Using Linguistic Decision-Making Method to Measure Service Quality Evaluation Problem

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Abstract. Measuring service quality is usually fuzzy because the service quality concerns human being’s subjective judgment. Consequently, customers’ subjective opinion can be described as triangular fuzzy number. This study presents a decision-making method to evaluate service quality by customer surveys. Based on the probability of fuzzy sets defined by Zadeh (1968), the membership function of triangular fuzzy number determined by each customer with respect to each evaluation item is first calculated, and the ratio of that on each service quality level can then be calculated. For each evaluation item, the degree of satisfaction for each service quality level can be obtained by summarizing all the ratios in the specific service quality level. Those calculated degrees of satisfactions can be the bases when making strategies of improving service quality. An empirical study of a computer-information company is conducted to illustrate the effectiveness of the presented approach. Results show that the overall satisfaction with the service-quality for the company-studied is pretty high, especial in the field of communication with customers.

Keywords: service quality, linguistic variable, triangular fuzzy number, fuzzy sets.

1. INTRODUCTION

The service quality is a very important management topic of a service organization. Good service quality is the competition strength for a service organization, since good service quality has the great effect on customer satisfaction and customer loyalty (Lin, 2009). Hence, in order to get competition edge, companies need to continuously improve service quality to differentiate their services from those of their competitors (Karimi et al. 2001, Caro and García, 2007, Kuo et al. 2007).

The service quality level can be measured by customer survey. However, service quality is very difficult to be described or be measured precisely or objectively owing to its intangibility, heterogeneity, and inseparability. Hence, a number of papers addressed the service quality evaluation problem (Lapierre et al. 1996). The major models for evaluating customer-perceived service quality is the PZB service model and SERVQUAL model by Parasuraman et al. (1985, 1988, 1991). The PZB service model analyzes the discrepancy between expected service and perceived service.

In SERVQUAL model, customers measuring service quality by a multi-item scale which groups the criteria into five dimensions: tangibles, reliability, responsiveness, assurance, and empathy.

Despite SERVQUAL has been widely applied in many service quality studies, it has been criticized by many other researchers (Teas 1994, Chien and Tsai 2000) due to customers’ expectation of service quality being difficult to be quantified. Further, using crisp data to express perceived service is unrealistic. In practice, in the process of evaluating service quality, crisp data cannot well describe the degree of customer’s perception owing to the fuzziness and subjective of service.

Fuzzy theory is an effective method for tackling fuzzy data. Zadeh (1965) first introduced the concept of fuzzy set theory. By fuzzy sets theory, when data described as linguistic variables can be presented by membership function. Dubois and Prade (1978, 1981) further presented the concept of fuzzy theory to make the application of membership function being more widely. Zimmermann (1996) presented that it is most proper by using fuzzy number to deal with the