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Product life cycle cost analysis: the impact of customer profiling, competitive advantage, and quality of IS information

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Abstract

Life cycle cost analysis is considered in the literature to be of increasing importance to firms as international competition intensifies and technological change continues. The literature increasingly emphasizes that rapid technological change and shortened life cycles have made product life cycle cost analysis critical to organizations. Although significant benefits are attributed to life cycle cost analysis, there is little evidence regarding the extent of its application in organizational settings. Moreover, there is scant systematic evidence available with respect to the array of factors that may influence its use. However, a review of the literature suggests that customer profiling, competitive advantage, and quality of information system information are three factors potentially impacting the extent to which life cycle cost analysis is used in firms. The results of the study illustrate first, the degree to which product life cycle cost analysis is used across a random sample of organizations. Second, that all three independent variables play a positive role in affecting the extent to which product life cycle costing is used in firms.

Keywords: Product life cycle; Customer profiling; Competitive advantage; Quality of IS information

1. Introduction

Literature reports suggest that life cycle cost analysis is of increasing importance to firms as international competition intensifies and technological change continues. Paying attention to product life cycle costs is expected to enable organizations first, to assess better the effectiveness of planning by comparing actual with budgeted life cycle costs as well as the distribution of those costs (Clinton and Graves, 1999), and second, to enhance their capacity to make better pricing decisions (Adamany and Gonsalves, 1994). Third, to improve the assessment of product profitability (Hansen and Mowen, 1992), and fourth, to

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aid in the design of more environmentally desirable products (Kreuze and Newell, 1994; Madu et al., 2002). Fifth, life cycle cost analysis is argued to facilitate an understanding of the environmental impact of products from development through manufacture, distribution, customer use, disposal and potential recycling (Sutton, 1992; Weitz et al., 1994; Brady et al., 1999). Sixth, to focus on post-sale factors that have become a larger percentage of life cycle costs, including warranty, cost of parts, service and maintenance, as well as being increasingly important to customers in their purchasing decisions (Shields and Young, 1991; Murthy and Blischke, 2000).

Life cycle costs comprise all costs attributable to a product from conception to those customers incur throughout the life of the product, including the costs of installation, operation, support, maintenance and disposal (Shields and Young, 1991; Shank and Govindarajan, 1992; Artto, 1994; Barfield et al., 1994; Foster and Gupta, 1994). For example, life cycle costs for a manufacturer include planning, design, testing, production, marketing, distribution, administration, service and warranty costs (Kaplan and Atkinson, 1989; Shields and Young, 1991; Artto, 1994), apart from those costs borne by the purchaser.

Few empirical reports chronicle the organizational utility of product life cycle cost analysis as factors influencing its use have not been a major focus of management accounting research. Life cycle cost analysis is a decision tool of growing organizational importance across a range of industries. What is absent, however, is an awareness of its use across firms, and second, an understanding of the factors that may drive its application. A review of the literature suggests that customer profiling, competitive advantage and quality of information system (IS) information may have a positive bearing on the extent to which life cycle cost analysis is employed by firms. Organizations that undertake customer profiling are likely to use life cycle cost analysis as a means of maintaining and enhancing customer focus (Hagel and Rayport, 1997; Murthy and Blischke, 2000). Competitive advantage, with its concentration on factors that differentiate a firm from others in the same product market, is also expected to result in the use of life cycle cost analysis (e.g. Flynn et al., 1995; Perera et al., 1997). Finally, quality of IS information's contribution to more effective decision making is likely to facilitate the application of product life cycle cost analysis.

The purpose of this study is to first, evaluate the extent to which product life cycle cost analysis is used in firms. Given the extensive claims for its utility, an assessment of the degree to which it is employed is overdue. Second, the paper empirically examines the impact of customer profiling, competitive advantage, and quality of IS information on product life cycle cost analysis use in firms. In doing so, this study is one of the first to investigate the use of life cycle cost analysis together with specific factors influencing its application in organizational settings.

The remainder of the paper is structured as follows. Section 2 reviews the literature leading to the development of the hypothesis. Section 3 describes the method taken in sample selection and variable measurement. Section 4 presents the results of the hypothesis test. Section 5 discusses the conclusions and considers potential limitations of the study.

2. Literature review and hypothesis development

The literature increasingly emphasizes that rapid technological change and shortened life cycles have made product life cycle cost analysis critical to organizations (e.g. Ray and Schlie, 1993; Barfield et al., 1994; Murthy and Blischke, 2000). Arguments point to the extensive benefits that should arise from its adoption (e.g. Hansen and Mowen, 1992; Brady et al., 1999; Dowlatshahi, 2001). For example, its