Elements of Excellence
Managing With Analytics
Harnessing the Balanced Scorecard
(The Enterprise Performance Index)

Steve Arms
Director, QMS - Missile Defense LOB

Missiles and Fire Control
Element of Excellence - EPI

Enterprise Performance Index

• Business Scorecard Instrumentation
  – Flags Trends
  – Adaptable to Other Businesses
  – Complement to Tactical Techniques
• Discriminator in Industry
  – Strategic Instrumentation Set
  – Higher Understanding of Business Relationships
• Prediction Oriented Strategic Tool

Information for Executive Leaders to Drive Strategy and Results
The Journey: Tactical to Strategic Focus on Measures
Missiles and Fire Control

The Company Work System and Work Processes

Leadership Structure Mirrors Company Work Systems and Value Stream

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Metric Driven Results – Metric Alignment

Executive Review of Tiered Work Systems and Processes

- Tier 1: Work Process
  - Fabricate the Product
  - Capture the Business
  - Plan the Program
  - Etc.

- Tier 2: Work Process Multiple Measures
  - Hours Per Unit All Products
  - Defects Per Unit All Products
  - Etc.

- Tier 3: Work Process Measure
  - Hours Per Unit Product X
  - Defects Per Unit Product Y
  - Etc.

- Tier 4/5: PMT Team Measures
  - Hours Assembly Line A
  - Rejects Assembly Line B
  - Etc.

Team and Product Level Reviews

Executive Leadership Council

Quarterly

Bottom to Top Alignment

LMMFC
Robust Business Rhythm And Tiered Focus Achieves Results

- Business Rhythm
  - Product Teams: Daily / Weekly
  - Executive Leadership Council: Monthly
  - Senior Executive Leadership Council: Quarterly

- Tactical and Strategic Reviews

**Next Generation: Strategic Analysis of Work System Performance and Trending**

**Lockheed Martin Missiles and Fire Control Tier I Metrics Summary**

Capture the Business  |  Design the Product  |  Acquire Product Materials  |  Fabricate the Product  |  Support the Product  |  Finances  |  Employees  |  Facilities  |  Quality
---|---|---|---|---|---|---|---|---
M1.0.2  |  M2.0.1  |  M3.0.1  |  M4.0.1  |  M5.0.1  |  M6.0.1  |  M7.0.1  |  M8.0.1  |  M9.0.1
Competitive Win Rate  |  Critical Tasks  |  Material Shortages Cat 1  |  Contract On-Time Delivery  |  Mission Success  |  Program Performance  |  Turnover Rate  |  % Variance to Budget  |  Shop Reques Supplier Product
M2.0.2  |  M3.0.2  |  M4.0.2  |  M5.0.2  |  M6.0.2  |  M7.0.2  |  M8.0.2  |  M9.0.2
Design Stability  |  Supplier Performance - Contract Impact  |  Mtg. - Losses  |  Target Setting  |  Training & Development  |  LOB Defects Per Unit  |  Award Fee Percentage  |  Aging Tags > 90 Days
M3.0.3  |  M4.0.3  |  M5.0.3  |  M6.0.3  |  M7.0.3  |  M8.0.3  |  M9.0.3
Design Maturity  |  Supplier Performance - Program Impact  |  Off-Load (120 Days)  |  Award Fee Percentage  |  Program Maturity
M2.0.4  |  M3.0.4  |  M4.0.4  |  M5.0.4  |  M6.0.4  |  M7.0.4  |  M8.0.4  |  M9.0.4
Supplier Engineering Maturity  |  Supplier Reliability  |  On-Time Deliveries  |  Performance
M2.0.5  |  M3.0.5  |  M4.0.5  |  M5.0.5  |  M6.0.5  |  M7.0.5  |  M8.0.5  |  M9.0.5
Risk Mitigation Performance  |  Approved Procurement System  |  On-Time Deliveries  |  Performance
M2.0.6  |  M3.0.6  |  M4.0.6  |  M5.0.6  |  M6.0.6  |  M7.0.6  |  M8.0.6  |  M9.0.6
Staffing  |  Diversity Performance  |  On-Time Deliveries  |  Performance
M2.0.7

Malcolm Baldrige National Quality Award
2012 Award Recipient

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Realized Results – A Marriage of Instrumentation and Leadership

Plan → Capture → Execute → Support

Develop Strategic Objective → Develop Long Range Plan → Allocate Resources → Capture The Business

Rigorous Management Process Produces Sustained Market Growth

Achieved 106% 10-Year Average Performance to Plan Despite Significant Marketplace Volatility

Exceeded Orders Plans in Volatile Market
Realized Results – A Marriage of Instrumentation and Leadership

100% First Test Design Success Over 12+ Years

Cumulative Cost Savings Due to Robust Design Process and Resulting First Test Success

- 100% First Test Success
- 30% Cycle Time Reduction
- 103 Consecutive First Test Successes To Date

Plan the Program | Design the Product | Acquire the Product | Fabricate the Product | Support the Product

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Realized Results – A Marriage of Instrumentation and Leadership

Plan, Capture, Execute, Support

- Plan the Program
- Design the Product
- Acquire the Product
- Fabricate the Product
- Support the Product

Improvements in Managing/Developing Our Supply Chain Processes are Driving Operational Effectiveness

Benchmark top performer = 98%
Benchmark Average = 87%
Parts Procured

Strategic Improvements:
- Common Processes Evaluated Metric Set
- Enhanced Trend Tool
- Reverse Report Card Financial Risk Monitoring
- Supplier Improvement Conference Red Flag Review EPRI
- Supplier PMT Performance Reviews
- Sub-Tier Monitoring SHAPE, SCORE Disaster Warnings
- Supplier Data Gateway
- Supplier Tech Support Staffs
- Trend Tool Action Teams

On Time Percentage

- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

Supplier Parts Delivered

World Class Supply Chain Performance While Increasing Procured Volume

World Class Supply Chain Performance While Increasing Procured Volume

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Realized Results – A Marriage of Instrumentation and Leadership

Affordability Through Continuous Learning & Improvement

Identification of Opportunities Increase to Maintain Steady Cost Improvement
Return On Investment Substantially Exceeds Industry Benchmarks
Effective Metric Instrumentation and Leadership Enable Informed Decisions Throughout All of the Work Systems and Work Processes

Positive Customer Satisfaction Yields Increased Follow-On Business

Customer Satisfaction Improving With Orders and Financial Growth
EPI Strategic Metric System - Hierarchy

Enterprise Score: 736 + 72 = 834

Enterprise Score:
- Poor
- Marginal
- Acceptable
- Exceptional
- Over Managed

Talent Readiness Index (+/- 100 Pts):
+72

Talent Readiness Index:
- Poor Marginal
- Acceptable
- Exceptional
- Over Managed

Monitors Product, Process and Human Capital Performance

Product Index Scorecard: 738

Process Index Scorecard: 798

Composite Score: 60% 762 40%
EPI Strategic Metric System - Hierarchy

Process Index Scorecard

Scorecard Comprised of The Resultant Scores for Each Major Work System Including Key Support Functions

Fabricate the Product

Tier 3

Scorecard Comprised of the Key Indicators of A Work Process

Hours Per Unit Index

Tier 4

Scorecard For a Group of Work Process Measures

Hours Per Unit Program A

Tier 5

Work Process Measure

Each Tier Two Index Matches A Value Stream and An Executive Leader
1. Identify the Key Work Process Being Measured
2. Identify the Work Process Key Measure
3. Identify A Scale Which Captures The Expected Range of Performance
   • Spread the Scale from Poor Performance (100) to Perfection (1000).
   • Where Possible Use Normalized Indicators
   • Scales Do Not Have To Be Linear
4. Identify A Relative Importance or Weight For Each Metric
   • Base Off Long Range Plan and Strategic Importance to Business Future
5. Record and Plot Actual Values
6. Identify the Raw Value’s Level Based on Its Corresponding Scale
7. Multiply the Level and Weight to Get a Relative Score for Each Measure
8. Sum the Scores To Obtain an Index Score for The Key Measure

A Structured Scorecard to Align, Rank and Roll Up Metric Performance for Rapid Consumption
## Missiles and Fire Control

### EPI Strategic Metric System - Mechanics

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### Scores Roll Up Into Parent Indices

Approved for Public Release DAL201302014

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MFC Excellence - 16
EPI Strategic Metric System – Statistical Flagging

Flag Excessive Variation:
- Identify Non-Robust Processes
- Identify Extreme Situations

Flag Trending:
- Identify Turns In The Data To Drive Tactical and Strategic Shifts
- Get Ahead Of Or Leverage Drastic Change

Flag Poor Performance:
- Flag All Processes With Sub-Par Performance
- Drive Strategic Shifts

Scores Flagged To Identify Items Of Interest
**EPI Strategic Metric System – Correlation / Prediction**

**Plan**
- Develop Strategic Objective
- Develop Long Range Plan
- Allocate Resources
- Capture the Business

**Capture**
- Plan the Program
- Design the Product
- Acquire the Product
- Fabricate the Product

**Execute**
- Parts Purchased Inside of Lead Time
- Extensive Rework of Parts Required for Supplier Issues and Product Delays

**Support**
- Ensure Quality Excellence
- Provide Finance and IT Support
- Provide Facilities and ESH Support
- Provide Human Resources Support
- Provide Legal and Security Support

- **Supplier Parts Exhibit Increased Reject Rates**
- **Product Financial Performance Begins to Sway Due To Increased Rework of Supplied Hardware**

- **• Utilize Raw Values To Perform Regressions**
- **• Identify Dependencies in Work Systems and Work Process Relationships**
- **• Establish Time Phasing of Upstream Process and Performance Impacts to **Predict Impact**
- **• Evaluate Effectiveness of Strategy Changes**
- **• Calculate Control Sensitivity of Process**
- **• Identify Processes Needing Better Controls / Design**

**Correlation Can Lead To Time Phased Prediction of Upstream Results**
EPI Strategic Metric System – Best Practices

- **Identify Stakeholders for Your Work Systems and Processes**
  - Drive Ownership to Metrics
  - Drive Ownership to RESULTS

- **Have Stakeholders Identify 5-6 Key Work Process Metrics**
  - Focus On Normalized Metrics

- **Identify Meaningful Scales**
  - Ensure Scale Reflects Reality
  - Scale Should Drive Metric Toward Perfection (1000 Score)

- **Weight Metrics and Work Processes Based On Their Importance to the Company’s Long Range and Strategic Plans**

- **Adopt a Frequent and Meaningful Business Rhythm**

- **Adopt Meaningful and Challenging Goals**

- **Set Strategic and Tactical Direction**

**Your Company Can Utilize Analytics To Help Drive Strategy And Results**
Final Thoughts – EPI And Malcolm Baldrige

• Malcolm Baldrige Model provides the framework
  – Measurement of the system that includes focus on Leadership, Planning, Workforce, Operations, with Results to the Customer

• Balanced Scorecards provide the Measurement Methodology
  – Identifies the measures and goals for each Key Work Process
  – Identifies Ownership and Accountability

• Enterprise Performance Index provides the Strategic Analysis
  – Analyzes the Work Systems with the focus on the Business Long Range Plan
  – Provides the Knowledge to predict and identify trends early to drive Results

MFC Fundamental Business Principle:
Business is not the objective … it is the result. Performance is our objective.