IRM PRESS

701 E. Chocolate Avenue, Hershey PA 17033-1117, USA
Tel: 717/533-8845; Fax 717/533-8661; URL-http://www.irm-press.com

ITB9321

Chapter VIII

A Quantitative Risk Assessment Model for the Management of Software Projects

Dan Shoemaker
University of Detroit Mercy, USA

ABSTRACT

This chapter presents a comprehensive quantitative management model for information technology (IT). It is assessment based and can be easily implemented without imposing an unacceptable organizational-change solution. It supplies detailed information about the functioning of processes, which will allow managers to both effectively oversee operations, as well as assess their prospective and ongoing risks of execution.

INTRODUCTION

The first point that must be understood is that quantitative management is not process improvement. The professional consensus is that the proper role of quantitative management is to insure the stability of software processes (Paulk, 1999). According to Paulk (1999), quantification makes the process “repeatable.” That is a critical requirement because an organization that does not embody repeatable outcomes cannot adequately gauge its effort and cannot estimate the time or cost of its products (Humphrey & Watts, 1994). With repeatable processes, the organization can plan its work and monitor its projects. Thus, according to Paulk (2000), quantifying an undefined and ad-hoc process leads to decreased cost of production. More importantly, quality cost, and schedule are predictable (Humphrey & Watts, 1994).

Quantitative management fulfills two fundamental requirements of IT governance’s best practice: the necessity to foster common understanding of the process and the responsibility to evaluate performance. Embodied within a strategic infrastructure it lets an organization “strategically align” its IT processes with its business goals, as well as to evaluate and economically justify each of its projects on a risk-adjusted basis. This assures that the overall mix of projects will best utilize the company’s resources and special abilities.

THE PROBLEM

Because it supports the execution of stable repeatable processes, quantitative management looks like the best answer to any concern about efficient operation. The problem lies in its consistent application. When IT processes are not implemented or measured as consistently as they should be, an element of unacceptable variability is induced. This is the most common complaint when arguing that quantitative management cannot be applied to software (Ould, 1996). In fact, according to Ould (1996), the only significant roadblock to an organization achieving a quantitative management capability lies in insuring reliable communication: “It is crucial to have a fully defined process and understand the context of the data when doing cross-project comparisons.” Thus, according to Ould (1996), businesses interested in implementing a successful quantitative management capability must concentrate on four “understanding” factors:

1. Universally understood and accepted operational definitions;
2. Clear and unambiguous (business) contextual definitions and associations;
3. The ability to trace from data back to that original context;
4. Consistent measurement of stable well-defined organizational variables.

So a single practical control framework is an absolute necessity. That is because definition entails the consistent identification of the elements that constitute the entity under study (ISACA, 2000). The problem with IT is that most of its operational variables are intangible, continuously changing or widely dispersed. For instance, the range of capital assets that should be accounted for in an ordinary IT operation span the gamut from facilities, personnel, hardware/system assets, software applications