Earned Value Prediction
(Are we really on budget and on time?)

Practical Software and Systems Measurement (PSM) February Technical Working Group Meeting
Nathan Shirley

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Agenda

• Why High Maturity
• Quantitative Analysis Process
• Baseline
• Goals to Achieve
• Processes and Sub-processes
• Measures
• Earned Value Prediction Model
• Question and Answer
Why High Maturity

- Continuous Process Improvement
- Reduce Cost (Testing and Re-work)
- Leverage Use of Existing Tools
- Quantitative and Objective Measures for Delivery and Quality
- Relevant Metrics to Improve Project Delivery
- Competitors
1. Establish Quantitative Analysis Baseline
2. Complete Goal Question Metric analysis (GQM)
3. Develop Measurement Processes and Tools
4. Implement Measurement Program at Project Level
5. Collect data
6. Analyze Data (cleanse data)
7. Determine Baselines and Models
8. Additional Analysis (sub-processes and hypothesis)
Quantitative Analysis Baseline Areas

- Customer Satisfaction
- Product Quality
- Schedule Management
- Cost and Effort
- Sizing and Stability
Establish Goals

Corporate Strategic Imperatives

Imperative 1
Imperative 2
Imperative n

Strategy 1 for Imperative(s)
Strategy 2 for Imperative(s)
Strategy 3 for Imperative(s)
Strategy n for Imperative(s)

Organization Strategy

Quality & Process Performance Objectives

• On Time
• On Budget
• High Quality

Financial and Customer Goals

• Sales Goals
• Profitability
• Customer Satisfaction
• Employee Satisfaction

Organization Goals

Project

Quality & Process Performance Objectives

• Deliver within X Days of Due Date
• Hours within X% of Budget
• < X Critical Defects still open

Financial and Customer Goals

• X% Sales Growth
• X% Profitability
• X% Customer Satisfaction
• X% Employee Satisfaction

Drives

Achieves
Select Processes to Examine

Delivery Processes

- Planning
- Analysis
- Design
- Build and Test
- Deployment

Input
- Estimates
- Work Plans

Cost and Schedule Measures
- BCWP, BCWS, ACWP
- Cost Performance Index
- Schedule Efficiency Index
- Estimate to Complete
- Cost Variance
- Schedule Variance

Quality Review Process

Plan
- Plan for Review

Execute
- Prepare for Review
- Conduct Review
- Perform Rework
- Analyze Review Results

Peer Review Measures
- Peer Review Effectiveness
- Peer Review ROI
- Peer Review Problem Detection
- Peer Review Prep Time
Process Link to Goals

**Delivery Process**
- **QPM**
  - Detailed Work Plans with Planned Schedules and Effort
  - Track Cost and Schedule at the Team Task Level
  - Complete Analysis “Real Time”
  - Compare against Organizational Baselines (our average and normal statistical variance)
  - Determine Causes
  - Take Corrective Actions Early
  - Predict Delivery Date and Cost (EVP Model)
  - Share Planned vs. Actual and Estimates

**Estimating Process**
- Drives Data & Baselines

**Quality Process**
- **QPM**
  - Document Peer Reviews
  - Analyze Peer Review Data at the Team Level
  - Complete Analysis “Real Time”
  - Compare against Organizational Baselines (our average and normal statistical variance)
  - Determine Causes
  - Take Corrective Actions Early
  - Predict Test and Quality Results (Problem Detection Model)
  - Improve the Quality Process

**GOALS**
- **Sales**
  - Deliver
    - On Time
    - On Budget
  - Improve Client Satisfaction
  - Deliver
    - High Quality
    - X Critical Defects
    - Required Solution
  - Reduce
    - Defects/Faults
    - Testing Rework X%

**Profit**
- Deliver
  - X% Ahead of Schedule
  - X% Under Budget

**Use Data Analysis to Improve the…**

**Drives Data & Baselines**
What is Quantitative Project Management

Quantitative Project Management (QPM) is the end result of setting quantifiable project levels goals for delivery and quality process performance, establishing baselines to determine if projects can meet those goals, and taking corrective actions when performance is outside those baselines.

Goal
- On Time
- On Budget

Measure
- Task Level
- Event Level

Analyze Results
- Using SPC (control charts)
- Performance Baselines

Predict Results
- EV Prediction Model
- Problem Detection Model

Cost Performance Index (CPI)

Take Corrective Actions
- Increase Training and Knowledge Transfer
- Replace Resources
- Baseline Requirements
- Implement CCB
Cost Performance Index (CPI) = Budgeted Cost of Work Performed (BCWP) / Actual Cost of Work Performed

Schedule Efficiency Index (SEI) = Budgeted Cost of Work Performed (BCWP) / Budgeted Cost of Work Scheduled (BCWS)
Earned Value Prediction Model

Budgeted Cost at Completion (BCAC) = Budgeted Cost on the planned Finish Date

Estimate at Completion (EAC) = BCAC / CPI and Planned Days to Complete / SEI

Planned Days to Complete = Planned Finish Date – Project Start Date

Project Specification Limit = Limit set by project based on customer or project requirements

Organization Baseline = Control limits set by analysis of the delivery process performance

Actual Cost of Work Performed (ACWP) = Actual cost of tasks that are 100% complete
Lessons Learned

- Don’t under estimate the power of a sponsor
- Start with the measures the project managers are being measured against
- Start with the end in mind (high maturity begins at Level 2)
- Clear Link to Organizational Objectives
- Develop coaches and stay in contact
- Leverage other organizations (inside and outside)
Questions and Answers