The Monitoring and Early Warning Indicators for a software project

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A little bit about me

IFPUG
- Board of Directors
- Director of Certification
  - Past – Direction of Applied Programs
  - Past - Vice-chair of IT Performance Committee

Hewlett Packard Enterprise
- Process, Estimating & Measurement
- RCA on Cost Model – Budget and Tracking
To create a Budget without Monitoring and EWI is a bit like having a car without the wheels and ability to drive.

- When driving Monitor
  - Speed
  - Quality
  - Early Warnings Indicators
Root Cause Analysis for insufficient EWI & Monitoring

- No collection of actuals
  - Especially against the units used in estimates
- Only focus on what already has happened
- No Task’s Monitoring
- No tracking of Risk identified during estimates
- The expectation of Productivity
  - Suddenly the un-realistic estimates comes true
- Project Constrains impacting effort & cost
- Unexpected changes in influencing factors
- No shared repository for data collection and normalization
- No standard usage of tools and designs of reports
CIO perspective

Consequences for CIOs of inaccurate data in the last 12 months

- Lost revenue opportunities: 43%
- Customer experience/engagement is less than optimal: 42%
- Difficulty using data to drive strategic decision making: 33%

Key barriers preventing CIOs from using data assets effectively

- Limited budget: 51%
- Volume of data: 47%
- Lack of understanding about how to use analytics to improve the business: 47%

CIOs cited saving from investing in data quality tools over a 12 month period

- £100,000 - £249,999: 19%
- £250,000 - £499,999: 20%
- £500,000 - £1,000,000: 18%

Source: Experian Data Quality, Dawn of the CDO Research, 2014
Good Reporting:
• Covers all aspect & perspectives
• As few Reporting as possible
• All data natural output or input from process
• A simplification of the “real” world (but not to simplified)
The Balance & Requirements

Promote confidence, understanding, acceptance

Balance between many factors

- **Confidence**
  - Accurate
  - Achievable
  - Competitive

- **Understanding**
  - Easy overview
  - As simple as possible

- **Acceptance**
  - Informed EWI and Monitoring
  - Decision making EWI and Monitoring
  - Value for Effort/Money
  - Increase ability to meet goals
Data Collection
Main focus EWI, Monitoring & Benchmark

Data collection and usage - a simplification

Value
Benefits

Metrics
Delivery

Metrics
Tracking

Metrics
Value

Size
EWI/KPI

Cost
EWI/KPI

Price
EWI/KPI

Effort
EWI/KPI

Size

Effort

Staff

Price

Changes

Defects

Cost

# Examples of EWI

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
<th>Calculation</th>
<th>Cal. Description</th>
<th>Color status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitor Budget</td>
<td>CPI (Trend) over 3 Months</td>
<td>Last 3 months $\Delta$ CPI $\leq -0.05$ &amp; CPI $&lt; 0.8$</td>
<td>Last 3 months the CPI is red with a decreasing trend, having decreased last 3</td>
<td>Red. Last 3 months the CPI is red with a decreasing trend, having decreased last 3 months at least by 0.05</td>
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<tr>
<td></td>
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<td></td>
<td>months more or equal to 0.05 (half range to switch between colours)</td>
<td></td>
</tr>
<tr>
<td>Monitor Budget</td>
<td>CPI (Trend) over 3 Months</td>
<td>Last 3 months $\Delta$ CPI $&lt; 0$ &amp; $\geq -0.05$ &amp; current CPI$\geq 0.9$ &amp; $\leq 1.1$</td>
<td>CPI decreasing last 3 months at a small rate but still in good shape but with</td>
<td>Green. Last 3 months the CPI is decreasing by a value larger than 0 and less or equal to 0.05, while SPI remains green and is $\leq 1.1$</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>risk to move to yellow</td>
<td></td>
</tr>
<tr>
<td>Monitor Resources</td>
<td>Staff Variance</td>
<td>High Last 3 Months</td>
<td>Staff variance ranked from more than or equal to 20%, high -(either positive or</td>
<td>Calculation: $\left{\frac{\text{Actual Staff} - \text{Revised Baseline Staff}}{\text{Revised Baseline Staff}}\right} \times 100$ A. High. $&gt;</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>negative) last three consecutive periods</td>
<td></td>
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<tr>
<td>Monitor Effort</td>
<td>Estimated FTE Ratio</td>
<td>Variance against expected FTE ratio</td>
<td>Ration of Hrs against expected Hrs per FTE</td>
<td>(Estimated Hrs/FTE) vs 130 $&gt;\geq 1.1$ And $&lt;1.2$</td>
</tr>
<tr>
<td>Monitor Quality</td>
<td>Pre-Release Defect Reporting</td>
<td>Pre-Release defect collected, performed and reported</td>
<td>That Pre-Release defects is reported</td>
<td></td>
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<tr>
<td>Monitor Progress</td>
<td>Late Phase Start</td>
<td>That project is progressing as expected</td>
<td>To identify possible issues later in the project (Re-plan indicator)</td>
<td>Design Late Start</td>
</tr>
<tr>
<td>Monitor Scope</td>
<td>Scope Creep Mgt.</td>
<td>That Change Request impact scope</td>
<td>Identify against threshold of CR</td>
<td>Incorporated Requirement Change Since Last Estimate Date $&gt; =5$ and $&lt; 10$</td>
</tr>
<tr>
<td>Monitor Productivity</td>
<td>Estimated productivity FP per Person Month - Industry rating</td>
<td>That productivity is not optimistic</td>
<td>Estimated productivity is not higher than 30% above industry</td>
<td>$\text{FP} &gt; 0</td>
</tr>
</tbody>
</table>
How to get there – Monitoring and EWI

Goal, Question, Metric process - Iterative

Key stakeholders:
Management
Data experts
Measurement Experts
What is Size in a Monitoring and EWI

Issues: Poor or In-sufficient
- Collection of data
- Change Management Process
From Scope Black box to Quantitative measure

Quantitative Scope

- Scope to # of
- Sizing Standards
- Scope creep Monitoring
- Thresholds acceptable

Using Sizing Standards
IFPUG Function Point Analysis (FPA) - The Scope Process

Functional Size:
- Total “Lego” Size
- # of blocks and # Lego Studs
- # of Interfaces (EIF)
- # of Reports (EO, EQ)
And many more
The output - A Balance (Score Card) perspective

- A lot of reports
- Lots of data
- A lot of KPI’s
- A lot of information
- A lot of data’
- Usually no EWI’s

Ton’s of data & Reports…

Never used or looked at…

Tells only half of the truth..

Status without a reason …

Goal:
Decision, Informing, used & facts

- The right reports
- The right data
- The right KPI’s
- The right information
- The right data
- The ability to act before issues arrive
- EWI’s to identify where to act
Monitoring graphs

- One graph is not the truth!
- Maximize the different graphs
- Trend over time
- Graph perspective supports EWI
Parametric Monitoring

- Use the Parametric Monitoring for Monitoring and EWI.

_Gives you the power to…_

- Develop realistic, data-driven cost, effort and duration comparison
- Sanity check plans against your history and industry trends
- Scenarios to see impact of new changes, constraints and assumptions
What to do when you have the data - Cause Analysis Tools

Cause Analysis:
- Pareto Analysis
- 5 Whys
- Brainstorming
- Affinity Diagram
- Fishbone Diagram
Maximise it

Remember to:

- Identify what the goal of the monitoring and EWI is
- Use size measures to normalise monitoring and EWI
- Internal or external size definition
- Identify the critical reports - simplify
- Report with added value – not just one perspective
- Use EVM method against other than cost
- Do not stop at measurement and reporting – RCA
- Perform actions against metrics
**Final Statement**

Estimates and initial budget will change over time

Monitoring and EWI identify when actions should be taken

Aligning Monitoring and EWI performance with Goals of the Management

Increase benefit and awareness by ensuring easy to understand reports
Thanks for listening