Estimating Software Enhancement Projects

Ian Brown
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Agenda

- What is an enhancement project?
- Why is estimating enhancements so tricky?
- How to leverage SEER-SEM
- Estimation methodology
- Improving future estimates
What is a software enhancement project?

- Software already exists
- Changes to the existing software have been requested
  - Modifications to some current functionality
  - Additions of new functionality
  - Other changes, such as platform or language migration
- Does not include more traditional maintenance activities (that’s a whole different topic)
- Project is responsible for delivering an updated version of the software

You need to be able to estimate cost and schedule of that delivery in order to plan resources and manage expectations.
Accurate estimation of enhancement projects can be difficult

- How will the current system be impacted?
- What is the size of the expected enhancements?
- Is the additional functionality brand new or is it similar to existing functionality?
- If it is similar, can existing functionality be reused or modified to meet the requirements?
- What extent of rework will modifications require?
- Do you need to retest the entire application?
- How do all these factors translate into cost and schedule?

These questions are not easily answered, especially if no historical data exists
SEER-SEM’s Acquisition Method knowledge base provides the foundation of a structured estimation methodology.

- When no better information is available, leverage the standard definitions and settings for various acquisition methods that are included in the tool.
Methodology Overview

1. Size the enhancement project

2. Allocate requirements/size to appropriate Acquisition Method categories

3. Build WBS and populate size inputs

4. Tailor model parameters and crosscheck
Step 1: Size the Enhancement

- Any robust software estimation methodology includes some means of estimating and measuring software size.
- Many different ways to define size:
  - Source lines of code
  - Objects
  - Function points

IFPUG standard function points work best with this methodology.

Function Point Workbench
TRANSACTION AND FILE UST
TRACIES
IRNA Functional Enhancements
Baseline Count 01-2005
Enhancement Project

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Requirements

Function Point Size

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Step 2: Allocate requirements to appropriate Acquisition Method categories

- This step involves working sessions between cost analysts, developers, and system analysts who are knowledgeable of existing functionality as well as the requested enhancements
  - Identify what Acquisition Method categories are applicable to the given project
  - Use the detailed definitions provided in SEER-SEM help as guidance for the discussion
  - Link requirements with the Acquisition Method category that best describes the type of work necessary to make the enhancement work

Engaging in this dialogue helps the technical staff think about the problem and approach in a way that is meaningful to the cost analyst.
Step 3: Build the SEER-SEM WBS and populate the size parameters

- If more than one application is included in the project, insert separate Program WBS elements for each
- Insert a Component WBS element for each Acquisition Method category
- Enter allocated size estimates into respective WBS elements
  - If functionality is completely new, enter function points as NEW functionality
  - If functionality is modified/reused, enter function points as PRE-EXISTING functionality (either designed for reuse or not designed for reuse)
Step 4: Tailor model parameters and crosscheck

- Review the other SEER-SEM input parameters to make sure settings are appropriate
  - If the initial application was estimated in SEER-SEM, start with the parameter assumptions in that model and make modifications from there
  - Key parameters: Personnel Capabilities & Experience and Development Support Environment to identify any differences in the enhancement project

- Crosscheck results with benchmarks, analogies, second estimates, or actuals from past projects to gauge realism of estimate
  - Risk Report and Charts facilitate value-added crosschecks
Improvements to the methodology and accuracy of the estimates can be made by tracking project actuals

- Conduct project reviews upon completion
  - Compare estimates to actuals
    - Size
    - Effort
    - Cost
    - Schedule
  - Track changes to requirements throughout project life cycle and update cost and schedule estimates accordingly
  - Review labor mix for labor rate assumptions
  - Review Acquisition Method allocations to see how accurate assumptions were in terms of level of rework

- Document lessons learned, update process documents and guidance

- With actual project data, rework percentage assumptions can be tailored and stored in a Class Knowledge Base
Contact Information

Ian Brown, CFPS
Senior Associate
Booz | Allen | Hamilton

8255 Greensboro Drive
McLean, VA  22102
Tel (703) 902-4971
brown_ian@bah.com