Tutorial:
CoBRA - Cost Estimation, Benchmarking and Risk Analysis Method

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Abstract: CoBRA is a hybrid method for software cost estimation, benchmarking and risk analysis. Utilization of both expert’s knowledge and project data by CoBRA entails numerous benefits over traditional expert-based or data-driven methods. This tutorial gives a short overview of the software cost estimation methods most commonly used in practice. Benefits and drawbacks of selected approaches are presented. The CoBRA method is presented as an alternative to existing data- and expert-based approaches. In addition, practical experiences gained by industrial applications of the CoBRA method are presented.

Duration: Half-day

Intended audience: Software engineers, project managers, quality managers, researchers

Level: Advanced

Prerequisites: Basic software engineering knowledge

Agenda

1. Overview of Cost Estimation Approaches
   - Data-based vs. expert-based methods (benefits, drawbacks)
   - State of the practice

2. The CoBRA Method
   - Motivation
   - Theoretical foundations (model overview)
   - Estimation process
3. Example Application of the CoBRA
   - Building the CoBRA model
   - Applying the model
   - Validating the model

4. Experiences with the CoBRA Method
   - Application costs (effort required to build the model)
   - Benefits
   - Application guidelines (model customization)
   - Enhancement potentials

Contents

Project and program managers require accurate and reliable cost estimates to allocate and control project resources, and to make realistic bids on external contracts. Different techniques for cost estimation have been discussed in the literature.

Despite extensive development of algorithmic models over the last twenty years, recent surveys indicate that very few organizations actually use them. In fact, the most extensively used estimation approach was found to be “comparison to similar, past projects based on personal memory”. There are a number of possible reasons why algorithmic and parametric models are not used extensively. These include the fact that many organizations do not collect sufficient data to allow the construction of such models. On the other hand, in any given organization, it will seldom be possible to find available, highly experienced estimators for every new project. Given the prevalent reliance on informal approaches to cost estimation, many of these estimates would not be easily repeatable either even if the most experienced estimators were available.
CoBRA is a hybrid method for software cost estimation, benchmarking and risk analysis. Utilization of both expert’s knowledge and project data by CoBRA entails numerous benefits over traditional expert-based or data-driven methods. The method is well applicable in the context of low-maturity organizations where only little project data exist. Through various kinds of output provided by CoBRA (point estimate, risk analysis), it does not only support decision makers in planning software project, but also provides means for organizational improvement.

This tutorial starts with an overview of the software cost estimation methods most commonly used in practice. Benefits and drawbacks of selected approaches are presented. Next, the CoBRA method is presented as an alternative to existing data- and expert-based approaches. Theoretical foundations of the method as well as related estimation processes are explained. Finally, example applications of CoBRA are presented. The tutorial concludes with practical experiences gained by industrial applications of the CoBRA method.

References

- M. Bundschuh, A. Fabry: Aufwandschätzung von IT-Projekten (2. auflage), mitp-Verlag, Bonn, 2004