Project Management Metrics, KPIs and Dashboards

By
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PART 1

THE DRIVING FORCES
FOR MORE METRICS
Definition of Project Success Using Metrics

How many puzzle pieces are needed to understand The real status and define success?
The true status of the project cannot be determined from just the time and cost metrics. Other metrics are needed.
The Need for Additional Metrics

Without reliable metrics, performance reporting is like rolling the dice.
There are no genies or magic lamps to assist us in determining the status. It will require a change from the way we managed in the past.
Effective data mining will be necessary to determine the correct set of metrics for each project.
Project Management Core (Health) Metrics

- Time
- Cost
- Resources
- Scope
- Quality
- Actions

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Not everything that counts can be counted. Not everything that can be counted counts.
Metric Naysayers

The use of metrics requires change and people tend to dislike change. The results are arguments such as:

- Metrics are an expensive and useless measurement
- Metrics are costly to maintain and the benefits do not justify the cost
- Metric measurements are a waste of productive time
How Employees View Metrics

- Employees will not support a metrics management effort that looks like a spying machine. Some people are very touchy about their performance being measured.

- Metrics are for monitoring project performance and should not be used as a basis for punishment.
PART 2

UNDERSTANDING KEY PERFORMANCE INDICATORS
Although most companies use metrics for measurement, they seem to have a poor understanding of what constitutes a KPI, especially for projects.
Dissecting The KPI

- **Key** = a major contributor to success or failure
- **Performance** = measurable, quantifiable, adjustable and controllable elements
- **Indicator** = reasonable representation of present and future performance
Another Way to Define a KPI

KPIs can be selected using the following:

- **Predictive:** able to predict the future of this trend
- **Measurable:** can be expressed quantitatively or qualitatively
- **Actionable:** triggers changes that may be necessary
- **Relevant:** the KPI is directly related to the success or failure of the project
- **Automated:** automated reporting minimizes the chance of human error
- **Few in number:** only what is necessary
PART 3

METRIC TARGETS
Traditional Targets

- 1 Ounce of Liquor
- 5 Ounces of Wine
- 12 Ounces of Beer
The KPI Boundary Box

Upper Performance Target Limit for the KPI

KPI Performance Targets

Lower Performance Target Limit for the KPI
Boundary Box Integrity (Tolerances)

Ask the stakeholders how much integrity is acceptable:

- Is the target ± 5% acceptable?
- Is the target ± 10% acceptable?
- Are integrity guidelines established in the project’s business case?
- Are integrity guidelines established as part of the EPM system?
PART 4

METRIC MEASUREMENTS
If it cannot be measured, then it cannot be managed.
Reporting metrics requires measurements. Metrics management programs force us to become better at metric measurement techniques.
Some Metric Measurement Techniques

- Observations
- Ordinal (i.e., four or five stars) and nominal (i.e., male or female) data tables
- Ranges/sets of value
- Simulation
- Statistics
- Calibration estimates and confidence limits
- Decision models (i.e., EV, EVPI, etc.)
- Sampling techniques
- Decomposition techniques
- Human judgment
- Rules (i.e., 50/50, 80/20, 0/100, % complete, etc...)
Intangible goals may be tough to measure, but they are not immeasurable. Tough things to measure include:

<table>
<thead>
<tr>
<th>Collaboration</th>
<th>Image/Reputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment</td>
<td>Leadership Effectiveness</td>
</tr>
<tr>
<td>Creativity</td>
<td>Motivation</td>
</tr>
<tr>
<td>Culture</td>
<td>Quality of Life</td>
</tr>
<tr>
<td>Customer Satisfaction</td>
<td>Stress level</td>
</tr>
<tr>
<td>Emotional Maturity</td>
<td>Sustainability</td>
</tr>
<tr>
<td>Employee Morale</td>
<td>Teamwork</td>
</tr>
</tbody>
</table>
PART 5

VALUE-BASED OR VALUE-REFLECTIVE METRICS
The Metric/KPI Target Boundary Box

**Performance Integrity**

- **Target + 20%**
  - Very Favorably Exceeding Target
  - Superior

- **Target + 10%**
  - Exceeding Target
  - Good

- **Target - 10%**
  - Performance Target
  - Normal

- **Target - 20%**
  - Unfavorable Expectation
  - Caution

  - Risk of Project Failure
  - Urgent Attention
## Value Points for the Target Boundary Box

<table>
<thead>
<tr>
<th>Performance Characteristics</th>
<th>Value Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superior</td>
<td>4</td>
</tr>
<tr>
<td>Good</td>
<td>3</td>
</tr>
<tr>
<td>Normal</td>
<td>2</td>
</tr>
<tr>
<td>Caution</td>
<td>1</td>
</tr>
<tr>
<td>Urgent Attention</td>
<td>0</td>
</tr>
</tbody>
</table>

### Exceeding Target
- Very Favorably Exceeding Target
- Exceeding Target

### Performance Target
- Performance Target

### Unfavorable Expectation
- Unfavorable Expectation

### Risk of Project Failure
- Risk of Project Failure
## Value Metric Measurement

<table>
<thead>
<tr>
<th>Value Component</th>
<th>Weighting Factor</th>
<th>Value Measurement</th>
<th>Value Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality</td>
<td>10%</td>
<td>3</td>
<td>0.3</td>
</tr>
<tr>
<td>Cost</td>
<td>20%</td>
<td>2</td>
<td>0.4</td>
</tr>
<tr>
<td>Safety</td>
<td>20%</td>
<td>4</td>
<td>0.8</td>
</tr>
<tr>
<td>Features</td>
<td>30%</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>Schedule</td>
<td>20%</td>
<td>3</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Total = 2.7
Metric: Project Value Attributes

April Measurements

<table>
<thead>
<tr>
<th>Value Attribute</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule</td>
<td>4</td>
</tr>
<tr>
<td>Features</td>
<td>3</td>
</tr>
<tr>
<td>Safety</td>
<td>3</td>
</tr>
<tr>
<td>Cost</td>
<td>2</td>
</tr>
<tr>
<td>Quality</td>
<td>4</td>
</tr>
</tbody>
</table>

Rating Legend
- 4 = Superior
- 3 = Good
- 2 = Normal
- 1 = Caution
- 0 = Attention

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Purpose of a Dashboard

- The purpose of a dashboard is to convert raw data into meaningful information that can be easily understood and used for informed decision making.

- The dashboard provides the viewer with "situational awareness" of what the information means now and what it might mean in the future.
Dashboard Design and Layout

Some rules exist for dashboard design and layout:

- Rules for selecting the right artwork
- Rules for screen real estate
- Rules for artwork placement
- Rules for color selection
- Rules for accuracy of information (2D vs. 3D)
- Rules for aesthetics
PART 7

GRAPHICAL DISPLAYS OF METRICS AND KPIS
**Metric: Management Reserve**

- **Jan**: 100
- **Feb**: 70
- **Mar**: 40
- **Apr**: 50

Available (green) and Used (blue) management reserve across different months.
Metric: Quality of Assigned Labor

Number of People

Jan | Feb | Mar | Apr
---|---|---|---
2  | 2  | 3  | 3  
4  | 5  | 5  | 3  

- Green: Grade 8
- Blue: Grade 7
- Orange: Grade 6

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Metric: Total Project Manpower

- **Jan**: 20 Contracted, 30 Hourly, 15 Salaried, Total 65
- **Feb**: 20 Contracted, 30 Hourly, 15 Salaried, Total 65
- **Mar**: 20 Contracted, 45 Hourly, 10 Salaried, Total 75
- **Apr**: 20 Contracted, 35 Hourly, 7 Salaried, Total 62

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Metric: Regular Time, Overtime and Unstaffed Hours

- **Regular Time Hours**
- **Overtime Hours**
- **Unstaffed Hours**
Metric: Deliverables On Time or Late

<table>
<thead>
<tr>
<th>Month</th>
<th>On Time</th>
<th>Late</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Feb</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>Mar</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Apr</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

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Metric: Deliverables Accepted or Rejected

Number of Deliverables

<table>
<thead>
<tr>
<th>Month</th>
<th>Accepted</th>
<th>Rejected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Feb</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Mar</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Apr</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

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Metric: Scope Changes Approved, Denied and Pending

Note: This metric can show the rate of change in the requirements (i.e., requirements growth over time).
Metric: Number of Baseline Revisions

<table>
<thead>
<tr>
<th>Month</th>
<th>Time</th>
<th>Cost</th>
<th>Scope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Feb</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Mar</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Apr</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Metric: Open Action Items

Number of Action Items

- **Apr**
  - Three Months or Longer: 1
  - Two Months: 2
  - One Month: 0

- **Mar**
  - Three Months or Longer: 2
  - Two Months: 1
  - One Month: 0

- **Feb**
  - Three Months or Longer: 1
  - Two Months: 2
  - One Month: 0

- **Jan**
  - Three Months or Longer: 0
  - Two Months: 1
  - One Month: 2

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Metric: Project Complexity (Risk) Factor

April’s Results

<table>
<thead>
<tr>
<th>Complexity Factor</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical</td>
<td>3</td>
</tr>
<tr>
<td>Business</td>
<td>2</td>
</tr>
<tr>
<td>Delivery</td>
<td>2</td>
</tr>
</tbody>
</table>

Table Legend
5 = Very High
4 = High
3 = Moderate
2 = Low
1 = Very Low
Metric Library: Project Complexity (Risk) Factor

<table>
<thead>
<tr>
<th>Factor</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Shows Changes in Project Complexity Over Time</td>
</tr>
<tr>
<td>Metric Owner</td>
<td>Ellen Stanford</td>
</tr>
<tr>
<td>Advantages</td>
<td>Directly Related to Downstream Risks</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>Highly Subjective</td>
</tr>
<tr>
<td>Metric or KPI</td>
<td>Metric</td>
</tr>
<tr>
<td>Value Attribute</td>
<td>Not Applicable</td>
</tr>
<tr>
<td>Type of Image</td>
<td>Stacked Column</td>
</tr>
<tr>
<td>Measurement</td>
<td>Human Judgment</td>
</tr>
<tr>
<td>PMBOK® AOK</td>
<td>Risk Management</td>
</tr>
<tr>
<td>PMBOK® Domain</td>
<td>Execution</td>
</tr>
</tbody>
</table>

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PART 8
MISLEADING INDICATORS
The Danger of Misleading Indicators

Misleading indicators lead the viewers to either the wrong conclusions or to lose faith in the dashboard reports.
What’s Wrong With This Dashboard Image?

Dollars, in $10,000

<table>
<thead>
<tr>
<th>WP #1</th>
<th>WP #2</th>
<th>WP #3</th>
<th>WP #4</th>
<th>WP #5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>Overhead</td>
<td>Material</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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What’s Wrong With This Dashboard Image?

- **Dollars, x $10,000**
- **January**
- **February**
- **March**

**Bar Chart**
- **Budget**
- **Actual**
What’s Wrong With This Dashboard Image?

Cost Overrun

Cost Overrun (x $10,000)

WP #1  WP #2  WP #3  WP #4  WP #5  WP #6  WP #7  WP #8
What’s Wrong With This Dashboard Image?

- **Costs (x $10,000)**
- **Projects**:
  - Project #1
  - Project #2
  - Project #3
  - Project #4
- **Cost Categories**:
  - Labor
  - Overhead
  - Vendors
  - Materials

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What’s Wrong With This Dashboard Image?
Multi-Color Status Reporting

- Status not addressed or recorded
- Meeting expectations; on course
- Some improvements needed now
- Some improvements needed in the future
- Not meeting expectations; critical issues
- Problem exists and no action taken
- Exceeding expectations
- Completed
- Still active and completion date has passed

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### What’s Wrong With This Dashboard Image?

#### Cost Variances

<table>
<thead>
<tr>
<th>Work Package</th>
<th>Cost Variance</th>
<th>Emoticon</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3</td>
<td></td>
<td>😊</td>
</tr>
<tr>
<td>#4</td>
<td></td>
<td>😲</td>
</tr>
<tr>
<td>#7</td>
<td></td>
<td>😢</td>
</tr>
<tr>
<td>#8</td>
<td></td>
<td>😯</td>
</tr>
<tr>
<td>#9</td>
<td></td>
<td>😞</td>
</tr>
</tbody>
</table>
What’s Wrong With These Emoticon Images?

How would you interpret these dashboard emoticons?
PART 9

METRIC MANAGEMENT PROGRAMS
Building a metrics management program cannot be done overnight. Executive support is necessary from the start.
Executive support must be visible. Actions must support the words.
Role of the PMO

- The PMO must put the metrics program in place and maintain ownership.
- The PMO maintains responsibility for corporate-wide metrics education.
- There may be a metric owner for each metric.
- The PMO will conduct metrics benchmarking.
- It may be necessary to create a position of the Chief Performance Officer in the PMO.