Welcome to ARINC!!

Baltimore ASQ
Making Measurement (More) Meaningful

Presented by:
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October 20, 2005
Agenda

• A little on ARINC
• Why Measure?
• Our customers
• Measurements we make for them
• Taking Measurement further
• Value Measurement
ARINC

ARINC serves the airline, defense, and commercial industry with numerous world-wide communications services, using VHF, HF, and Satellite, along with various broadband and network capabilities.

The Quality Analysis Section of QMO at ARINC monitors and reports on the performance and availability of all of these services.
Why Measure? (The Basics)

• Socrates once said, “That for which you cannot measure, you cannot show quality”.
• An ASQ member said, “We don’t measure to make your product, we measure to make your product… better”

• Tells you and the customer how good the product/service is; in other words, “Quality”
• It helps sell your product to….

• External customers
• Internal customers
Measurement for External Customers

- What are their requirements?
Design measures around their requirements.
  - What is the data needed?
  - How do you get the data for the measures?
  - Is the data reliable?
  - Critical requirements: Are there penalties if you fail to meet the requirements?
Measurement for Internal Customers

• Who are these customers? Executives Your boss Project Managers

• How do their requirements differ from external customers?
  – Do you have Corporate Goals?
  – Do you have Department Goals?
  – What are your personal goals?
Taking Measurement Further

• What can you do to make these measures more meaningful to the customer?

Data Trends – Verbally summarize for the customer

Americas TRAFFIC: 24,800,000 messages for the month of September.

ACARS Average daily traffic was recorded at 800,000 messages per day:
(based on a 31 day billing cycle)

8.21% decrease over August 2005
5.79% increase over September 2004

Four of the four performance measurements met the goal for the month. Four of the four performance measurements met the goal YTD.

Four of the four availability measurements were met for the month. Four of the four availability measurements were met for the YTD.
Taking Measurement Further

• What can you do to make these measures more meaningful to the customer?

Data Trends – Table summarizes for the customer

<table>
<thead>
<tr>
<th>PERFORMANCE MEASUREMENTS</th>
<th>2004</th>
<th>2005</th>
<th>2005</th>
<th>GOAL</th>
<th>MONTHLY</th>
<th>GOAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uplink Message Delivery Success</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rate (%) – All Deliverable Messages</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>99.950</td>
<td>NA</td>
<td>99.960</td>
<td>Y</td>
<td>99.990</td>
<td>Y</td>
</tr>
<tr>
<td>- POA Uplink Deliverable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messages</td>
<td>99.953</td>
<td>NA</td>
<td>99.950</td>
<td>Y</td>
<td>99.470</td>
<td>Y</td>
</tr>
<tr>
<td>- AOA Uplink Deliverable</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messages</td>
<td>99.990</td>
<td>NA</td>
<td>99.989</td>
<td>Y</td>
<td>99.875</td>
<td>Y</td>
</tr>
</tbody>
</table>
Taking Measurement Further

• What can you do to make these measures more meaningful to the customer?

Data Trends – Show the customer
Misleading Measures

• Percentage increases can distort
  – If an investment gains 44% while the S&P gains 30%, you beat the market by 14%.
  – But you also can say you beat the market by 44%, as \( \frac{14}{30} = 44\% \).

• Round off differences
  – In the US, there may be 3 g of fiber in a cereal box, but in Canada there is only 2.7 g in the same box, a difference of 10%.
Value Measurement
Proprietary ARINC

Define

Analyze

Control

Measure

Must be provable

Easy to measure

Improve

Show before and after

Has to be believable

DMAIC

Proprietary ARINC
Calculating Value (Savings)

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Origin</th>
<th>Date</th>
<th>Problem</th>
<th>Root Cause</th>
<th>Improvement</th>
<th>Est'd Hrs saved (mth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Automation of Quarterly report</td>
<td>Name</td>
<td>3/5/2005</td>
<td>No automatic process</td>
<td>Too many different processes</td>
<td>Created Master Excel SS for all reports, standardized format of report. Reduced time to do report from 3/4 day to 1/3 day. Savings estimate based on report volume of 20 -22, thus going from 15-16 days (2/4 * 20 to 22) to 7 (1/3 * 20 to 22) to generate all reports. This saves about 9 days per quarter or about 3 per month.</td>
<td>24</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.</th>
<th>Saved Hours/mth</th>
<th>Burdened labor</th>
<th>Savings/mth</th>
<th>Yearly Savings</th>
<th>Original Cost</th>
<th>Yrly maint</th>
<th>Net cost/yr</th>
<th>PV of Cost</th>
<th>PV of Savings</th>
<th>NPV less all cost</th>
<th>Return over 5 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>24</td>
<td>75</td>
<td>$ 1,800</td>
<td>$ 21,600</td>
<td>$ 14,500</td>
<td>$ 600</td>
<td>$ 600</td>
<td>$ 2,783</td>
<td>$ 117,007</td>
<td>$ 99,724</td>
<td>7.1</td>
</tr>
</tbody>
</table>

|   | Automation of Station Reporting | Name    | 4/11/2005 | Analyst could not monitor daily outages adequately | No automation program existed | 15 |

| 3 | Purchase of new servers to allow more information to be stored, manipulated, and generated | DBA | 6/27/2005 | Servers at capacity | Amount of data being stored growing on a daily basis | 34 |

Proprietary ARINC
### Estimated Cost Savings Due to Improvements

<table>
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<tr>
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<td>$117,007</td>
<td>$99,724</td>
<td>7:1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>15</td>
<td>90</td>
<td>$1,440</td>
<td>$17,200</td>
<td>$14,700</td>
<td>$240</td>
<td>$240</td>
<td>$1,113</td>
<td>$93,606</td>
<td>$77,792</td>
<td>6:1</td>
<td>1</td>
</tr>
<tr>
<td>3*</td>
<td>34</td>
<td>85</td>
<td>$2,690</td>
<td>$34,680</td>
<td>$25,500</td>
<td>$600</td>
<td>$600</td>
<td>$2,783</td>
<td>$187,861</td>
<td>$159,573</td>
<td>8:1</td>
<td>1</td>
</tr>
</tbody>
</table>

**Totals**: 74  
$6,130 $73,560 $54,700 $1,440 $1,440 $6,279 $398,474 $337,095 7:1

**Average annual savings**: $67,419
Measurements are Meaningful!!