Metrics Based Project Governance

Presented by: Pam Morris
TOTAL METRICS

ACOSM 2003

“Without objective data you are just another person with an opinion”
“harnessing the capabilities of your metrics team to minimise project risk”
Summary Slide

**Governance – “balancing risk against opportunity”**


- **Successful** - on time and on budget with all features and functions
- **Challenged** - over budget, over time, not all functions and features
- **Failed** - cancelled

Only 34% achieved Business Intent
Consequences of Failure

- Private / public embarrassment
- Missed business opportunities
- Disenchanted clients
- Legal repercussions
- De-moralised staff
August 1999 - INCIS - New Zealand Police System

“NZ Finance Minister confirmed that INCIS' cost to the taxpayer so far was $106 million. Others have estimated the cost at up to $130 million, but in any case, costs have run well beyond the $98 million police budgeted for the entire project in 1995”.

Computerworld - 10th August 1999

“the New Zealand police said to have made more than 900 variations to the original 10,000-page contract and IBM saying it had already lost $40 million on the ill-fated application”

The Age 24 June 2003
Feb 2001 - Citylink – Melbourne’s Tolling and Tunnel System

- “Trouble is, it's been plagued with problems from the first sod - delays technical problems with computer tolling systems” 7:30 Report 22nd Feb 2001

- “Transurban claimed liquidated damages of $251.5 million from TOJV for the late completion of the Melbourne CityLink”.

Citylink Media Release - 27th November 2001
Feb 2003 - Victorian Public Transport Ticketing System

“In February, the Victorian Government completed payment of a $65 million settlement to ERG subsidiary OneLink after changes made to the project design at a late stage blew out the budget of OneLink's Melbourne public transport ticketing system rollout.” The Age  June 24th 2003
August 2003 - RMIT - Academic Management System

- “The AMS project displayed a lack of essential rigour and a lack of effective risk management”
  Victorian Auditor Generals Report 2003

- “Original estimate was $12.6 million it is now anticipated to cost $47.3 million by the end of this Year”
  The Australian – August 5th 2003
Attributes of “Scope Manager”

Excellent skills in:
- Business analysis
- Metrics and Function points
- Communication
- Management Reporting

Report to:
- Project Board / Project Sponsor

Paid by:
- Project Budget/client/supplier

Independence
Project Activities – Metrics Based Governance

FPA Size “Estimate”

Business Case

Feasibility Study

Approval

ISBSG Industry Productivity Data

BENEFIT - Independent project estimates based Industry data from ‘best practice’ experience or reality check on client budget.

Effort, Cost and Duration Estimate

Budget allocation

©Total Metrics
Will the software be delivered in time and be worth the Business Value?

- ✓ 300 ~ 500 function points
- ✓ Delivery ~ 7 to 9 months
- ✓ Cost ~ $390k to $580k

Budget Approval

✓ Develop Requirements / RFT
Project Activities – Metrics Based Governance

Requirements Specification

Functional Analysis

Requirements Assessment & Refinement

Requirements Functional Size

Requirements Function & Data Catalogued List + Profiles

BENEFIT – Independently reviewed, auditable, quantified, traceable list of requirements

©Total Metrics
Baseline List of Individual Requirements
Profile and Quantify Requirements

Core Functions selectively identified and selectively sized = 300fps of total of 450 fps
## Re-Estimate – Java, J2EE

<table>
<thead>
<tr>
<th></th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function Points</td>
<td>400</td>
<td>550</td>
</tr>
<tr>
<td>PDR hrs/FP</td>
<td>17</td>
<td>21</td>
</tr>
<tr>
<td>Effort hours</td>
<td>5,442</td>
<td>7,197</td>
</tr>
<tr>
<td>Duration months</td>
<td>9.0</td>
<td>11.4</td>
</tr>
<tr>
<td>Cost</td>
<td>$642,108</td>
<td>$849,255</td>
</tr>
<tr>
<td>Cost $/FP</td>
<td>$1,167</td>
<td>$2,123</td>
</tr>
</tbody>
</table>
Project Activities – Metrics Based Governance

Tender Response Evaluation

- %Match against RFT Function & Data Catalogue Lists
- Compare against Initial Effort, Cost and Duration Estimate
- Suppliers total cost and schedule

Select Supplier

Suppliers Functional Solution

Suppliers Price Dollars per FP

Estimates Reality Check

BENEFIT – Independent evaluation suppliers price and schedule estimates. Quantitative match of supplier functional proposal

©Total Metrics
Suppliers Solution Mapped to Requirements

Quantify % Match = 205 out of core 300 function points can be delivered without change by the Suppliers Package Solution
Evaluate Suppliers Responses for Reasonableness

<table>
<thead>
<tr>
<th>Estimates</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration months</strong></td>
<td>9.0</td>
<td>11.4</td>
</tr>
<tr>
<td><strong>Cost $/fp</strong></td>
<td>$1,167</td>
<td>$2,123</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Supplies Bids</th>
<th>Cost $/fp</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier A</td>
<td>$1,892</td>
<td>12</td>
</tr>
<tr>
<td>Supplier B</td>
<td>$1,563</td>
<td>10</td>
</tr>
<tr>
<td>Supplier C</td>
<td>$987</td>
<td>6</td>
</tr>
</tbody>
</table>
Project Activities – Metrics Based Governance

Functional Specification

- Specification
- Assessment & Refinement
- Quantify FRS match to Requirements
- RFT
- Estimates
- Reality Check

- Refine Baseline Functional Size and Catalogue
- Budget and schedule constraints
- Advice on Cost & Change Control Model and Metrics


©Total Metrics
Project Activities – Metrics Based Governance

Functional Changes

Specification Assessment & Refinement

Quantify size of Change for Pricing

Estimates Reality Check

Update Baseline Functional Size

Budget and schedule constraints

Implement Change

BENEFIT – Independent objective assessment of the extent of change and assistance with pricing. Quantify impact on planned schedules and budgets.
Quantified Traceable Changes Against Requirements
Project Activities – Metrics Based Governance

Project Progress Reporting

- Earned Value - FPs delivered versus planned schedule.
- Map User Acceptance Testing Test Cases against Functional Catalogue
- Identify and quantify Test Case coverage, hot spots for defects

BENEFIT – Independent assessment of project status by quantifying percent delivered.

©Total Metrics
### Independent Progress Recording

#### Project Team record Actual time against function

#### Completed % Status of Function predicts Effort Consumed

<table>
<thead>
<tr>
<th>TodaysD</th>
<th>25-Apr-02</th>
<th>BFCs</th>
<th>Predicated PDR (hrs/fp)</th>
<th>Completed Stage</th>
<th>Current Completion %</th>
<th>Function Points</th>
<th>Predicted Total Hours</th>
<th>Actual Hours Consumed</th>
<th>Predicted Hours Consumed</th>
<th>Actual Hours Remaining</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week #</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TodaysD</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Completion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Points</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predicted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Predicted</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remaining</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.1 Create Assignment | 2.4 Specified | 26% | 6 | 14.4 | 3.0 | 3.7 | 11.4 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.2 Modify Assignment | 2.4 Specified | 26% | 6 | 14.4 | 5.0 | 3.7 | 9.4  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.3 View / Print Assignment Detail | 2.4 Specified | 26% | 3 | 7.2  | 5.0 | 1.9 | 2.2  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.4.1 Assign Contractor to Assignment | 2.4 Specified | 26% | 4 | 9.6  | 4.0 | 2.5 | 5.6  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.4.2 Remove Contractor Assignment | 2.4 Specified | 26% | 3 | 7.2  | 7.0 | 1.9 | 0.2  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.4.3 List Assignment Contractors | 2.4 Specified | 26% | 4 | 9.6  | 4.0 | 2.5 | 5.6  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.5 Quotation Success | 2.4 Built | 74% | 4 | 9.6  | 6.0 | 7.1 | 3.6  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1.6 List Assignments Date Range | 2.4 Built | 74% | 3 | 7.2  | 1.5 | 5.3 | 5.7  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.1 Create Assignment Type | 2.4 Built | 74% | 4 | 9.6  | 6.5 | 7.1 | 3.1  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.2 Modify Assignment Type | 2.4 Built | 74% | 4 | 9.6  | 5.5 | 7.1 | 4.1  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.3 Delete Assignment Type | 2.4 Specified | 26% | 3 | 7.2  | 1.5 | 1.9 | 5.7  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.4 View Assignment Type | 2.4 Specified | 26% | 3 | 7.2  | 1.5 | 1.9 | 5.7  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 2.5 List /Print Assignment Type | 2.4 Tested | 91% | 3 | 7.2  | 4.7 | 6.6 | 2.5  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| etc................. | etc........ |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| TOTAL          |            |      |   | 119 | 285.6| 105.9| 139.5| 178.2|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |

**Completed Stage**: 8

**Actual Time**: 285.6

**Current Completion %**: 105.9

**Function Predicted**: 139.5

**Effort Consumed**: 178.2
# Progress Reporting

<table>
<thead>
<tr>
<th>start</th>
<th>Week Number</th>
<th>8</th>
<th>Actual Value Calculation based on:</th>
</tr>
</thead>
<tbody>
<tr>
<td>today</td>
<td>25-Apr-02</td>
<td>Actual</td>
<td>Original Plan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hours consumed for FPs delivered</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FPs by Percentage completion</td>
</tr>
<tr>
<td>PDR</td>
<td>1.8</td>
<td>2.4</td>
<td>Recorded by team for work against a function</td>
</tr>
<tr>
<td>Function Points Delivered</td>
<td>58.1</td>
<td>46.5</td>
<td></td>
</tr>
<tr>
<td>Effort Hours Consumed</td>
<td>105.9</td>
<td>132.8</td>
<td></td>
</tr>
<tr>
<td>Effort Hours Remaining</td>
<td>178.2</td>
<td>161.8</td>
<td></td>
</tr>
<tr>
<td>Weeks Remaining</td>
<td>10.5</td>
<td>9.6</td>
<td></td>
</tr>
<tr>
<td>Due Completion Date</td>
<td>07-Jul-02</td>
<td>01-Jul-02</td>
<td>Relationship between Effort and Duration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Predicted by Remaining hours</td>
</tr>
</tbody>
</table>
## Progress Reporting

<table>
<thead>
<tr>
<th>start</th>
<th>Week Number</th>
<th>% Effort Consumed</th>
<th>Calculation based on:</th>
</tr>
</thead>
<tbody>
<tr>
<td>01-Mar-02</td>
<td>8</td>
<td>40.2% ✔️</td>
<td>%FPs Delivered of total compared to that predicted to be delivered for effort consumed</td>
</tr>
<tr>
<td>25-Apr-02</td>
<td>Actual</td>
<td>45.1% ✗</td>
<td>%Schedule Consumed of total compared to predicted to be consumed for the effort expended</td>
</tr>
</tbody>
</table>

**% Effort Consumed of total effort predicted to be consumed for FPs delivered:**
- Actual: 40.2%
- Original Plan: 48.9%

**% Schedule Consumed of total effort predicted to be consumed for FPs delivered:**
- Actual: 45.1%
- Original Plan: 36.0%

**% Product Delivered:**
- Actual: 48.9%
- Original Plan: 39.1%
Project Activities – Metrics Based Governance

Project Implementation

Validation, collation, analysis and submission of Project Metrics.

Project Productivity and Quality Assessment Report

Contract Signoff

BENEFIT – Independent assessment project productivity and process. Expert to assist in the collation of data for submission to the ISBSG Repository and interpretation of results.
Case Studies

Case 1 - Win / Win

- Complete functional requirements
- Successful implementation, on time, on budget and all requirements
- Good Productivity rates
- Ongoing good relationship
Case 2 – Conflictive

- Supplier estimates unrealistic
  - Early warning of potential over runs

- Supplier status reporting not reflective true situation
  - Quantitative assessment of functionality delivered to UAT

- Requirements not all implemented
  - Quantitative assessment of functionality omitted for price negotiations
Which Projects Need Governance?

- High risk
- New / inexperienced project management
- High profile
Cost / Benefit Analysis

Cost ? = 1 – 3 % of software cost
• depending on:
  • level of activities
  • Size of project
  • Internal or external consultant

Cost of not having it ?
• 0 – >100% of project cost
Key Success Factors?

✓ FPA is a standardised, structured method to identify, classify and quantify functionality to be delivered
✓ Independence of Scope Manager
✓ Certification of Scope Manager
✓ Reporting at Project Board Level
✓ Commitment both Client and Supplier
✓ Customisation of method to suit Project
✓ Transparency of the process
✓ Availability of relevant ISBSG data