



AIR
LAND
SEA
SPACE
CYBER

Establishment of an Enterprise Measurement System

Jim Stubbe
Raytheon Company
Enterprise Measurement Lead
7/11/11

Agenda

Raytheon Raytheon Overview



Measurement Space



Challenges



Enablers



Results / Conclusions

A Continuing Journey

WHO WE ARE



- A technology and innovation leader specializing in defense, homeland security and other government markets throughout the world
- 2010 net sales: \$25 billion
- 72,000 employees worldwide
- Headquarters: Waltham, Massachusetts

» *A global leader in technology and innovation*



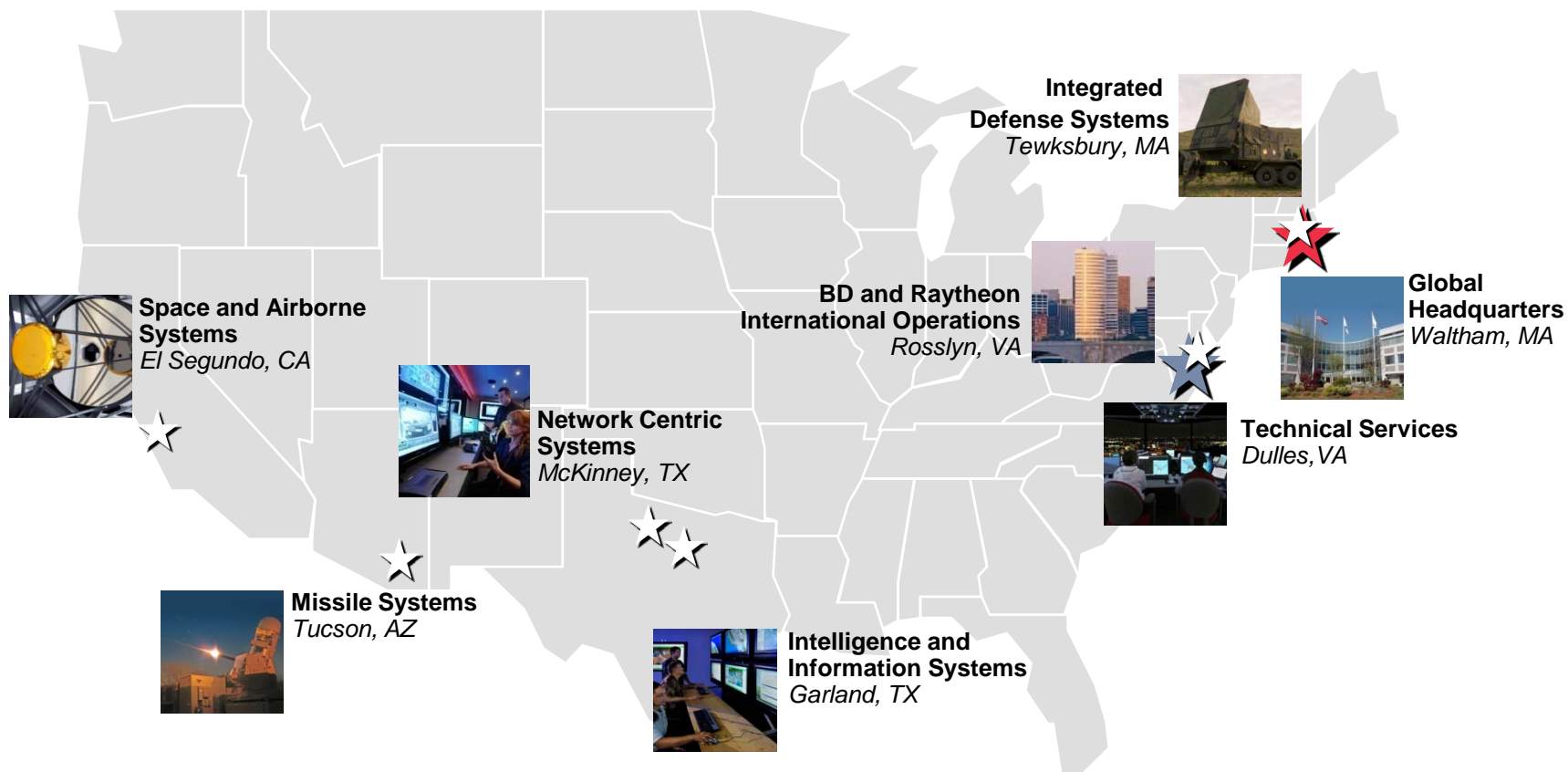
Raytheon is a leading technology and innovation company that consistently provides innovative solutions, service and Mission Support to our global customers. Customer success is our mission.

WHAT WE DO

- Our innovative, effective technologies, CMMI excellence and trusted relationships provide our customers with Mission Assurance performance for their changing operational needs. At Raytheon, promises made are promises kept.
- Our core market capabilities in Sensing, Effects, C3I and Mission Support help us meet the needs of our customers today and their evolving needs of the future.
- Proof Points: Raytheon's world-class talent — 72,000 employees operating around the globe — has a unique understanding of mission requirements and how to apply advanced technology with speed and agility to give our customers a distinct operational advantage.
- Brand values: People, Integrity, Customer Commitment, Product & Service Excellence, Mission Assurance.

» ***Proven performance***

Raytheon Business Headquarters



» **72,000 employees; 2010 net sales: \$25 billion**

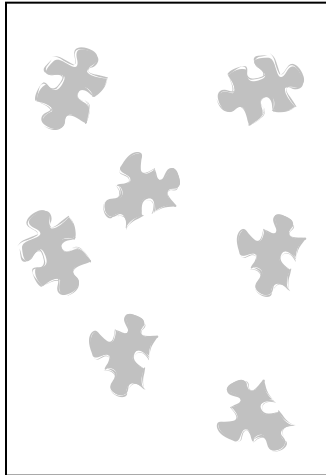


Measurement Space



Enterprise Measurement Structure

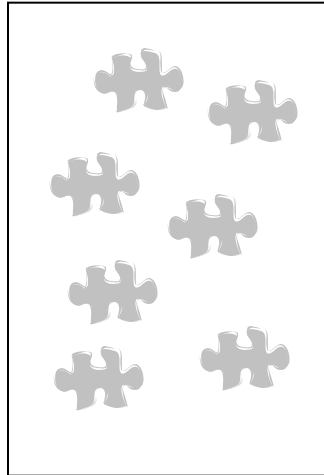
White Space



Starting the journey:

- Engineering CMMI influence
- Different detail within each business
- Bottoms up Measurement Community of Practice (MCOP) established
- Top down leadership established for Measurement Community

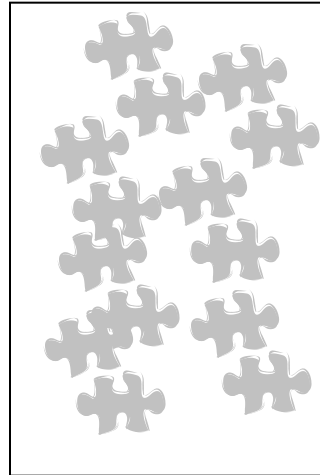
Engineering



Within engineering:

- OPM established
- Definitions and approach aligned
- Measurement roadmaps planned and executed
- Wider engineering measurement community engaged

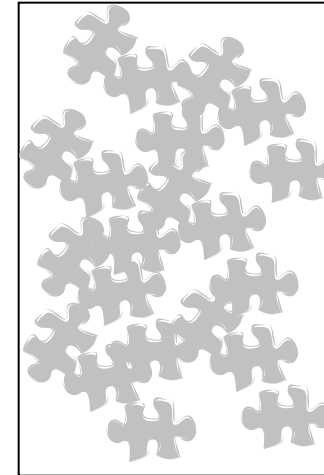
Engineering / Quality



Across Enterprise:

- Reporting approach refined
- Definitions further aligned
- Measurement roadmaps planned and executed
- Wider engineering and quality communities engaged
- Quality leveraged engineering experiences

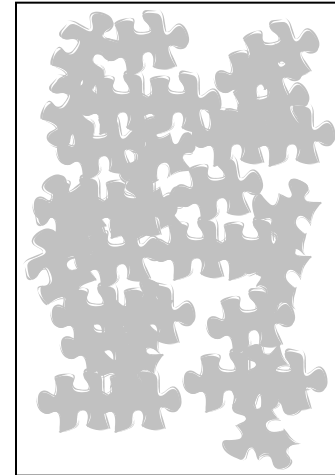
Engineering / Quality / Operations



Across Enterprise:

- Operations had its own approach coming in
- Approach modified to leverage both quality and engineering experiences

Engineering / Quality / Operations / Technology / Supply Chain



Across Enterprise:

- Technology heavily leveraged engineering resources and experience
- Supply Chain working independently adopting infrastructure
- Continuing to build measurement network and experience

2004

2005

2006

2007

2009

Organizational Coverage – Still Some White Space



Measurement Space



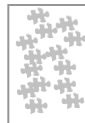
Enterprise Measurement Structure



White Space



Engineering



Engineering /
Quality



Engineering / Quality
/ Operations

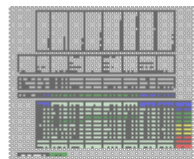


Engineering / Quality
/ Operations / Technology
/ Supply Chain

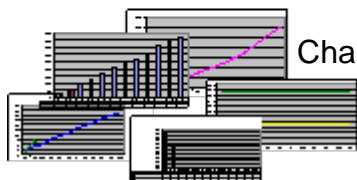


Visible Artifacts

OPM



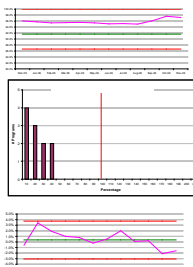
Charts



Starting the journey:

- Engineering defined OPM
- High level measure definition / alignment
- Different detail within each business

Engineering



Quality

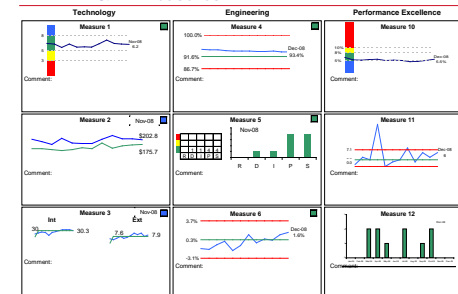


Across Enterprise:

- Reporting approach refined
- Part of executive reviews
- Expectations clearly defined
- Templates automated – still variability
- Definitions further aligned

XXX ET&MA Measures

Raytheon



Across Enterprise:

- Executive dashboard deployed and institutionalized
- Reporting and analysis approaches “enabled”
- Monthly reports rotate functions
- Little room for variability monthly
- Pipeline very active

2004

2005

2006

2007

2009

Visible Artifacts Evolving



Measurement Space



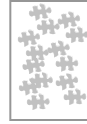
Enterprise Measurement Structure



White Space



Engineering



Engineering / Quality



Engineering / Quality / Operations



Engineering / Quality / Operations / Technology / Supply Chain

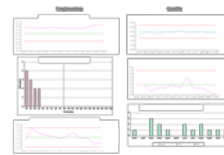
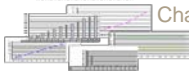


Visible Artifacts

OPM

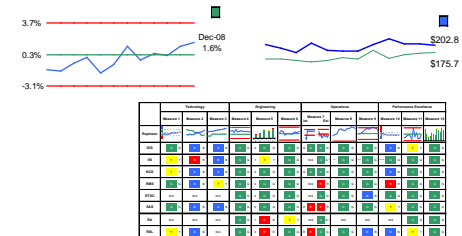
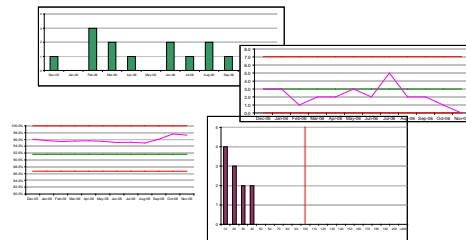


Charts



Coloring the Picture

1.03	1.36	1.50	3.0%	0.36	16
1.02	1.20	1.34	3.3%	0.35	8 Stretch
1.01	1.10	1.17	3.6%	0.35	7 Best
0.99	1.00	1.00	3.9%	0.27	5
0.98	0.95	0.90	4.3%	0.24	5
0.96	0.90	0.80	4.9%	0.23	4
0.97	0.85	0.69	4.9%	0.19	4
0.95	0.80	0.58	5.2%	0.15	3 Baseline
0.95	0.75	0.47	5.5%	0.14	2
0.94	0.70	0.38	5.8%	0.12	1
0.93	0.60	0.25	6.1%	0.10	0



Starting the journey:

- OPM score for each business
- Measure scores set by businesses
- Improvements business specific

Across Enterprise:

- “Behavior” standardized
- Each measure establishes threshold / limits
 - Some - enterprise level
 - Some - business level

Across Enterprise:

- Each measure has well understood run rules
- Each measure is color coded
- Monthly report reflects colors with measures
- Dashboard 2009s summary
- Improvements enterprise wide

2004

2005

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2007

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Fine Tuning Focus on Performance



Measurement Space



Enterprise Measurement Structure



White Space



Engineering



Engineering /
Quality



Engineering / Quality
/ Operations

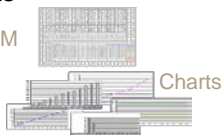


Engineering / Quality
/ Operations / Technology
/ Supply Chain



Visible Artifacts

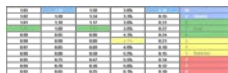
OPM



Charts



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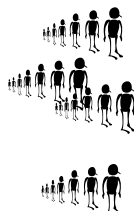


Sponsorship and Accountability

Starting the journey:

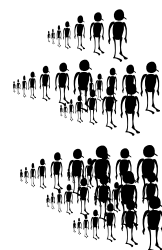


- Leadership holding informal conversations about the measures
- Seeds of strong sponsorship planted
- Data pulled to the top
- Minimal impact on People, Programs, Functions, Source Data or Systems



Across Enterprise:

- Part of formal, monthly business reviews
- Sponsorship from executive leadership and down through the org
- Data still pulled to the top
- Ownership increasing lower in the organization



Across Enterprise:

- Leadership fully engaged and accountable
- Analysis expectations set throughout organization (answer before asked)
- Data pushed to the top
- Mid and lower levels fully engaged and accountable

2004

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Becoming a Part of the Fabric



Measurement Space



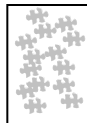
Enterprise Measurement Structure



White Space



Engineering



Engineering /
Quality



Engineering / Quality
/ Operations



Engineering / Quality
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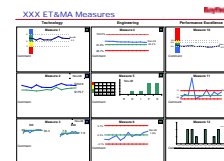
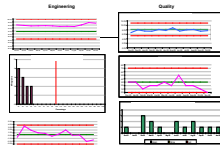
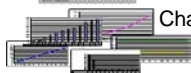


Visible Artifacts

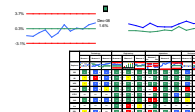
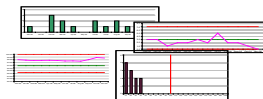
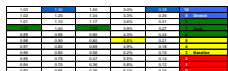
OPM



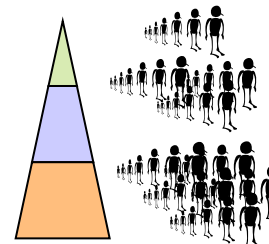
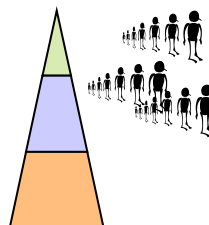
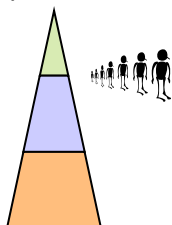
Charts



Coloring the Picture



Sponsorship and Accountability



2004

2005

2006

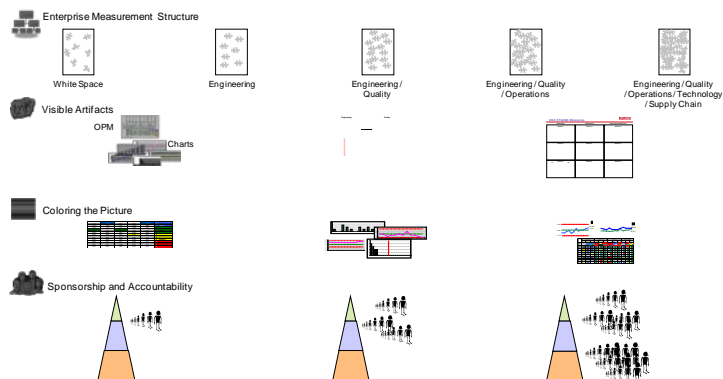
2007

2009

Organization, Enablers, Performance, People



Measurement Space Infrastructure Built - What's Next?



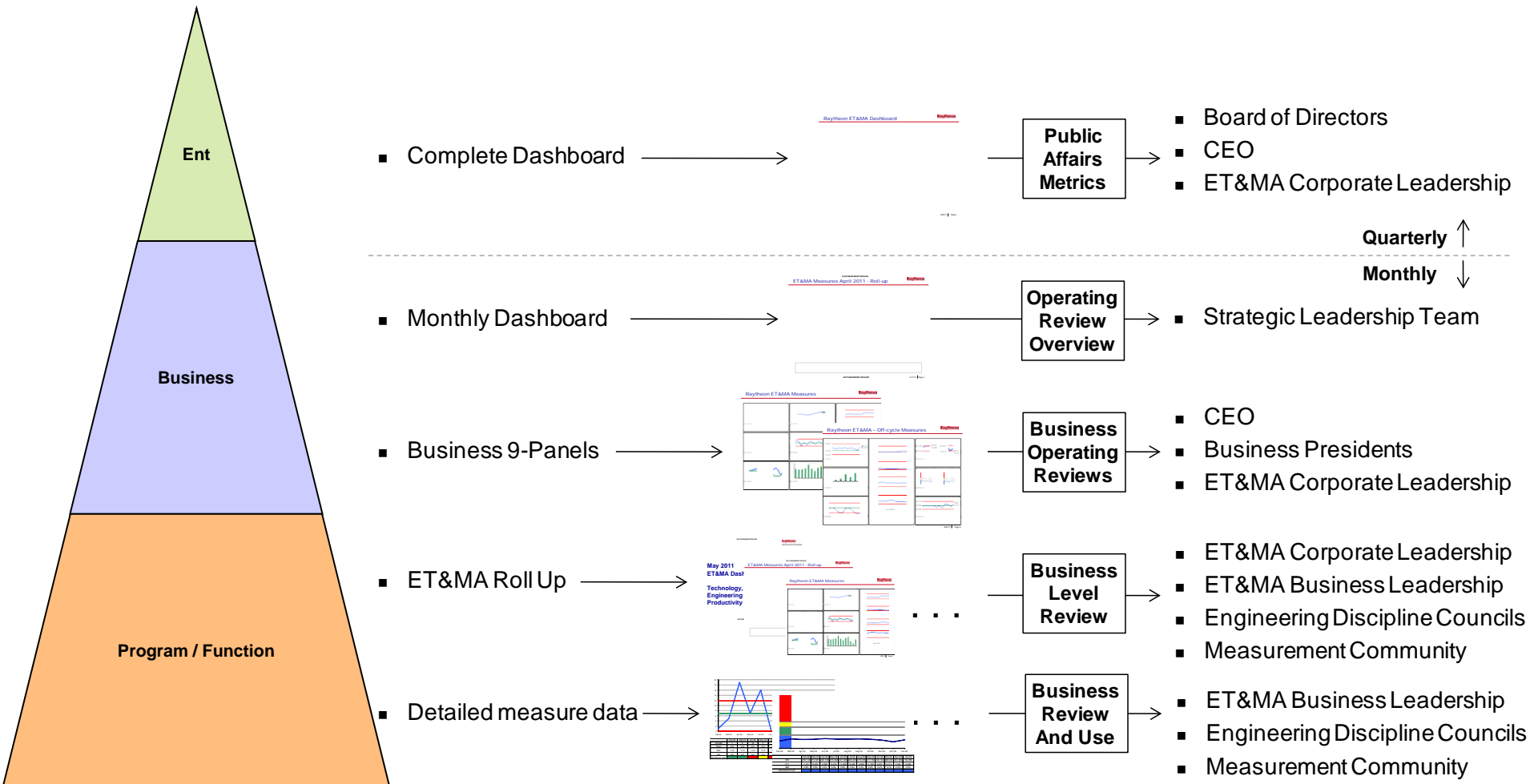
- Now able to effectively address:
 - Evolution / maturing of infrastructure
 - Measure analysis
 - Engineering discipline councils
 - Presentation layer sophistication
 - Continuous personnel change
 - Measurement community
 - Mid-lower level management and data owners/providers
 - Executive level
 - New challenges
 - Better, faster, smarter
 - Broader scope organizational initiatives
 - New measures – owner / analysis

2009

2011

Maturity Brings Different Challenges

Measurement Space Organizational Breadth and Depth



Source Data and Systems



Challenges



Speaking the Same Language



Establish the Decryption Key



Enablers



Make it Easy to Succeed

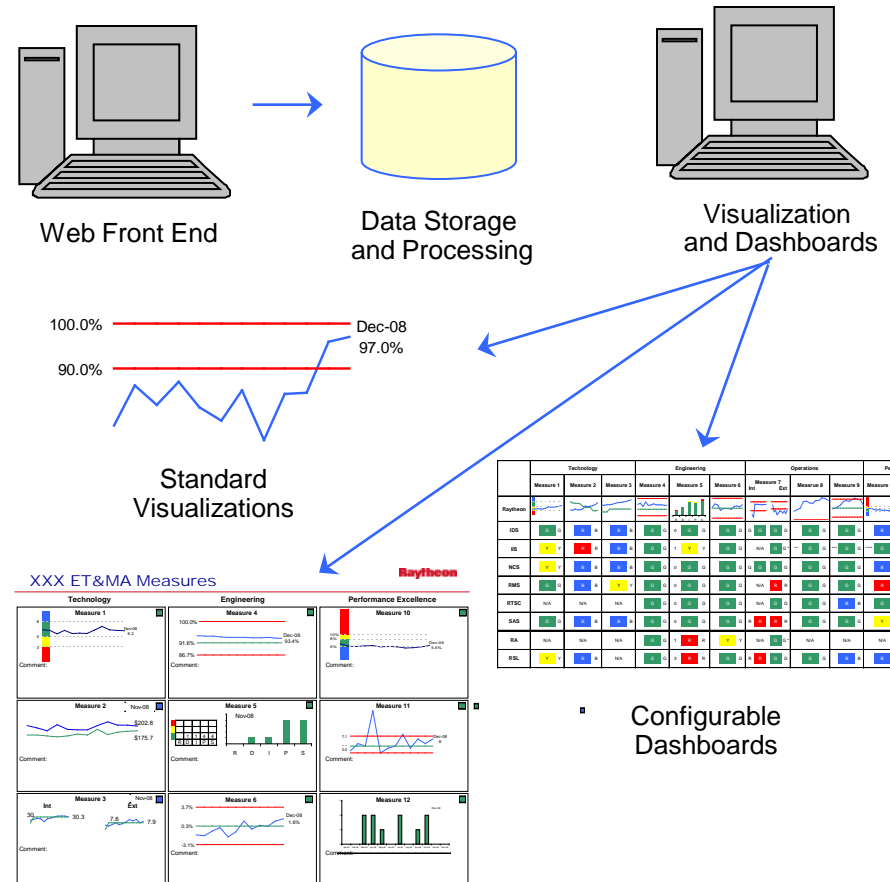
Provide the tools for success

■ Infrastructure

- Templates
- Web forms
- Reports

■ Command media

- Definitions
- Work flow / approvals / release
- Ownership
- Process



Standard Entry and Reporting

Enablers Should Help People and Give What You Need



Enablers



Ensure Health of the System

Provide the tools for success

- Plan for deployment
 - Each part of the business may have different issues
- Engage measurement community
 - Measurement Community of Practice (MCOP)
 - Extended community
- Establish a measure pipeline
 - Engage leadership
 - Define measure lifecycle
 - Plan for measure retirement

MCOP Charter

The MCOP Team, partnering with business Leadership, is responsible for the development, establishment, and execution of a high-maturity, industry-leading common measurement strategies enabling improved bottom line performance for Raytheon and Customer. This will be accomplished by:

- Defining, deploying, and evolving company level measures for roll-up and analysis by business and executive leadership
- Creating a measurement communications network
- Building a data savvy culture across Raytheon
- Supporting company and business level leadership team's measurement initiatives
- Fostering a continuous improvement culture based on measurement
- Analyzing and sharing core measurement data across businesses
- Recommending company wide measures to the Engineering and Technology, Operations, Performance Excellence Councils

4 - 2007 MCOP Charter - 4/5/07

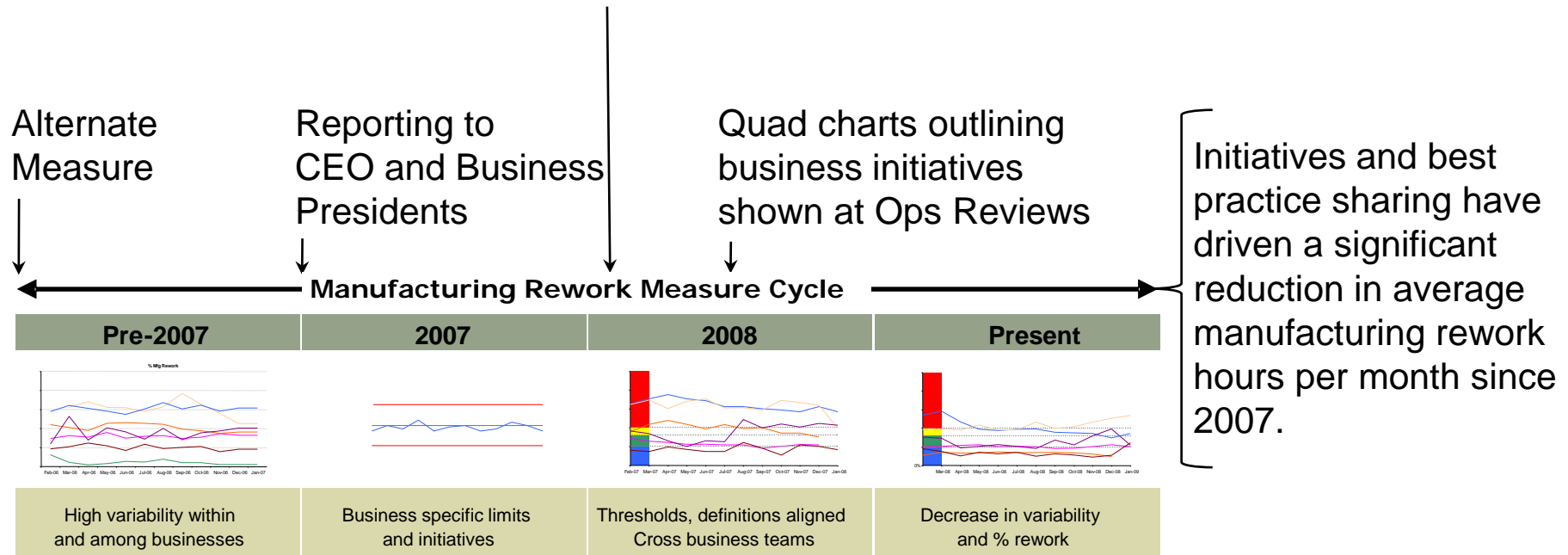
Need Champions Across the Organization



Results

- Representative example - Manufacturing rework – multi-year path

Launched a significant, cross-business best practice sharing and improvement initiative





Conclusions

Key elements to successfully establishing an enterprise measurement system:

- Be tough, stubborn, persistent
- Align your sponsorship continuously
- Enable people to succeed
- Build a flexible infrastructure
- Be a politician
- Be the expert and the leader

Biography

Jim Stubbe is a Senior Manager in Engineering at Raytheon Company and is serving at the company level as the Enterprise Measurement Lead for the Engineering, Technology, and Mission Assurance Organization.

Jim is also the lead for the Raytheon Measurement Community of Practice, a cross-Raytheon Engineering, Operations, Technology, and Mission Assurance measurement team.

Jim has been with Raytheon since 1989 and has served in a variety of line and technical leadership positions over that time within the Software and Systems engineering organizations.

Leading up to his current position, Jim was responsible for crafting and deploying the metrics infrastructure at the program and business level to support the successful appraisals for CMMI Levels 3 and 5.