Chapter VIII

What is the Best Technique?

Abstract

Although numerous studies on Web effort estimation have been carried out to date, there is no consensus on what constitutes the best effort estimation technique to be used by Web companies. It seems that not only the effort estimation technique itself can influence the accuracy of predictions, but also the characteristics of the data set used (e.g., skewness, collinearity; Shepperd & Kadoda, 2001). Therefore, it is often necessary to compare different effort estimation techniques, looking for those that provide the best estimation accuracy for the data set being employed. With this in mind, the use of graphical aids such as boxplots is not always enough to assess the existence of significant differences between effort prediction models. The same applies to measures of prediction accuracy such as the mean magnitude of relative error (MMRE), median magnitude of relative error (MdMRE), and prediction at level 1 (Pred[25]). Other techniques, which correspond to the group of statistical significance tests, need to be employed to check if the different residuals obtained for each of the effort estimation techniques compared come from the same population. This chapter details how to use such techniques and how their results should be interpreted.
Introduction

Previous studies in Web effort estimation have used different techniques to estimate effort for new projects, each with a varying degree of success. We have seen in Chapter II that to date there is no single effort estimation technique that always provides the most accurate prediction, and that the identification of such a technique may perhaps never occur. It seems that there is a relationship between the success of a particular technique and factors such as the size of the training set, the nature of the effort estimation function (e.g., continuous or discontinuous), and also characteristics of the data set (e.g., outliers, collinearity; Shepperd & Kadoda, 2001). This suggests that in many cases we are faced with having to use different techniques to estimate effort and consequently to compare their prediction accuracy in order to find out which one presents the best accuracy for the data set employed in the evaluation.

The aim of this chapter, therefore, is to help answer the following question:

*How do we compare effort estimation techniques in order to find out which one provides the best estimation accuracy, given the data set employed?*

Before explaining how such a comparison can be carried out, we will present a survey of previous studies in Web effort estimation that have compared different techniques. This is done so that the reader is aware of the techniques that have been used and the one, whenever applicable, that provided the best results for that particular data set. This survey is a subset of the survey presented in Chapter II and the motivation for including this subset here is so that readers who have not previously read Chapter II will also be informed about the results from previous studies.

Survey of Web Effort Estimation Studies that Compared Different Techniques

This section presents the results from previous studies in Web effort estimation that compared different effort estimation techniques. Each work is described and summarised in Table 1. Studies will be presented in chronological order.

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