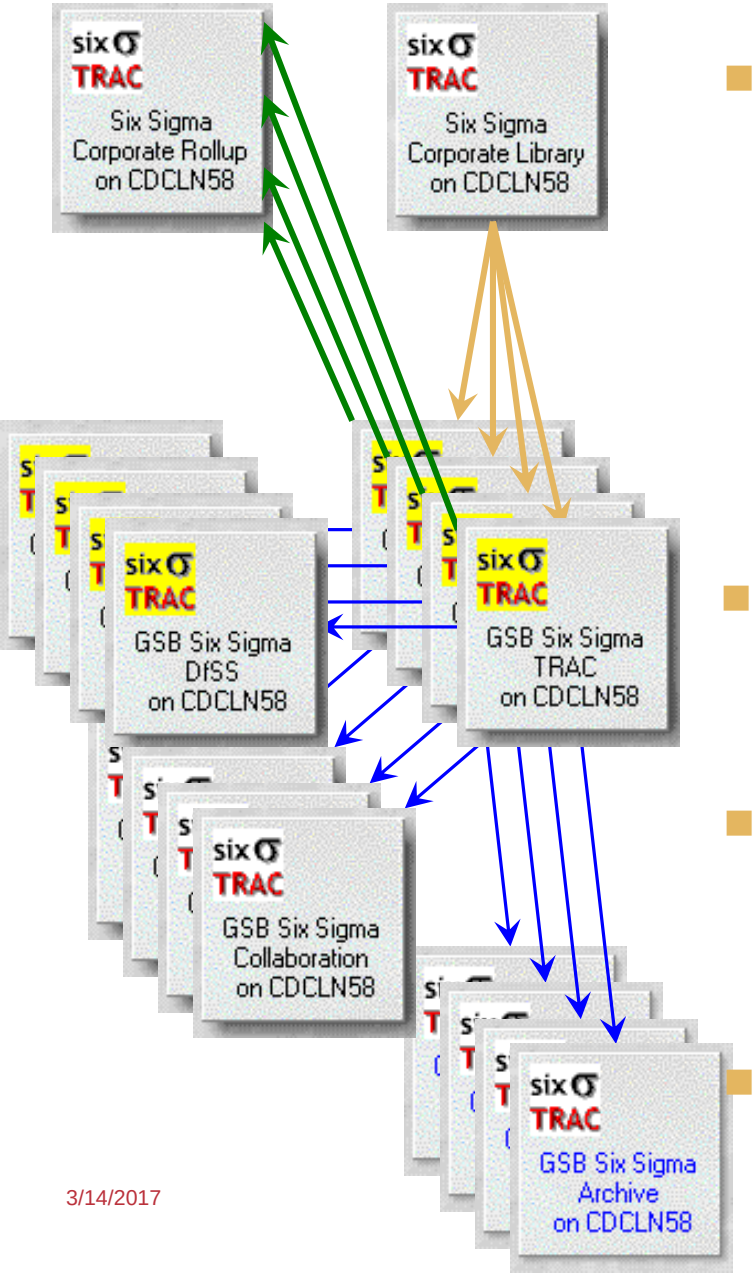
A10 - Prioritized List of X's
A11 - List of Vital Few X's
A12 – Quantified Financial Opportunity

I13 - Proposed Solution
I14 – Piloted Solution

Generation 1: DuPont Six Sigma TRAC Overview

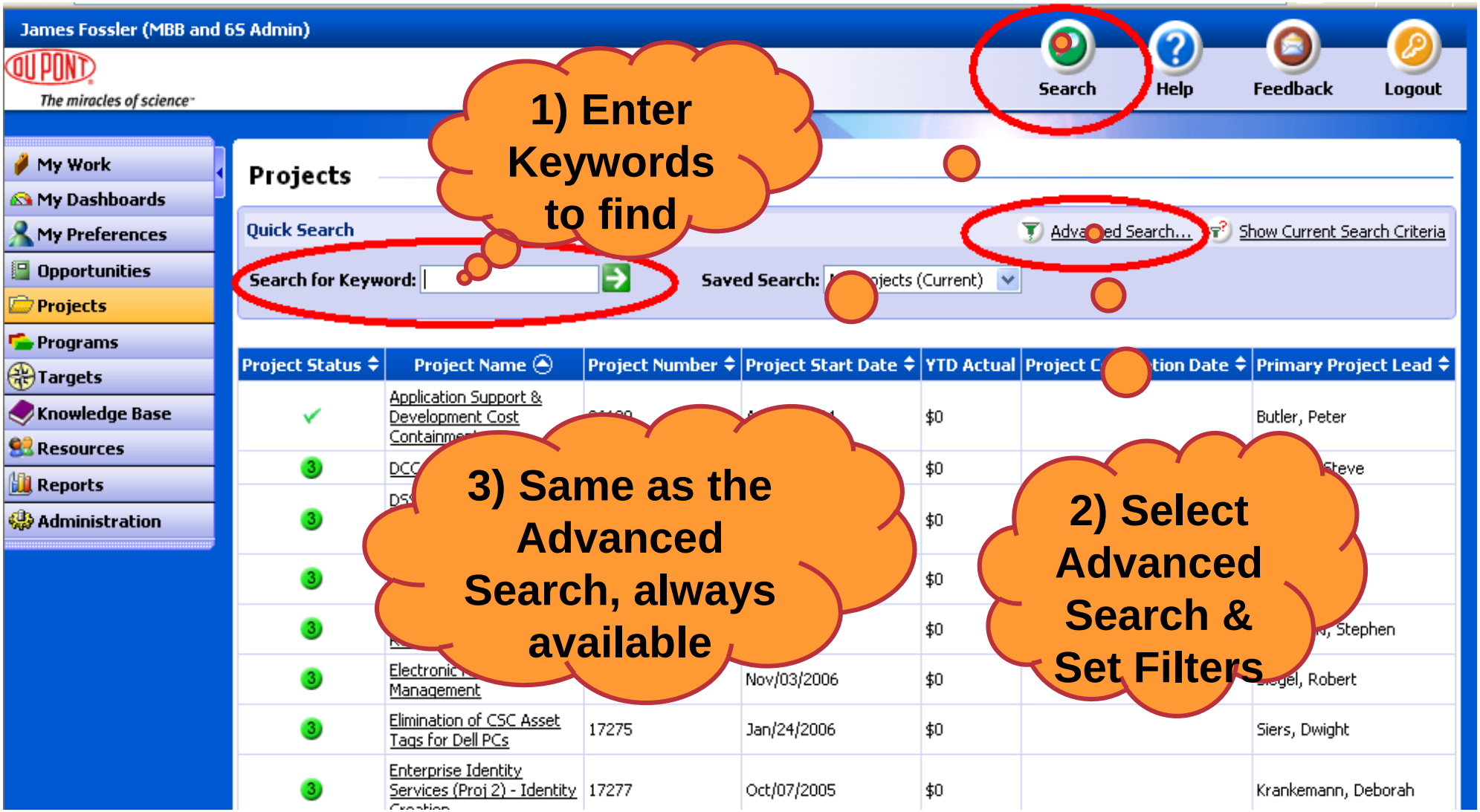
Generation 2: DuPont Six Sigma Enterprise Tracking (DSSET)

Generation 3: DuPont Six Sigma Basics (DSSB)



- Six Sigma TRAC has 4 databases
  - ↗Six Sigma TRAC
  - ↗Collaboration
  - ↗DfSS (Design for Six Sigma)
  - ↗Archive
- Each SBU has same 4 database structure
  - ↗All Six Sigma roles access some or all databases
- Corporate Library and Rollup
  - ↗Rollup of all SBU TRAC information daily
- Moved to DSSET in 2007 and DSSB in 2014

Three Ways to Search in DSSET



Corporate Rollups from Six Sigma TRAC

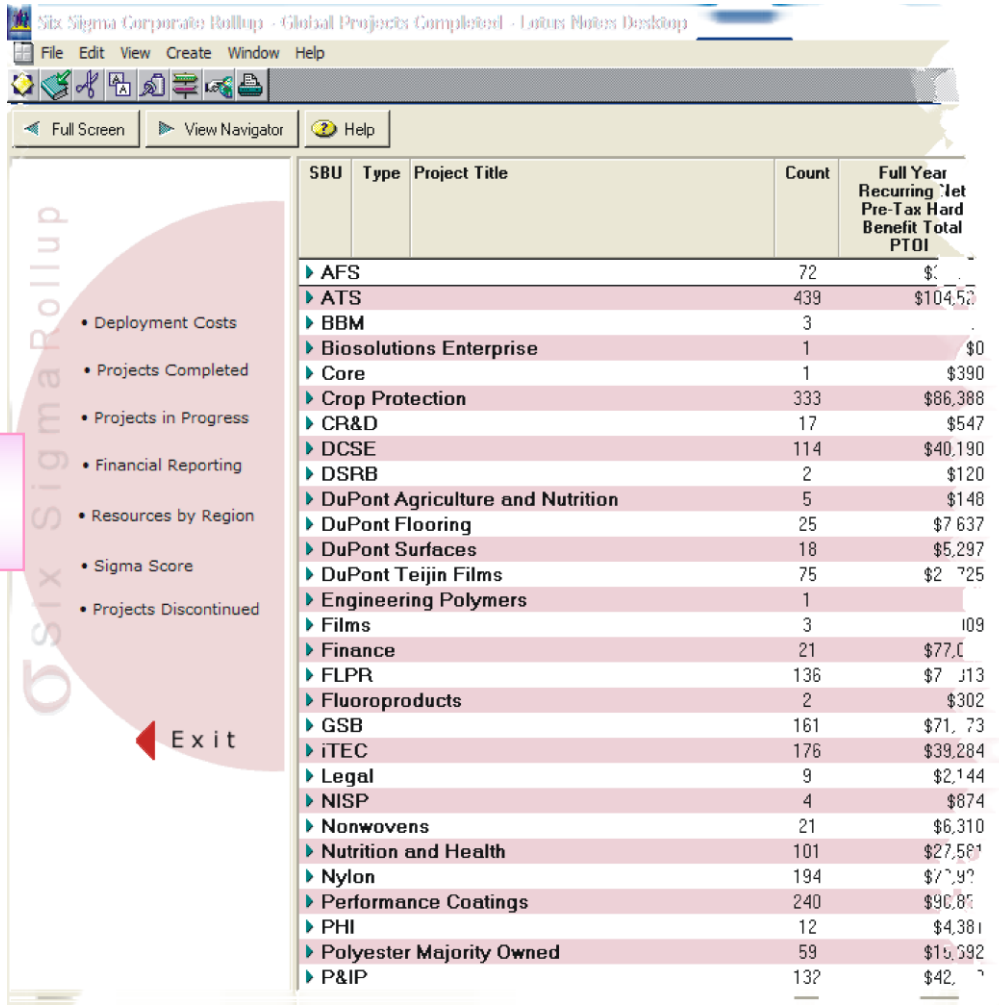
six σ TRAC
Six Sigma Corporate Rollup on CDCLN58

Rollup done daily for Corporation

Feeder for Six Sigma Dashboard

By SBU

- Deployment Costs
- Projects Completed
- Projects in Progress
- Financial Reporting
- Resources by Region
- Sigma Score
- Projects Discontinued



SBU	Type	Project Title	Count	Full Year Recurring Net Pre-Tax Hard Benefit Total PTOI
AFS			72	$
ATS			439	$104,52
BBM			3	
Biosolutions Enterprise			1	$0
Core			1	$390
Crop Protection			333	$86,388
CR&D			17	$547
DCSE			114	$40,190
DSRB			2	$120
DuPont Agriculture and Nutrition			5	$148
DuPont Flooring			25	$7 637
DuPont Surfaces			18	$5,297
DuPont Teijin Films			75	$2 725
Engineering Polymers			1	
Films			3	09
Finance			21	$77,0
FLPR			136	$7 013
Fluoroproducts			2	$302
GSB			161	$71, 73
iTEC			176	$39,284
Legal			9	$2,144
NISP			4	$874
Nonwovens			21	$6,310
Nutrition and Health			101	$27,581
Nylon			194	$7 ,9?
Performance Coatings			240	$90,8?
PHI			12	$4,381
Polyester Majority Owned			59	$15,392
P&IP			132	$42,

DuPont Six Sigma Dashboard - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

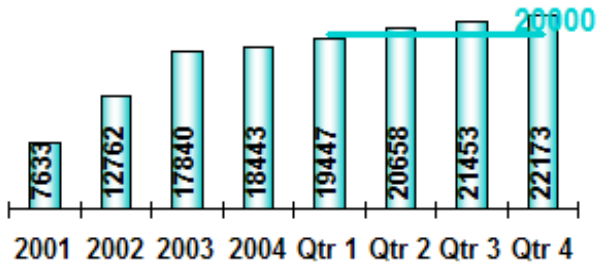
Address http://cdcrs230.lvs.dupont.com/sixsigmadashboard/Test_Dashboar Go Links DuPont Six Sigma - Home Page DuPont Six Sigma Dashboard

DuPont Six Sigma

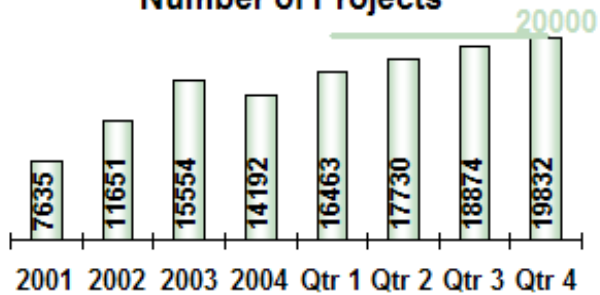
Six Sigma Dashboard 2005

DUPONT SIX SIGMA

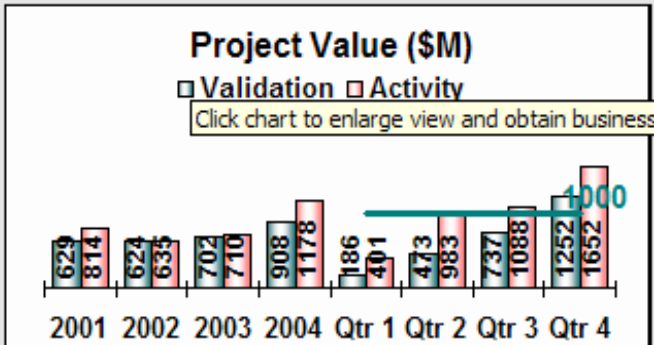
Engagement (#MBB/BB/GB)



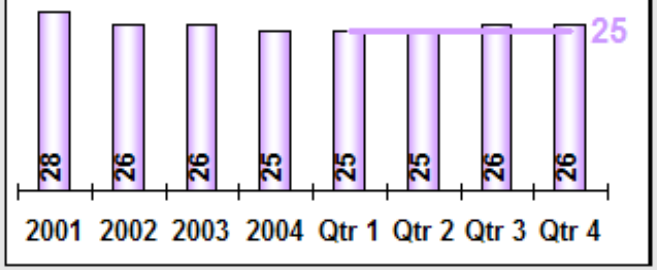
Number of Projects



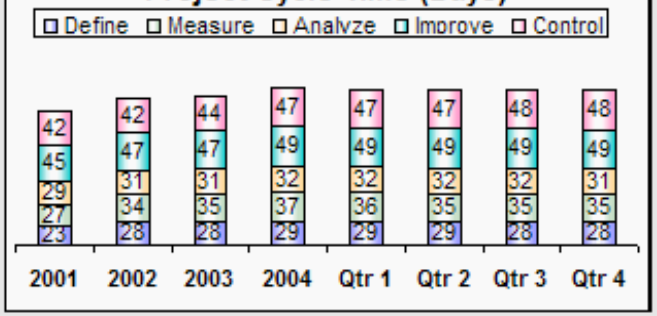
Project Value ($M)



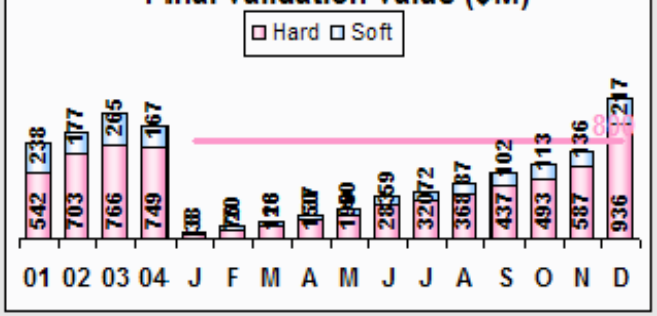
Projects with Revenue (%)



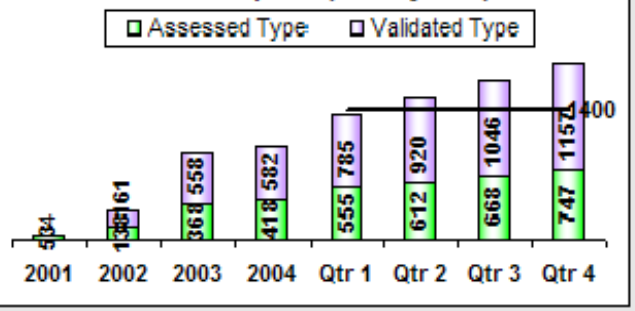
Project Cycle Time (Days)



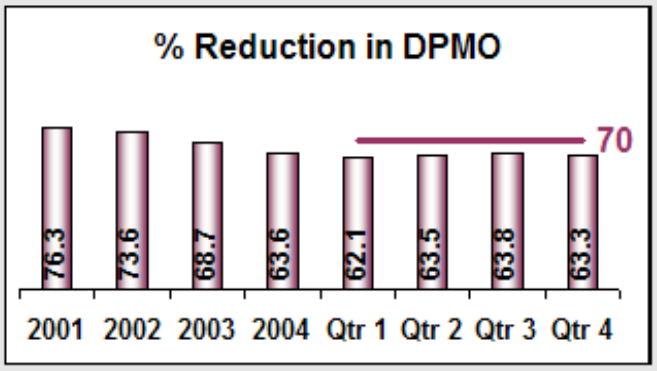
Final Validation Value ($M)



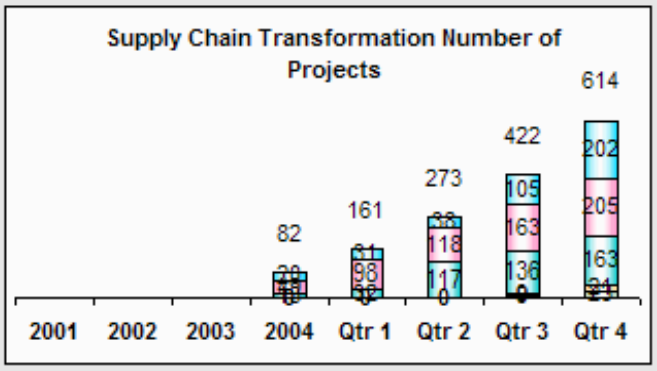
DFSS Impact (# Projects)



% Reduction in DPMO

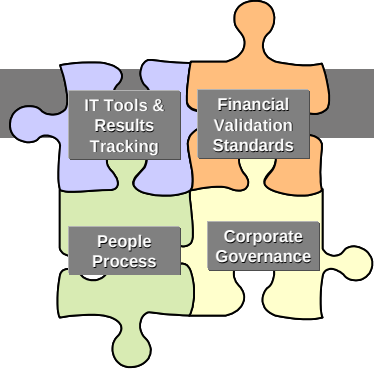


Supply Chain Transformation Number of Projects



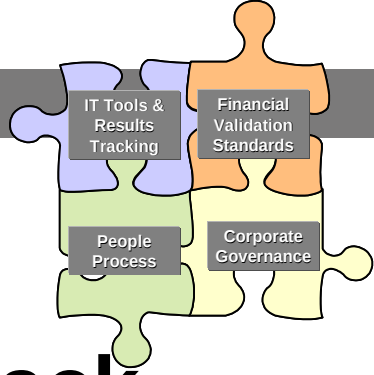
http://cdcrs230.lvs.dupont.com/sixsigmadashboard/Test_Dashboard_HTML/2005%20Year%20End/Html/ProjectValueInformation2.htm Local intranet

Financial Validation Standards



- **Common Corporate standards for validating Six Sigma Project Benefits**
- **Training process for people authorized to validate**
- **Finance network to manage consistency over time**
- **Audit process for control plan effectiveness and assessing project benefits over time**

Common People Processes



- **Corporate Certification Process for Black Belts, Master Black Belts and Champions**
- **Training standards for GBs, BBs, MBBs, Champions**
- **Stock and Cash Options for BBs and MBBs**
- **Green Belt Certification required for Promotions for Senior Leaders and Professionals**
- **Full time Six Sigma Assignment required for people designated as corporate promotables**

DuPont Black Belt Certification requirements

A BB must be full-time and satisfy all of the following:

1. Successfully complete four weeks of project-based Black Belt training delivered by a certified Master Black Belt.

2. Successfully lead at least two improvement projects through all phases of DMAIC or DMADV, where turnover to process owner constitutes completion of the Control Phase.

3. Achieve a cumulative minimum of $350M Hard Pre-Tax Operating Income (PTOI) Final Validation benefits on projects.

4. Remain in the Black Belt role for a minimum of 18 months.

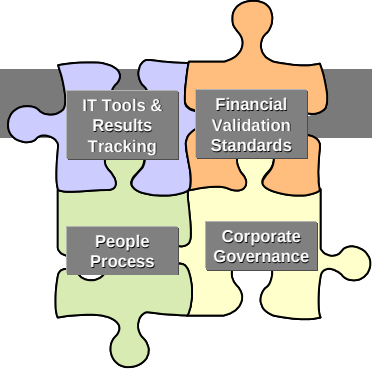
5. Certification will normally occur within 24 months of beginning training, however, it must be achieved within 30 months.

SIX SIGMA PROMOTIONAL REQUIREMENTS - CORPORATE POLICY

Promotions require Six Sigma competency (minimum GB certification)

Promotions to	Beginning
Senior Leaders	1/1/2004
Leaders	1/1/2005
Career Level	1/1/2006
Up to Career Level	SBU/Function Discretion

Promotables require Six Sigma competency with fulltime BB/MBB or Champion role beginning June 2004



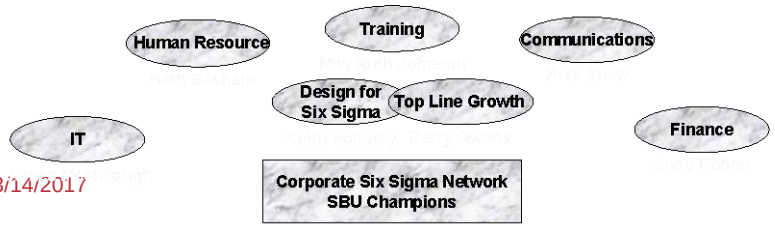
Corporate Governance

Clear "federal" requirements managed by VP level corporate leader and a network of SBU champions

Network subteams to develop Six Sigma best practices and recommend "federal" rules

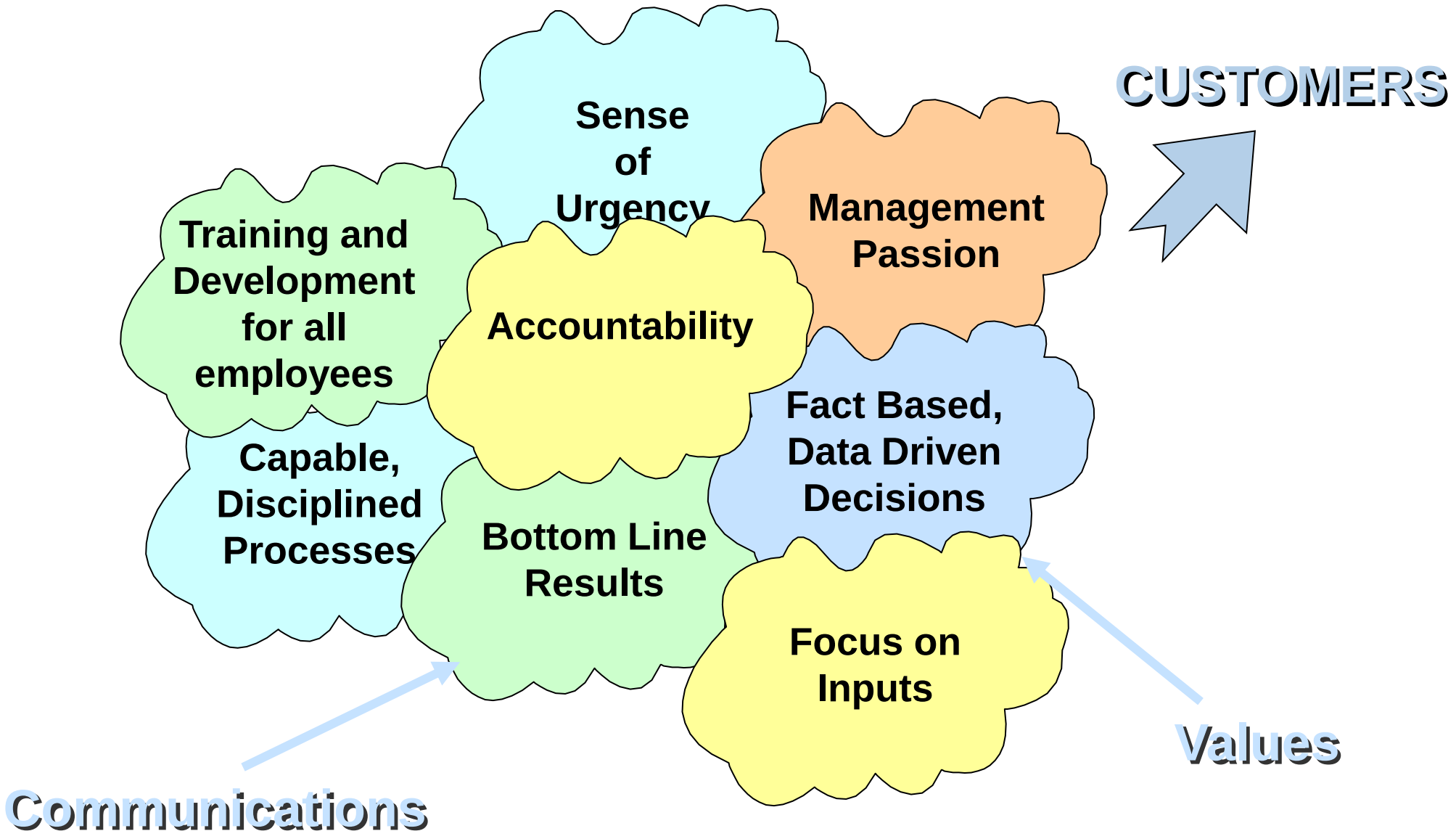
SBU champions together with SBU leadership teams govern implementation specifics for each individual business

Common Six Sigma targets set each year by the CEO and corporate officers



Six Sigma Network

We have been developing a six sigma culture …



Wrap-Up:
Key Learnings in DuPont's Six Sigma Journey

- **Commitment of Senior Leadership**
- **Full time six sigma resources as project leaders and change agents**
- **Visible data, tracking and results**
- **Integration into vision, strategy, tactics and actions**
- **People!**
- **Keep re-energizing – don't assume natural regeneration**

And finally, a look ahead to 2016 and beyond …

Fourth Quarter 2015

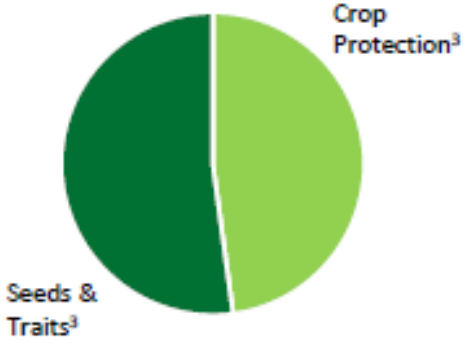
- Corporate Six Sigma Champion Don Linsenmann retires (as all DuPont corporate officers are required to do at age 65) – Don now does executive transformation mentoring
- CEO Ellen Kullman (who succeeded Chad Holliday in 2008) retires
- DuPont and Dow announce their intent to merge (to become DowDuPont) and then split into three companies

2016 and beyond

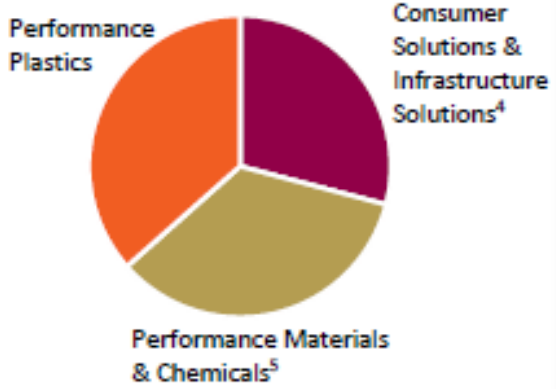
- Six Sigma MBB Network Leader Steve Bailey retires – now doing statistics and six sigma consulting and training (independently and for ASQ and SSA&Co)
- See next charts for description of DowDuPont (note merger not complete yet) and the subsequent three companies

Creates Global Leaders Based on Strong Industrial Logic

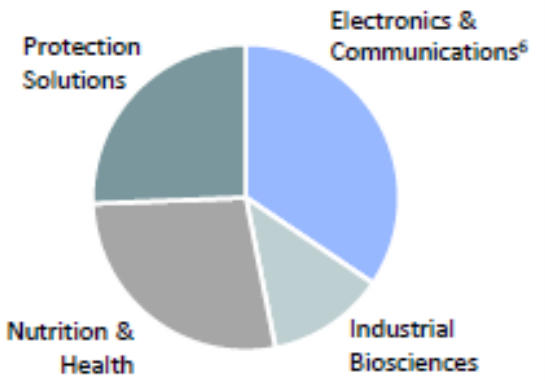
Agriculture
Net Sales: **~$16B**[1]
Adj. EBITDA: **~$3B**[2]



Material Science
Net Sales: **~$46B**[1]
Adjusted Net Sales: **~$51B**[1]
Adj. EBITDA: **~$10B**[2]

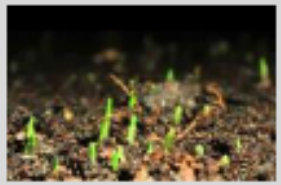


Specialty Products
Net Sales: **~$12B**[1]
Adj. EBITDA: **~$3B**[2]



INDUSTRY LEADERS FOCUSED ON CORE COMPETENCIES

Broad offering and robust pipeline across germplasm, biotech traits and crop protection

Low-cost integration and innovation combined with expanded customer offerings in key growth sectors


World-class innovation process and application development capabilities

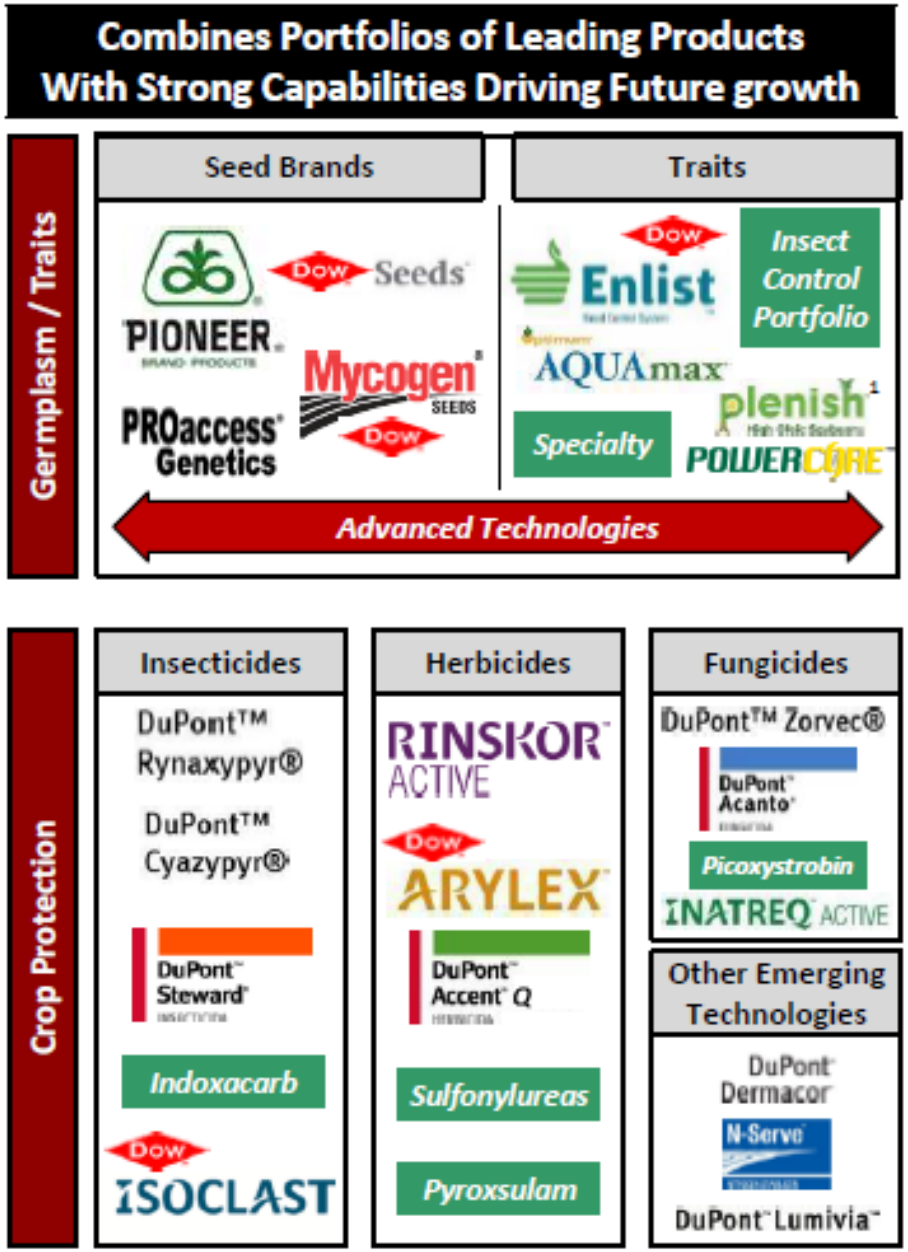

Attractive Investment Profiles with Stronger Product Offerings to Better Serve Customers

Note: Numbers may not sum due to rounding.
1.Based on Dow and DuPont's Net Sales as reported in each company' 2015 Form 10-K filing. Adjusted Net Sales includes revenue attributable to Dow Corning Corporation's Silicones businesses in 2015. 2. Refer to slide 26 in the appendix for definition of Adjusted EBITDA for Dow and DuPont as included in Amendment No. 3 to the Form S-4 filed on June 7, 2016. 3. Allocates Dow and DuPont Ag segment sales by business. 4. Includes Dow Corning Silicones businesses. 5. Includes DuPont Performance Materials. 6. Includes DuPont Electronics and Communications and Dow Electronic Materials.

Ag Co: World-Leading, Comprehensive Agriculture Business

Most Comprehensive and Diverse Seed and Crop Protection Portfolio

- World's leading production agriculture business with most comprehensive, balanced and diverse seed and crop protection portfolio with exceptional opportunity for growth
- Rich history and sustainable commitment to production agriculture focused on delivering solutions to growers around the world
- Robust innovation pipeline of germplasm, biotech traits and crop protection technologies that enable the delivery of a broader suite of stronger products to the market
- Enhanced scale and multiple routes-to-market allow broader reach of complementary offerings and enable deeper customer intimacy that will drive increased grower productivity and profitability globally



1. This product is fully approved in the U.S. and Canada. Traits included in these products may or may not be approved in all global markets.

Material Co: Low-Cost Integration & Value-Added Innovation

Underpinned by Operational and Commercial Excellence

ADVANTAGED BACK-INTEGRATION

Building Blocks

- Ethylene
- Propylene
- Silicones

WORLD-CLASS SCIENCE AND ENGINEERING CAPABILITIES

Platforms

- High-Throughput Research
- Catalyst Discovery & Ligand Synthesis
- Polymer Science (DUPONT)
- Material Science (DUPONT)
- Formulation Sciences
- Process Engineering (DUPONT)
- High-Performance Computer Modeling
- Application Development (DUPONT)

NARROWER, DEEPER END MARKET PRESENCE

Solutions

- Packaging
- Transportation
- Infrastructure
- Consumer
- Energy/Water
- Durables & Industrial

~85% OF REVENUE FOCUSED IN THREE KEY END MARKETS

Packaging

- A leader in thermoplastics, elastomers, finished parts and biopolymers
- One of the world's largest packaging materials suppliers
- A leading global provider to the electrical and telecommunications industry

Transportation

- A leader with broad portfolio of solutions, spanning "under the hood", exteriors and "in the car"
- A leader in OEM glass bonding, aftermarket glass bonding, structural bonding and brake fluids
- #2 position in rubber-to-metal bonding and polyurethane systems applications for tier suppliers
- A leader in silicones for sealing, specialty lubrication and bonding
- A leader in lightweighting platforms for transmissions, driveline and structural bonding

Infrastructure

- Greatest breadth of acrylic chain technologies, including industry-leading positions in acrylic binders, HEUR rheology modifiers, dispersants and opaque polymers
- A leader in extruded polystyrene foam insulation and cellulosic-based construction chemical additives
- A leader in one-component foams in retail and acrylic-based construction chemicals in North America
- A leader in silicone sealants, coatings, adhesives & glazing

DOW DUPONT

Specialty Products Co: Focused on Attractive Secular Growth End-Markets Where Innovative Science Capabilities Provide Clear Competitive Advantage

- **Unique businesses that share similar investment characteristics and focus on specialty products**
- **Core strengths in product innovation and application development:** Clear capital allocation focus and strong product pipelines
- **Strong portfolio of differentiated offerings:** Highly technical, knowledge-intensive businesses with attractive margins
- **Leading brands and customer intimacy:** Tyvek®, Kevlar®, Nomex®, Corian®, Kapton®, Tedlar®, Danisco® and Genencor®
- **Scale across portfolio:** Global leadership in each business segment

	Electronics	Protection Solutions	Nutrition & Health	Industrial Biosciences
				
Leading Positions	• Solar PV materials • CMP pads • Lithographic materials • Metallization materials • Flexible circuit materials	• Aramid fibers & paper • Protective garments • Solid surface materials • Non-woven films	• Cultures & probiotics • Texturants & ingredient systems • Emulsifiers • Soy proteins	• Industrial enzymes • Biomaterials (Sorona® and Bio-PDO) • Advanced biofuels
Growth Opportunities	• New Display Technologies • Higher Efficiency PV Modules • Heat Dissipation & Thermal Management in Electronics	• Next-Gen Polymers for Demanding Applications • Tyvek® in Filtration and Water Management	• Probiotics & Prebiotics • Systems Solutions • Healthy Offerings for Emerging Geographies	• Probiotics for Animal Nutrition • New Enzymes for Food, Home & Personal Care • Specialty Apparel Applications

Applications of Industrial Biotechnology Across Markets

Key Global Consumer Needs Driving Company Growth

Steven P. Bailey

Professional Biography

- **36.5-year DuPont career (1979-2016) spent with the corporate Applied Statistics Group, most recently as Principal Consultant and MBB**
- **Led DuPont's Master Black Belt Network (2000-2015)**
- **Coordinated, developed and delivered BB, MBB, and Champion training (2001-2015)**
- **President and Chairman of the Board of the American Society for Quality (ASQ) 1997-99**
- **BB and MBB certified by both DuPont and ASQ**
- **Received his BS, MS and PhD in Statistics from the University of Wisconsin (1974, 1975, 1979).**

Personal Biography

Born: Indianapolis, Indiana

Hometown: Milwaukee, Wisconsin (actually two suburbs – Shorewood and Wauwatosa)

Education: B.S., M.S., Ph.D. degrees in Statistics from the Univ of Wisconsin in 1970s

Family: Wife Marg, 3 daughters, 7 grandkids

Personal Interest Items: Golf, bowling, movies, all Wisconsin college and professional sports (Packers, Badgers, Brewers, etc)