Overview of Leading Indicator Research and Usage

July 24, 2012

Desired Outcome from Research

- Practically applied leading indicators
  - Applied by leadership to DRIVE OE / HSE performance results
  - Used to enable iterative continuous improvement process
- Criteria for “management” control
  - Routinely measurable
  - Practically actionable
  - Objective
  - Normalized
  - Predictive

Model: “FICO”
Data-driven Leading Indicator Research

- 4-year multi-company study
- Data set → millions of assessments, observations, surveys, audits, near misses, investigations, action items...

Research: Answer the Question...

What are the actionable, measurable differences that LEAD to below results?

Sustaining NEAR zero...

Worst Performing Assets

Orders of magnitude WORSE!

Data from Routine Process Execution

Routine Activities
- Recordable injuries
- First aid injuries
- Near misses
- Supervisor walk-around
- Behavioral observation
- Safety issue suggestion
- Hazard ID’s
- Management of change
- Process hazard analysis
- Mgmt system assessment
- Formal risk assessment
- Task risk assessment
- Job hazard analysis
- The list goes on and on...

Organizational Process

- Analytical process -- DMAIC
  - Define → started with over 200 leading metric definitions
  - Measure → applied factor / regression analysis to reduce to most meaningful list of ~ 70 metrics
  - Analyze → multi-component index most predictive of performance + practical as mgmt control
Results: A Measurable Solution

Best performing organizations have...

X1: Reporting Culture: Strong culture of reporting and fixing AND
X2: Action Execution: High rate of action with timely execution AND
X3: Leadership Responsiveness: Responsive, disciplined involvement

Predictive Index = F (X₁, X₂, X₃)

The Practical Application

<table>
<thead>
<tr>
<th>Practical Field-level Metrics</th>
<th>Preventive Index KPI Dashboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed KPI Scorecard</td>
<td>Executive Analyst (Q1/Q2)</td>
</tr>
<tr>
<td>Loss Event Rate</td>
<td>IMPACT Index</td>
</tr>
<tr>
<td>Event Fix Ratio</td>
<td>Report Culture</td>
</tr>
<tr>
<td>% On Time Actions</td>
<td>Action Execution</td>
</tr>
<tr>
<td>Site 1 2.56</td>
<td>8.79</td>
</tr>
<tr>
<td>Site 2 3.30</td>
<td>6.75</td>
</tr>
<tr>
<td>Site 3 3.70</td>
<td>2.49</td>
</tr>
<tr>
<td>Site 4 1.30</td>
<td>7.62</td>
</tr>
<tr>
<td>Site 5 0.85</td>
<td>9.55</td>
</tr>
<tr>
<td>Site 6 0.80</td>
<td>7.95</td>
</tr>
</tbody>
</table>

Managed KPIs:
- Site 1: 2.56, Event Fix: 2.49, % On Time: 97%
- Site 2: 3.30, Event Fix: 4.89, % On Time: 97%
- Site 3: 3.70, Event Fix: 7.00, % On Time: 97%
- Site 4: 1.30, Event Fix: 7.62, % On Time: 97%
- Site 5: 0.85, Event Fix: 9.55, % On Time: 97%
- Site 6: 0.80, Event Fix: 7.95, % On Time: 97%

Managed KPIs:
- Site 1: 2.56, Event Fix: 2.49, % On Time: 97%
- Site 2: 3.30, Event Fix: 4.89, % On Time: 97%
- Site 3: 3.70, Event Fix: 7.00, % On Time: 97%
- Site 4: 1.30, Event Fix: 7.62, % On Time: 97%
- Site 5: 0.85, Event Fix: 9.55, % On Time: 97%
- Site 6: 0.80, Event Fix: 7.95, % On Time: 97%

Owned by Line Managers
- choose short list of “stewarded” KPI’s
- practical, relevant to management
- calculated / monitored on monthly basis
- accountability cascaded throughout operations leadership

Governed by Steering Committee
- reviewed only by exec steer committee
- looking for interesting trends
- calculated / monitored on quarterly basis
- consideration as future “managed” KPI’s
- iterate / review benchmarks / evolve KPI’s...

MONTHLY in the field. QUARTERLY in executive offices.

*** The Key to Buy-in: Operative-value aligned
Thanks…