

# From Requirements to Release Criteria: Specifying, Monitoring, and Demonstrating Product Quality

Erik Simmons  
Intel Corporation  
Erik.Simmons@intel.com

## Abstract

*Specifying quality requirements is an excellent first step to predictable, managed product quality, but it is just the beginning. Quality specification, quality planning, data generation, quality monitoring, and quality reporting all work together to ensure that quality levels are known throughout the project. Quality release criteria are a good way to ensure that product quality drives interim milestone releases and the final product release. Requirements and release criteria are mutually influential, and quantified requirements are an essential part of this process.*

## 1. Introduction

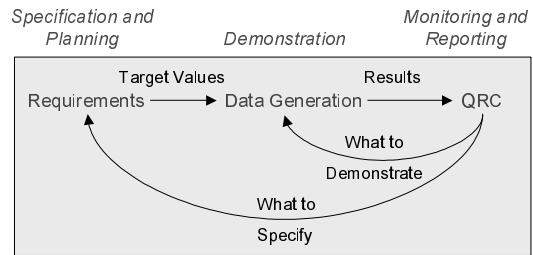
Without good planning and monitoring, product quality is a matter of chance. Numerous teams have launched products only to find out that required qualities were missing or inadequate, leading to expensive and embarrassing retrofits, product recall, or outright product failure in the marketplace. In order to prevent such mishaps, a product development team must perform several activities: Quality specification, quality planning, data generation, quality monitoring, and quality reporting. To aid product development teams in this process, Intel has developed a robust system that helps ensure end-product quality in components, software, boards, and systems.

## 2. Quality Release Criteria and Requirements

Software Quality Release Criteria (QRC) were recently added to Intel's product qualification system to assess and monitor the risk to interim software milestone releases and the final product release. The QRC cover a diverse set of quality attributes for a product. Many of the criteria are related to product requirements. Others are related to SQA, test, software configuration management, or project management data.

There are currently 75 QRC, grouped within 16 assessments to make quality reporting and quality monitoring simpler. A different group of assessments is applied to the alpha, beta, and gold milestones. Example assessments include Defect Tracking, Performance Testing, Customer Documentation, Product Reproducibility, and Continuous Operation.

Though some QRC do not come directly from requirements, there is a general bi-directional relationship between requirements and release criteria as shown in figure 1.



**Figure 1: Relationship between requirements and QRC**

Requirements engineering at Intel utilizes best practices from many sources. The most successful of these practices is Tom Gilb's Planguage, which is used to quantify qualitative requirements and product success criteria. The requirements indicate the quantified target values to be demonstrated, and the QRC influence what is specified in requirements. In this way, requirements and release criteria work in concert to help ensure that product quality is not a matter of chance. This risk-driven, data-driven approach gets problems out in the open early, while there is still time to correct them, and prevents omissions.