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Applying quality award criteria in R&D project assessment

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Abstract

Due to the problematic characteristics and complexity of R&D, the applicability of Total Quality Management (TQM) and quality award criteria in the assessment of a company's R&D process is very challenging. This study concentrates especially on the application of the Malcolm Baldrige Quality Award (MBQA) Criteria to R&D assessments at project level.

The applicability of quality award criteria in the assessment of R&D projects is first discussed with the help of a literature review at conceptual level. The meaning of different sub-areas of quality award criteria is analyzed from the point of view of R&D activities and single projects. The measures, performance criteria and concrete measurable aspects for R&D project evaluation are then derived on the basis of the analysis. In the empirical part of the study, the analysis of the utilization of criteria for R&D project assessment is discussed from the viewpoint of a manufacturing company that has successfully applied the Finnish National Quality Award Criteria based on the MBQA. The study gives examples of the derivation of new R&D project measures from the quality award criteria framework.

Keywords: Total quality management (TQM); Quality award criteria; Self-assessment; R&D projects; Performance evaluation

1. Introduction

An important consequence of the introduction of systematic approaches of quality management, e.g. quality awards, is the increasingly widespread use of their models and criteria for company self-assessment. Several similar types of national criteria are used for assessment, e.g. the Malcolm Baldrige Quality Award Criteria, the European Foundation for Quality Management (EFQM)-model, the Deming Prize and the Finnish National Quality Award Criteria. This study concentrates on application of Finnish criteria to R&D project assessments. The Finnish Criteria were formerly based on the MBQA, but from the year 2001 they are based on the EFQM-model. The framework utilized in this study is based on the MBQA.

In a number of earlier studies, the Total Quality Management (TQM) philosophy has been argued to be an applicable approach also for the management of R&D. However, due to the problematic characteristics and complexity of R&D, the application of quality award criteria in the assessment of a company's R&D process is very challenging (see e.g. Bellary and Murthy, 1999; Boyer, 1991; Fisher and Heywood, 1992; Kiella

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and Golhar, 1997; Lovett, 1992; Patino, 1997). Companies have different types of R&D projects and in addition to the process level, suitable performance criteria are needed also at the project level. There is a need in many organizations to bring the criteria also to project-level assessment in order to effectively control and manage different types of single R&D projects and the whole project portfolio.

The proposed systematic analysis approach of this study has several phases. First, the application of quality award criteria in the assessment and evaluation of R&D projects is discussed with the help of a literature review at conceptual level in order to identify the possibilities and potential problems involved. The meaning of different sub-areas of quality award criteria is analyzed from the point of view of R&D activities and single projects. The measures, performance criteria and concrete measurable aspects for R&D project evaluation are then derived on the basis of the analysis. In the empirical part of the study, the analysis of the applicability of derived measures for R&D project evaluation is discussed from the viewpoint of a manufacturing company that has successfully applied the Finnish National Quality Award Criteria.

The main goal of the study is to promote effective R&D management by utilizing a systematic analysis approach based on the Quality Award Criteria framework in order to achieve better understanding of the meaning of each sub-area of the framework to the assessment of R&D as a whole and at the project level, as well as to propose new measurement subjects and evaluation methods or concrete measures for R&D projects. In order to evaluate the validity of the derivation results of the analysis approach and to fine-tune the results, the derived measurement subjects and potential R&D project measures are compared with the development needs of the R&D performance measurement in a case company.

The systematic analysis approach provides new insights for companies to improve the performance of their R&D through the effective use of a quality award criteria framework. Generally, the results of the study promote the communication of criteria to the project level and taking different aspects of the sub-areas of quality award criteria more strongly into account in systematic R&D project-level evaluation in different organizations. The study also gives examples of derivation of new R&D project metrics from the quality award criteria framework and comparison of the metrics in the light of the development needs of R&D performance measurement in a case company.

2. Quality management in R&D: A brief overview

The quality of the R&D process is one of the critical success factors influencing the performance and success of a company's R&D activities. According to a study by Cooper (1998), a high quality new product process is the strongest common denominator among high performance businesses. The effective management of R&D requires appropriate metrics for assessing the quality of the process.

The principles of quality management have been applied in R&D management in several organizations, and their applicability has been reported in a number of earlier studies (e.g. Bellary and Murthy, 1999; Boyer, 1991; Fisher and Heywood, 1992; Kiella and Golhar, 1997; Lovett, 1992; Patino, 1997). Due to the nature of R&D activities—e.g. insecurity related to planning and decision-making, assessment of the contribution of R&D to profits, long time lag, creative personnel, coordination and control etc.—there are barriers hindering the effective use of these principles.

2.1. Quality management practices in R&D—theoretical considerations from previous studies

Total Quality Management (TQM) can be defined as follows: 'A business improvement philosophy which comprehensively and continuously involves all of an organization's functions in improvement activities' (Rosenau et al., 1996). TQM is an approach for improving the competitiveness, effectiveness and flexibility of a whole organization. It is essentially a way of planning, organizing and understanding each activity, and depends on each individual at each level (Oakland, 1993). The implications emerging from the total