



The Probability of Success

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What are the chances of completing this project on time? What are the chances of completing this project at cost? These are extremely intriguing questions. Being able to answer them would provide project managers with very significant information. Knowing the answers, project managers would have a greater likelihood of responding appropriately to their project's status. This article discusses the concepts underlying the computation of the project performance probabilities. The statistical methods applied to the earned value indicators for cost and schedule performance are explained. The resultant of the application is a graphic intended for management presentation, which has been termed a Performance Window. This article is intended for project managers and their earned value performance analysts. The article will be more meaningful to those having an understanding of Earned Value Management. An understanding of statistics will be helpful, but is not absolutely necessary.

Approximately 15 years ago, both private and public organizations were trying desperately to improve their product quality. The U.S. government and its industries felt significant pressure from Japan's success in improved product quality. The U.S. automotive industry was in serious financial trouble. Everyone went to classes to learn about Dr. W. Edwards Deming and Statistical Process Control (SPC). Total Quality Management was in vogue.

In reaction to this concentration on quality, the country experienced a quality revolution. This, in turn, spawned more refined quality efforts such as the Software Engineering Institute's (SEI) model for software process improvement [1] and the

Six Sigma program developed by Motorola [2]. Regardless of the refinement, the foundation of quality understanding was the same: Statistical Process Control, the creation of Walter Shewhart about 75 years ago [3].

In the Software Division's efforts to improve software development process efficiency and product quality, the SEI model cited previously was used. Over several years of improvement efforts, our division integrated the use of two management methodologies, Earned Value Management (EVM) and SPC. During this period of time, we developed several extensions and applications that can be used by a project manager in the following ways:

- Anomalous performance identification [4].
- Project result prediction [4].
- Project/risk planning from historical data [4, 5].
- Measurement of process improvement [4, 5].
- Management reaction to project status [6].
- Preparation of a project recovery strategy [6].

Due to space constraints, CrosSTalk was not able to publish this article in its entirety. However, it can be viewed in this month's issue on our Web site at <www.stsc.hill.af.mil/crosstalk> along with back issues of CrosSTalk.