SEER® for Software: Cost, Schedule, Risk, Reliability

SEER project estimation and management solutions improve success rates on complex software projects. Based on sophisticated modeling technology and extensive knowledge bases, SEER solutions help organizations assess up-front project feasibility, optimize project costs and schedules, assess risks and probabilities, monitor project progress, and initiate appropriate mid-course corrections (if needed) to keep projects on track.

All SEER solutions are built on the same design principles, incorporating the following application elements:

- Annotated and guided interface for defining projects

- Parametric simulation engine

- Extensive project-applicable Knowledge Bases

- Numerous standard and custom reporting options

Open architecture and APIs ensure that SEER applications can be easily integrated with departmental productivity solutions and enterprise applications.

A DIFFERENT KIND OF PROJECT MANAGEMENT: AVOID SURPRISES

SEER by Galorath solutions fill a missing link between project design and project execution… Project Portfolio Planning, enabling organizations to rapidly establish an integrated project lifecycle plan: Developing a concept > testing its feasibility > optimizing project costs, schedules, quality and risk > monitoring and controlling project progress > identifying when (and what) mid-course corrections will ensure the project stays on track.

NOT-SO-BEST PRACTICES ELIMINATED

Many estimates today are prepared more or less manually based on one of the following approaches:

- Ballpark > Rough Order of Magnitude > Guess

- Task Decomposition > Top-down > Constraint Estimate

- Task Decomposition > Bottom Up/Design Estimate

Regardless of the methodology selected, the real reason so many estimates fall short is that they tend to rely heavily on the availability of scarce, over–committed personnel and manual or minimally-automated processes, such as spreadsheets and other homegrown tools. SEER replaces that with repeatable, consistent planning.

One-off practices are, by definition, non-repeatable and highly susceptible to human error. Individual planners may be overly optimistic or pessimistic. They may be influenced by internal politics or other factors unrelated to the project, "fact free planning". They may over or under-estimate the impact of risk and uncertainty ignoring or underestimating risks. Or they may simply overlook some of the less obvious project elements.

WHAT IS PARAMETRIC MODELING?

Parametric methods are very useful for subjecting uncertain situations to the rigors of a pre-defined and validated mathematical model. They can usefully embody a great deal of prior experience and are less biased than human thought processes alone.

Parametric modeling takes its name from the project parameters or variables that are modified during the project simulation process. Parametric modeling provides "fact based" estimating techniques including mathematical equations as well as interpretation of historical data. Repeatable processes are also supported.

With parametric modeling various stakeholders can understand software effort, schedule, cost and risk by examining clear influencing factors and their uncertainty. SEER becomes the language of planning.

SEER® by GALORATH
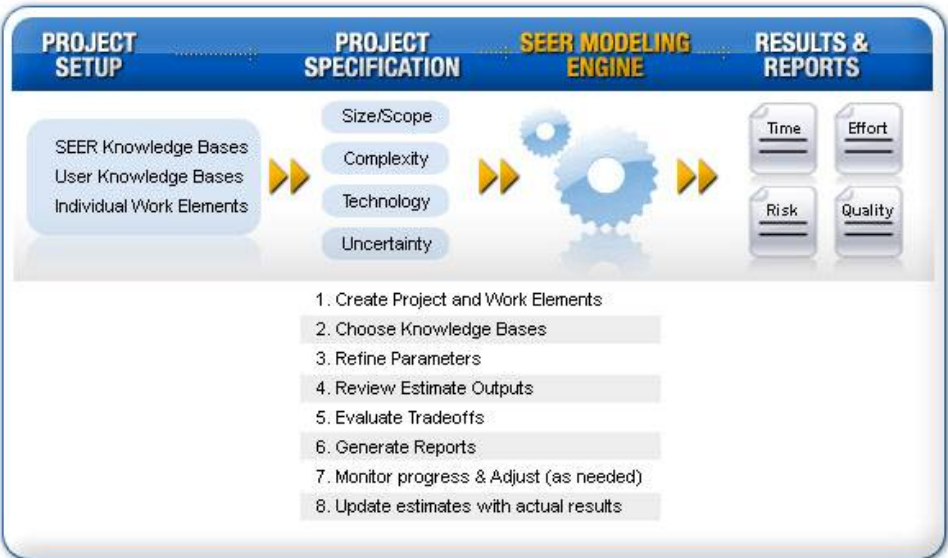
SEER Parametric Modeling Process

SEER technology provides project results by generating a virtual project based on:
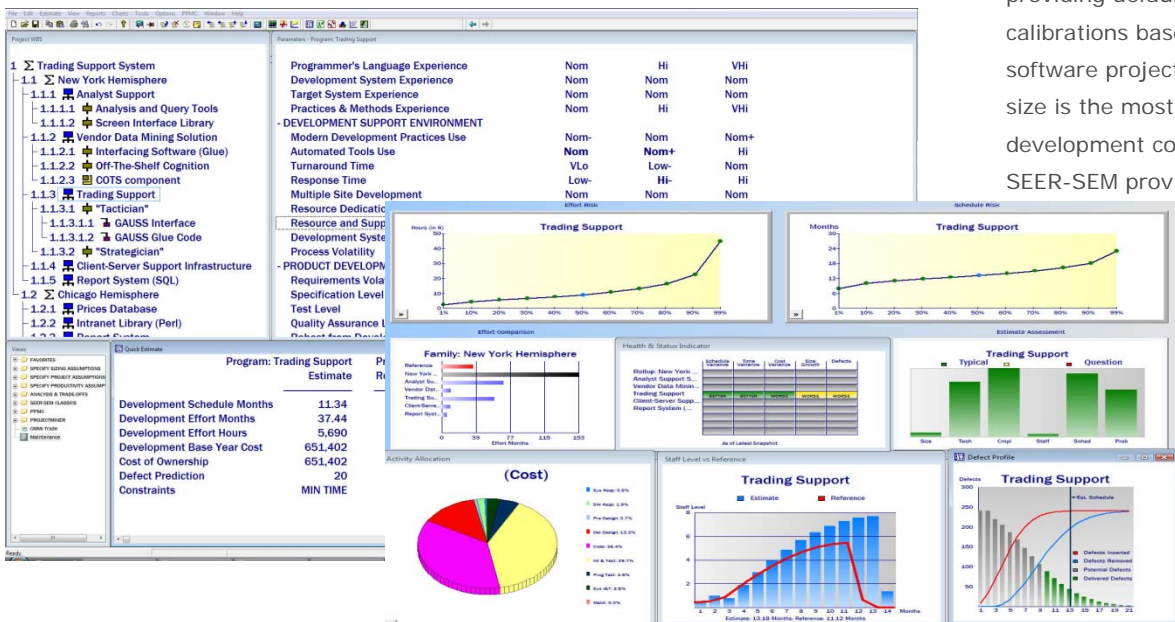
The SEER Modeling Engine:
SEER mathematical models are derived from extensive software project histories, behavioral models, and metrics. SEER for Software (SEER-SEM) employs a multi-faceted approach to project estimating, leveraging industry and/or company project histories and proven formulaic cost relationships. Initially, SEER-SEM generates an overall effort and schedule estimate based on project size, complexity and a myriad of productivity factors. Initial estimates can be generated in minutes, then refined based on project constraints such as staffing limitations and schedule requirements. Finally, the estimate is allocated to time phases and labor categories, providing a detailed plan based on project assumptions. Costs are computed based on project-specific labor rates.

SEER Knowledge Bases:
Serve as a virtual "in-house expert," providing default values, ranges, and calibrations based on comparable software project histories. As software size is the most significant driver of development cost, effort, and schedule, SEER-SEM provides extensive functionality to assist in sizing calculations.

Together, these capabilities enable users to develop first-look estimates when very little information is known, and to refine those estimates as details become available over time.

DEVELOPING AN ESTIMATE

A high-level software estimate can be developed in a matter of minutes using SEER's intuitive, windows-based interface for defining and describing projects. Generate a new project from an existing project "template" or from scratch by adding and defining individual work elements. Define a project by platform, application, development methodology, and governing standards, for example, and SEER will provide a set of default parameter values and estimates based on the project histories which most closely match your selections.

USING & DOCUMENTING RESULTS

A variety of charts, graphs dashboards, and reports enable users to quickly test and assess project options and evaluate work-in-progress. Results can be documented and shared using SEER's rich reporting capabilities, or can be exported to Microsoft Project, Microsoft Office, IBM Rational, and other 3rd-party applications. SEER for Software facilitates project estimation and management throughout the development lifecycle:

Go-No-Go Decisions: Extensive Knowledge Bases, sizing analogies, and size-by-comparison capabilities enable users to develop rough order of magnitude estimates early in the conceptual process.

Detailed Estimates: Flexible Work Breakdown Structure (WBS) and sizing options enable users to develop detailed estimates for virtually any project configuration and scope.

Trade-off and Risk Analysis: Perform detailed "what if" analyses to test and optimize time, cost and quality options, and determine probabilities of meeting project objectives. As parameter values are entered or changed, SEER-SEM updates estimates in real-time, enabling users to quickly assess numerous project options, alone and in combination.

Project Plans: Formulate detailed project plans and export to 3rd-party resource and portfolio management applications.

Project Definition	
Sizing Options	SLOC, function points, use cases, bottoms-up, object, features, and others. You may also define your own size metrics.
Work Breakdown Structure	Multiple indenture, detailed sub-element, roll-up, merge
Knowledge Bases	Environment, application, re-use, development method, custom
Data Import	Dynamic data import and cut and paste
Parameter Input	Schedule, staffing levels & capabilities, requirements specification & volatility, development & target environment, economic factors, COTS
Enterprise Database	Store project estimates into a controlled enterprise database and maintain a versioning system for your estimates
Adaptable	Customize to your organization's unique terminology and methods
Predictive Algorithms	
Development Effort and Cost	Effort/cost/schedule for requirements, development, integration & test
Schedule	Elapsed schedule for all activities
Staffing Profiles	Resources required by month
Support/Maintenance	Effort/cost for a defined maintenance period
COTS Integration	Effort/cost and schedule impact of integrating off-the-shelf software
Quality/Defects	Defect tracking during development and defects delivered at completion
SEI CMMI	Parametric estimate of the SEI CMMI level
Analysis & Trade-offs	
Side-by-side Comparison	Baseline vs. "what-if" scenarios
Integrated Risk Analysis	Input ranges, effort & schedule confidence, Monte Carlo risk and schedule assessment
Set Project Objectives	Estimates for different objectives and constraints, e.g., minimizing time, minimizing effort, or meeting specific staffing requirements.
Quick Plan	Rapidly evaluate staffing constraints & schedule requirements impacts
Project Tracking	Evaluate your in-process project metrics against plans while it is underway using performance based re-forecasting methods.
Learn from Past Projects	Incorporate completed project metrics into project history database and use for sizing, benchmarking and calibrating future estimates.
Charts & Graphs	
Activity Allocation	Allocation of cost or effort by major software development activities
Labor Category Allocation	Allocation of cost or effort by major software labor categories
Size Allocation	New, Pre-existing/re-use, Pre-existing/no reuse allocation
Estimate Assessment	Estimate quality against key indicators
Technology Assessment	A "sanity check" for the technology and environment parameters
Sensitivity	Sensitivity of a parameter to effort, schedule, defects across a range
Risk	Effort, schedule, cost & defect estimates for confidence levels
Benchmark vs. Knowledge Base	Estimate versus historical percentiles
Estimate vs. Knowledge Base	Effort and schedule between the Knowledge Base range estimates
Staff Level vs. Reference	Estimated staff over the estimated schedule versus a set reference
Top 10 Effort Impact	Input parameters ranked in terms of relative impact on total cost
Staffing Plan	Predicted or realized staffing requirements over time
Project Gantt	Schedules for each project (can be interactively adjusted)
Defect Profile	Defect insertion and removal rates over time
Effort/Schedule Trade-Off	Effort and schedule between minimum time and optimal effort t
Effort/Schedule Comparisons	Effort and Schedule between WBS elements
Reports	
User Defined Reports	Flexible export framework for defining customer reports
Quick Estimate	Quick view of estimate (configurable)
Basic Estimate	Overview including major milestones, size metrics, productivity
Annual and Monthly Reports	Cost/effort by year; cost/effort/staff by month
Labor Category Reports	Cost/effort/hours by labor category
Activity Report	Cost/effort/schedule by activity (phase)
Software Metrics	Details for size, technology and productivity metrics
Estimate to Complete	Work remaining by project phase and cost, also estimate at complete
Risk Analysis	Project estimates for varying confidence levels
Time Phased Defects Report	Cost/quality tradeoffs for early and deferred delivery
Integration	
Comprehensive SEER API & linking	Integrate with other applications using an Automation interface. Also supports COM linking so you can link estimates to tools such as Excel
Dynamic Data Import	Link data from enterprise applications and databases
Flexible Export	Define data exports from hundreds of unique output and input items; define and save common data export formats
3rd-party Integrations	Microsoft Project, IBM Rational, and Oracle Crystal Ball.

Project Monitoring/Control:
Quickly assess project progress and evaluate corrective actions (as needed) to keep projects on track.

Continuous Improvement:
Metrics on completed projects can be incorporated into a project repository for model calibration and refinement, trending analysis, and sizing of future software projects.

EXTENDED CAPABILITIES

The SEER for Software family includes a number of options for extending the capabilities of the core solution:

Estimate by Comparison

A feature for estimating software size, the single most significant driver of development cost, effort, and schedule. Estimate by Comparison helps the user define software scope through a series of project analogies and/or comparisons to a user's repository of past projects. In this way, users can develop a reliable estimate on a project's scope even when information is scarce. Results can be generated in various sizing units including Function Points, Source Lines of Code (SLOC), Use Cases and SEER's unique function based sizing which approximates function points without function point training.
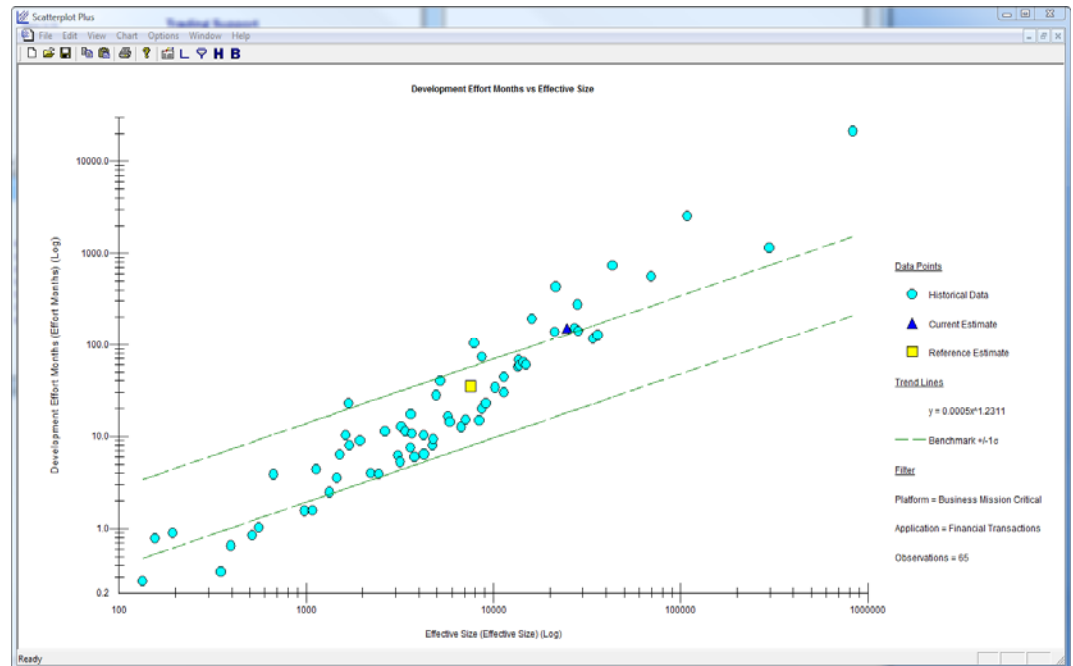
The Sizing Process:

1. Identify programs / projects to be estimated

2. Select reference items which are the best match to the current project; reference items can be entered manually, selected by analogy, or obtained from a repository of past projects.

3. Establish the relative size between reference items and the current project.

4. Analyze and share reports/charts and incorporate results into SEER-SEM analyses and estimates.

Metrics Analysis & Benchmarking

Enables users to benchmark estimates and trends in graphical format. Users can filter/narrow project histories to include only the most relevant projects.

SEER includes industry trend lines and shows how your project compares to industry and best practices and compares to your own project history as you collect it.

SEER is also available with data repositories from The International Software Benchmarking Standards Group (ISBSG). ISBSG provides the largest open repository of software project history and includes standardized, verifiable data from over 4,000 software projects.

Project Monitoring and Control

Enables users to monitor the health and status of work in progress. Helps identify root causes and determine the best corrective actions. Project progress can be described in four dimensions:

- Activity completion (planned/actual)
- Expenditures (budgeted/actual)
- Size growth (planned/actual)
- Defect discovery/removal (predicted/actual)

SEER yields a software specific *estimate to complete* that is a reflection of project progress. Once a project is completed, project data can be used for calibration, allowing users to apply experience to future estimates. Dashboards provide project health & status so managers can quickly assess progress and needs.

Independent Crosscheck & Verification

Available to organizations that require independent oversight. This option invokes a separate estimation methodology to calculate the estimate as a "sanity check" against initial results. Databases of past software development and established statistical techniques and algorithms are employed to develop a "data-driven" software estimate.

Integration to MS Project

Automatically constructs a complete project plan from any SEER-SEM project estimate. Create customized lifecycle templates incorporating your own processes and best practices, and tailor allocation of the amount and types of effort estimated into labor categories that you specify. The

Integration to MS Project also enables users to generate full SEER estimates and plans from within the MS Project application.

Integrations to IBM Rational

Provides a complete single-source solution addressing software design, feasibility analysis, design optimization, and portfolio management.

SEER-IBM Integrated Process:

1. IBM Rational RSx captures business process design and system requirements and translates use cases into executable code.

2. SEER estimates cost, effort, risk, and schedule; evaluates trade-offs that impact feasibility and design; and tracks work-in-progress to ensure the project is completed as planned.

SEER-IBM Rational integrations have been validated for inclusion in the IBM Rational software program.

Enterprise Shared Database

The open database allows users to save, maintain, and share project estimates throughout the enterprise.

The SEER Enterprise Database also includes features for archiving, version control, and access control of project data as well as the ability to pre- and post-process the database information for integration with external applications.

ABOUT GALORATH

Galorath Incorporated has invested more than two decades developing solutions to help government and commercial organizations plan and manage complex projects. SEER solutions combine an intuitive interface, extensive project-applicable knowledge bases, sophisticated project-modeling technologies and rich reporting features to expedite the planning process and keep projects on track.

SEER solutions are employed by thousands of users worldwide in financial, manufacturing, high-technology and government institutions to obtain a rapid and powerful view of the critical factors driving program decisions and success.

ON TIME. ON TARGET.

- Develop accurate project estimates more quickly based on sophisticated project simulation/parametric modeling technology.

- Test projects in the conceptual phase when little information is known.

- Understand and manage software project cost drivers.

- Develop realistic schedule, cost, and staffing estimates based on the industry's most comprehensive software project Knowledge Bases.

- Analyze complex and interdependent project options and trade-offs across the software lifecycle (design, development, maintenance, enhancement and support.)

- Evaluate potential cost-benefits of commercial off-the-shelf software (COTS), software re-use, and modern development methodologies.

- Assess risks/determine probabilities for achieving schedule and cost objectives.

- Integrate SEER for Software estimates into SEER for IT and SEER for Hardware, Electronics & Systems.

Galorath Incorporated
Phone: +1 (310) 414.3222
Fax: +1 (310) 414.3220
E-mail: info@galorath.com

Galorath International
Phone: +44 (0) 207 788 9042
Fax: +44 (0) 207 138 2642
E-mail: international@galorath.com

www.galorath.com