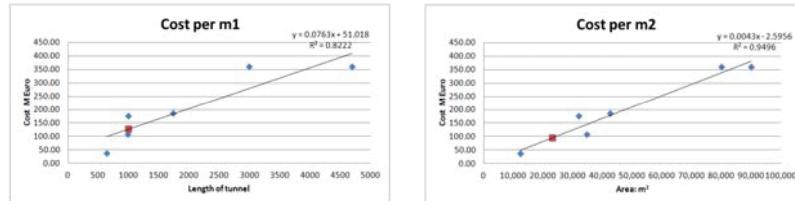


PE Challenge



- Determine correlation



- Validate correlation
 $m1: R^2 0.822$
- Estimate the new object

$m2: R^2 0.949$

| Name | Location | Cost | Characteristics | | | |
|-----------------|----------|--------|---------------------------|---------------------|----------------------|--------|
| | | | Area [m ²] | Predicted Cost [M€] | Excluding Outlier | |
| Bridge | | | | | | |
| A | | 185.00 | 42,500 | 42,500 | 178.62 | 178.62 |
| B | | 38.59 | 12,300 | 12,300 | 49.85 | 49.85 |
| C | | 107.00 | 34,650 | 34,650 | 145.15 | 145.15 |
| D | | 360.00 | 79,900 | 79,900 | 338.10 | 338.10 |
| E | | 360.00 | 79,900 | 90,000 | 381.16 | 381.16 |
| F | | 176.31 | 32,000 | 32,000 | 133.85 | 133.85 |
| Forecast | | | | 23,000 | 95.48 | 95.48 |

Parametric Estimating Extended



- Single correlation (2 parameters)
PE Example
 $y = 0.0043x - 2.5956$
- Multiple correlation
(multiple interdependent parameters)

Key Inputs

| Input | Definition |
|-------|--|
| S_e | Effective Size. |
| C_w | Effective Technology. |
| D | Staffing Complexity. |
| P_k | Staff Loading, which represents the place on the staffing curve where staff peaks. |
| F_s | Staff Loading Scale Factor, computed from P_k . |

Key Outputs

| Output | Definition |
|--------|--|
| K | Life-Cycle Effort, or the total area under the staffing curve. |
| t_p | Schedule to the peak of the staffing curve. |

Finding Staffing Rate with the Front Loaded Rayleigh

Staffing rate is defined as the derivative of the staffing curve at time = 0. The derivative of the staffing curve with the front loading parameters is:

$$p'(t) = \frac{F_s K}{(P_k \% t_d)^2} \left(e^{\left(\frac{-t^2}{2(P_k \% t_d)^2} \right)} + \left(\frac{-2t^2}{2(P_k \% t_d)^2} \right) e^{\left(\frac{-t^2}{2(P_k \% t_d)^2} \right)} \right)$$



SEER SEM “Base” settings



- Component structure

The Project WBS tree on the left shows a hierarchy of project components:

- Σ 1: Project Challenge
 - 1.1: Traffic Control System / Security Bridge (Fixed)
 - 1.1.1: Traffic Control Algorithms
 - 1.1.2: Signal Processing
 - 1.1.3: Data Link Communications
 - 1.1.4: Wind control processing
 - 1.1.5: Integrity Analysis on the signal processing
 - 1.2: Traffic Control System / Security Bridge (Open)
 - 1.2.1: Traffic Control Algorithms
 - 1.2.2: Signal Processing
 - 1.2.3: Data Link Communications
 - 1.2.4: Wind / Status control processing
 - 1.2.5: Integrity Analysis on the signal processing
 - 1.3: Security Tunnel
 - 1.3.1: Traffic Control Algorithms
 - 1.3.2: Signal Processing
 - 1.3.3: Data Link Communications
 - 1.3.4: Fire / Air control processing
 - 1.3.5: Integrity Analysis on the signal processing

The Inputs tab of the SEER SEM interface on the right displays parameters for the "Traffic Control Algorithms" program. The "Decision Support Languages" section is circled in red.

| | Least | Likely | Most |
|-----------------------------------|--------|--------|---------|
| Decision Support Languages | 450 | 550 | 700 |
| New Functions | 0 | 0 | 0 |
| Software phase at estimate | 0 | 0 | 0 |
| Funcs to be deleted in pre-exstg | 0 | 0 | 0 |
| Softw. reuse at estimate | 5.00% | 10.00% | 40.00% |
| Redesign required | 1.00% | 5.00% | 10.00% |
| Implementation required | 10.00% | 40.00% | 100.00% |
| Retest required | 0 | 0 | 0 |
| Pre-exists, designed for reuse | 0 | 0 | 0 |
| Pre-existing functions | 0 | 0 | 0 |
| Funcs to be deleted in pre-exstg | 0 | 0 | 0 |
| Software phase at estimate | Done | 5.00% | 10.00% |
| Redesign required | 1.00% | 5.00% | 10.00% |

- Minimal Requirements:
Size
Technology
General Characteristics (“Environment”)

SEER SEM “Environment” settings



- Manual

The Personnel Capabilities & Experience table on the left shows ratings for various capabilities:

| | Least | Likely | Most | Note |
|--|-------|--------|------|------------------------|
| PROGRAM: New Development | Nom- | Nom+ | Hi | |
| PERSONNEL CAPABILITIES & EXPERIENCE | | | | |
| Analyst's Capabilities | Nom- | Nom+ | Hi | Build previous version |
| Analyst's Application Experience | Hi | Hi | Hi | |
| Programmer's Capabilities | Low | Nom | Hi | |
| Programmer's Language Experience | Nom | Hi | VHi | |
| Development System Experience | Hi | Hi | Hi | Build previous version |
| Target System Experience | Hi | Hi | Hi | Build previous version |
| Practices & Methods Experience | Nom | Hi | VHi | |
| DEVELOPMENT SUPPORT ENVIRONMENT | | | | |
| Development Practices Use | Nom- | Nom | Nom+ | |
| Automated Tools Use | Hi | Hi | Hi | Framework available |
| Turnaround Time | VLo | Low- | Nom | |
| Response Time | Low- | Nom+ | Hi | |
| Mobile Dev Environment | Nom | Nom | Nom | |

The Development System Experience table on the right shows ratings for development system experience:

| | 2 LEXP | 3 DEXP | 4 TEXP | 5 PEXP |
|---|----------------------------|----------------------------|----------------------------|----------------------------|
| Rating | Low- | Nom | Hi | Low- |
| Description | 2.00 | 1.00 | 0.40 | 1.07 |
| Years Average | (0.31) | (0.31) | (0.31) | (0.22) |
| Development team average years of experience with development computers, operating systems, job control languages, and other items used to develop the software, as of development start. | | | | |
| Rating | Extra High | High | Medium | Low |
| Description | More than 3 Years Average | 3 Years Average | 2 Years Average | Less than 4 Months Average |
| Rating | Very High | High | Medium | Low |
| Description | 3 Years Average | 2 Years Average | 1 Year Average | 4 Months Average |
| Rating | Normal | Normal | Normal | Normal |
| Description | 1 Year Average | 1 Year Average | 1 Year Average | 4 Months Average |
| Rating | Low | Low | Low | Low |
| Description | 4 Months Average | 4 Months Average | 4 Months Average | Less than 4 Months Average |
| Rating | Very Low | Very Low | Very Low | Very Low |
| Description | Less than 4 Months Average |

- Help

Development System Experience
 Development team average years of experience with development computers, operating systems, job control languages, and other items used to develop the software, as of development start.

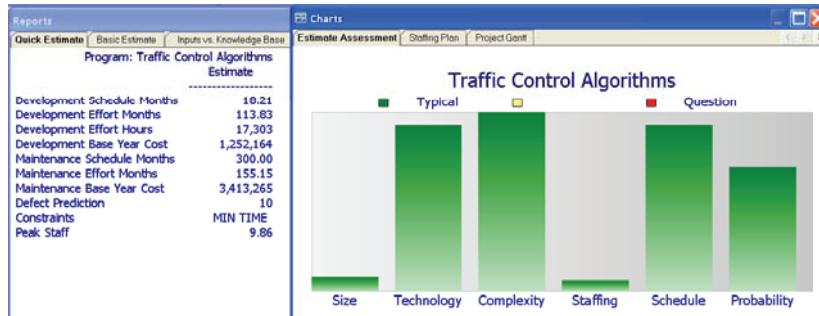
| Rating | Description |
|------------|----------------------------|
| Extra High | More than 3 Years Average |
| Very High | 3 Years Average |
| High | 2 Years Average |
| Normal | 1 Year Average |
| Low | 4 Months Average |
| Very Low | Less than 4 Months Average |

See Also: [Development System Validity](#) [Development System Complexity](#)

Tunnel Safety System



- Estimate



- Results:
Effort / Cost
Schedule
Quality (Defects)

Both for Development & Maintenance (25 years)

External Validation



- Benchmark estimate with ISBSG

