Chapter I
Sizing Web Applications for Web Effort Estimation

Emilia Mendes
The University of Auckland, New Zealand

ABSTRACT

Surveying and classifying previous work on a particular field brings several benefits, which are: 1) to help organise a given body of knowledge; 2) to provide results that can help identify gaps that need to be filled; 3) to provide a categorisation that can also be applied or adapted to other surveys; and 4) to provide a classification and summary of results that may benefit practitioners and researchers who wish to carry out meta-analyses. This chapter presents a survey literature of size measures (attributes) that have been proposed for Web effort estimation. These measures are classified according to a proposed taxonomy. We also discuss ways in which Web companies can devise their own size measures.

INTRODUCTION

The purpose of estimating effort is to predict the necessary amount of labour units to accomplish a given task, based on knowledge of previous similar projects and other project characteristics that are believed to be related to effort. Project characteristics are the input, and effort is the output we wish to predict.

A task to be estimated can be as simple as developing a single function (e.g., creating a Web form with 10 fields) or as complex as developing a large application, and the one input always found to have the strongest influence on effort is size. Thus, using an adequate size measure is fundamental to building adequate and accurate effort estimation models.

One of the main challenges in Web effort estimation is to determine what is/are the best measure(s) to be used to size an application. There are no standards and throughout industry and academia different size measures are used.

Since 1998, numerous size measures have been proposed for Web effort estimation and it is important that such body of knowledge be structured and made available such that practitioners may look at existing measures and assess whether or not they are applicable to their own environ-
Sizing Web Applications for Web Effort Estimation

ment; in addition, researchers may use this body of knowledge as a starting point to understand trends in sizing Web applications.

The literature to date has published three surveys on Web measures (Calero, Ruiz, & Piattini, 2004; Dhyani, Ng, & Bhowmick, 2002; Mendes, Counsell, & Mosley, 2005). Of these, only Mendes et al. (2005) has included measures that are applicable for Web effort estimation.

Each survey is briefly described below:

- Dhyani et al. (2002) concentrates on measures that belong to one of the following six categories:
  - **Web graph properties**: measures that quantify structural properties of the Web on both macroscopic and microscopic scales.
  - **Web page significance**: measures used to assess candidate pages in response to a search query and have a bearing on the quality of search and retrieval on the Web.
  - **Usage characterization**: measures that quantify user behavior aiming at improving the content, organization, and presentation of Web sites.
  - **Web page similarity**: measures that quantify the extent of association between Web pages.
  - **Web page search and retrieval**: measures for evaluating and comparing the performance of Web search and retrieval services.
  - **Information theoretic**: measures that capture properties related to information needs, production, and consumption.

- Mendes et al. (2005) provides a survey and taxonomy of hypermedia and Web size measures based on literature published since 1992. The criteria they used to classify measures will be detailed in the next section because this is the same criteria we use in this chapter. A taxonomy represents a model that is used to classify and understand a body of knowledge.

This chapter’s objectives are twofold: first, to complement Mendes et al.’s work by focusing further on size measures for Web effort estimation. We employ the same taxonomy proposed in Mendes et al. (2005) to classify the existing body of knowledge; second, to make recommendations to Web companies on how to define their own size measures, whenever that seems applicable.

The remainder of this chapter is organised as follows: First, it introduces the taxonomy we employ, explaining terms and definitions that are part of this classification. Second, it presents our