Bi-Objective Two-Stage Decision-Making Process for Service Marketing

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ABSTRACT

The authors propose a bi-objective two-stage decision-making process to help the marketing team of a company to determine which services make more profit. The decision is based on customer satisfaction measures which are related to the different company services. Thus, they constitute a multi-criteria assessment of the company's performances. The first stage of the authors' proposed process is to evaluate the services with respect to certain criteria using a stochastic multi-criteria acceptability analysis. Then, a bi-objective mathematical model is utilized to determine which services are more profitable. An analytical hierarchy process is applied to aggregate the bi-objective model. The applicability and validity of the proposed process is illustrated in a case study.

Keywords: *Analytical Hierarchy Process, Bi-Objective Mathematical Model, Decision-Making Process, Service Marketing, Stochastic Multi-Criteria Acceptability Analysis*

1. INTRODUCTION

Marketing has received extensive attention from both managers and academics in recent years. From a managerial viewpoint, top management increasingly calls for "marketing accountability" pressuring marketers to produce metrics that document marketing activities. From an academic perspective, the growing interest in marketing metrics can be attributable to five theoretical angles (Ambler, 2003). First, according to control theory suggesting the need for historical data on marketing programs as an essential segment of the cycle of analysis, planning, implementation and control (Jaworski, 1988; Kotler, 2003), marketing metrics were utilized to evaluate past performance to improve future strategy and execution. Second, with respect to agency theory focusing on the contract between principal and agent and the need for past data on the extent to which the principal's objectives have been met (Jensen & Meckling, 1976), marketing metrics could be used to facilitate the relationship between corporate and marketing management (Ambler et al., 2001). Third, marketing metrics are used to measure the various dimensions of intangible assets, reinforcing the broader

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quest for a balanced scorecard of performance (Kaplan & Norton, 1996) which emphasizes such intangible assets as brand equity, which account for a large and increasing proportion of shareholder value. Fourth, consistent with the literature on market orientation (Jaworski & Kohli, 1993; Narver & Slater, 1990) that argues for the need for market sensing and appropriate cross-functional responsiveness to the resulting data, marketing metrics are implemented as part of "marketing sensing." Finally, as marketing metrics become more widespread among firms, institutional theory (Meyer & Rowan, 1977) suggests that their use will become an institutional norm.

Operationally, the present study focuses on how firms use marketing metrics as tools for customer relationship management (CRM).

Gitomer (2001) points out that the most important factor affecting the success of CRM implementation is the participation of top management. Further, Fitzgerald and Brown (2001) suggest that the implementation of CRM needs to be managed by "executive committees" rather than a single executive. Although researchers have proposed that CEO involvement is critical to CRM implementation, they have not provided a recommended way for management to help the CRM implementation. Thus, the purpose of this article is to identify some success factors contributing to CRM implementation. The results from the present study could recommend ways in which executives can participate in and support their CRM implementation projects.

Stochastic multi-criteria acceptability analysis (SMAA) is a recently developed cluster of multiple-criteria decision-aiding (MCDA) approaches. Different SMAA methods can be employed to work with the three fundamental MCDA problems (Figueira et al., 2005): choosing, ranking, and sorting. The methodology considers these problems in a broader sense. The approach is based on an inverse analysis of the space of feasible parameter values. One of the advantages of SMAA over other MCDA methodologies is that it can be used without any preference information.

In decision making problems the information can be static or dynamic. In the dynamic state, the information is not perfect due to the changes which influence the information over time.. Dynamism can be categorized into three types: incompleteness, imprecision, and uncertainty (Smets, 1991). Incomplete information is where a value is missing. Imprecise information is where there is a value for the variable but without the required precision. Uncertainty is a form of dynamism which occurs when the observer is taken into account: the observer gives complete and precise information, but is itself unreliable. For information and references on approaches dealing with dynamism, see Stewart (2005). In some models, the decision-makers did not want to reveal their preference model, and therefore exact parameter values could not be obtained; in others, the alternatives had uncertain or imprecise values for criteria measurements. Therefore, new advances seem necessary to preserve the usefulness of the approach.

One way to overcome the weaknesses of the utility function-based approach is through an inverse method: instead of asking for parameter values and giving an answer to the problem in question, the values resulting in different outcomes are described. The inverse SMAA method includes computing multidimensional integrals over feasible parameter spaces in order to support decision-makers with descriptive measures. The method solves various problems encountered in the traditional approach allowing the use of parameters with dynamism in the values. For example, different weight elicitation techniques usually produce different values; therefore, deterministic weights are harder to justify than, for example, weight intervals.

The remainder of our work is organized as follows. Next we review the related literature. The problem is defined in the upcoming section. Afterwards, we model the problem in a two-stage process. Then we propose an analytical hierarchy process to aggregate the two objectives of the problem. The efficiency and validity of the proposed model are illustrated

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