

ABSTRACT

A Quantitative Analysis of Estimating

Accuracy in Software Development

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This research quantitatively examines the estimating accuracy of over 5000 standardized resource consuming activities from 39 software development projects of various size which were accomplished at the U.S. Air Force Data Systems Design Center. The activity data pertaining to planned hour estimates and actual expenditures were collected by an automated project management system (PARMIS) as the data were generated.

The dissertation hypothesizes that specific activities can be isolated which consistently have a greater influence on whether a software development project will be successful in terms of cost and schedule estimates. The arithmetic and percent differences between estimated and observed hour expenditures are the elementary variables used to investigate estimating accuracy. Various summarizing and statistical techniques are employed to reveal the information inherent in the data, and to identify, if possible, a correlation between the selected activities and the final difference between the total hours estimated and expended for the project. The findings from the data source used clearly support the hypothesis. However, no correlation was found between the activities which have the most influence on estimating accuracy in a software development project and other criteria such as the total project difference. The

primary conclusion of this work is that software estimation is still very poor and inconsistent because the existing model for software development and traditional estimating techniques are incompatible. A new development model is described in addition to a recommendation for a centralized, standardized, software project management system which would service several different agencies developing different types of projects.