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Back to Basics: Redefining Quality Measurement for Hybrid Software Development Organizations

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Abstract : As the software industry transitions from a license-based model to a subscription-based Software-as-a-Service (SaaS) model, many software development groups are using a hybrid development model that incorporates Agile and Waterfall methodologies in different parts of the organization. The traditional metrics used for measuring software quality in Waterfall or Agile paradigms do not apply to this new hybrid methodology. In addition, to respond to higher quality demands from customers and to gain a competitive advantage in the market, many companies are starting to prioritize quality as a strategic differentiator. As a result, quality metrics are included in the decision-making activities all the way up to the executive level, including board of director reviews. This paper presents key challenges associated with measuring software quality in organizations using the hybrid development model. We introduce a framework called Prevention-Inspection-Evaluation-Removal (PIER) to provide a comprehensive metric definition for hybrid organizations. The framework includes quality measurements, quality enforcement, and quality decision points at different organizational levels and project milestones. The metrics framework defined in this paper is being used for all Cisco systems products used in customer premises. We present several field metrics for one product portfolio (enterprise networking) to show the effectiveness of the proposed measurement system. As the results show, this metrics framework has significantly improved in-process defect management as well as field quality.

Keywords : quality management system, quality metrics framework, quality metrics, agile, waterfall, hybrid development system
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