Chapter V

User Participation in the Quality Assurance of Requirements Specifications: An Evaluation of Traditional Models and Animated Systems Engineering Techniques

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Abstract

Improper specification of systems requirements has thwarted many splendid efforts to deliver high-quality information systems. Scholars have linked this problem to, between others, poor communication among systems developers and users at this stage of systems development. Some believe that specifying requirements is the most important and the most difficult activity in systems development. However, limitations in human information processing capabilities and the inadequacy of the structures available for
communicating specifications and obtaining feedback and validation help to exacerbate the difficulty. This chapter presents an overview of both longstanding and newer requirements specification models and evaluates their capability to advance user participation in this process and incorporate stated quality attributes. It also reports on preliminary evaluations of animated system engineering (ASE), the author’s preferred (newer) technique, which indicate that it has the capability to improve the specification effectiveness.

Introduction

It is estimated that between 30% and 80% of software projects fail (Dorsey, 2003; Standish Group, 1994), depending on whether the basis is budgets or number of projects. Many of these software projects fail because of their inability to adequately specify and eventually meet customer requirements (Zave & Jackson, 1997). The following quotation from The Standish Group (1994) provides an excellent summary of the situation and puts the problem in perspective:

*In the United States, we spend more than $250 billion each year on IT application development of approximately 175,000 projects. The average cost of a development project for a large company is $2,322,000; for a medium company, it is $1,331,000; and for a small company, it is $434,000. A great many of these projects will fail. Software development projects are in chaos, and we can no longer imitate the three monkeys — hear no failures, see no failures, speak no failures.*

*The Standish Group research shows a staggering 31.1% of projects will be cancelled before they ever get completed. Further results indicate 52.7% of projects will cost 189% of their original estimates. The cost of these failures and overruns are just the tip of the proverbial iceberg. The lost opportunity costs are not measurable, but could easily be in the trillions of dollars. One just has to look to the City of Denver to realize the extent of this problem. The failure to produce reliable software to handle baggage at the new Denver airport is costing the city $1.1 million per day.*

*Based on this research, The Standish Group estimates that in 1995 American companies and government agencies will spend $81 billion for canceled
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