

Ask Pete, Software Planning and Estimation through Project Characterization

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Abstract

Ask Pete, was developed by NASA to provide a tool for integrating the estimation and planning activities for a software development effort. It incorporates COCOMO II estimating with NASA's software development practices and IV&V criteria to characterize a project. This characterization is then used to generate estimates and tailored planning documents.

1. Introduction

What is the best method for minimizing a software project's risks and resources at the same time? Ask Pete (Acquired Software Knowledge Project-Effort-Tool-Estimate) is a tool developed at NASA Glenn Research Center (GRC), and funded by the NASA OSMA and GSFC IV&V Facility to address this very question.

2. Background

Risks to a software project derive from various areas:

- Complexity and constraints of the project
- The development organization(s)
- Consequences of failure
- Investment in the project

In order to fully understand and counter these risks, project managers must understand their project. Ask Pete incorporates a dynamic series of questions that assists in identifying information about various factors based on NASA GRC's software development control level criteria, the NASA IV&V criteria and COCOMO II. The process of answering the questions associated with these different, yet complementary, knowledge bases provides a relatively complete characterization of the project as well as prodding the project manager towards a better understanding of the project and other factors that influence it.

This activity results in an estimate of the resources required, the development and assurance activities that

should be performed, and what, if any, verification and validation or independent assessment activities may be indicated based on the risks and the eventual resources which will be invested in the project. This information is further encapsulated in development and assurance plans which are tailored to the project based on the characterization.

The resource estimate, control level and IV&V share common areas and subsets of the characterization. As the project changes, i.e. increase in scope, the responses collected by the tool should be updated. This may or may not result in a change to the planning and estimates, which is readily apparent by cues on the tool's interface. This ability to monitor how changes to the project can affect changes to the estimates and planning effort allow managers to perform "What if?" scenarios to maximize use of their resources and minimize risks to the project.

Additionally, Ask Pete includes the ability to share information with another NASA tool, Automated Risk Reduction Tool (ARRT), being developed at JPL.

3. Relevance to Requirements Engineering

As with Requirements Engineering, successful management of a software project requires knowledge of the purpose of the system and the contexts in which it will be used. Ask Pete assists project managers in understanding these areas which, in turn, helps to manage the requirements engineering aspects of the project. 'Risky' projects can be identified early in the project lifecycle and steps can be taken to de-scope the project or provide for independent assessment or IV&V to ensure the requirements have been successfully implemented.

4. Research Demonstration

The research demonstration will show how changes in software project characteristics that are under the control of the project manager can have a minimal to large effect and how use of the tool can help minimize both risks and resources. Ask Pete is available at <http://tkurtz.grc.nasa.gov/pete>.