

CONSTRUCTION AND ANALYSIS OF SERVICE QUALITY MODEL FOR BEIJING URBAN MASS TRANSIT

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Abstract: Mass transit systems have many advantages over private transit systems and the Beijing Municipal Commission of Transport aims to increase the mass transit as the commute mode to 45% to 2015. Public transit industry of Beijing is accordingly facing more and more strict challenge. Data show that the good service quality will influence positively on the attitude, emotion and behavior of customers, thus keeping high-level service quality can bring both economical and social effects for organization. There were a few attempts on constructing service quality model for Beijing urban mass transit but the paper argues to adopt a SEM in the construction.

1 INTRODUCTION

Mass transit or public transport refers to municipal or regional public shared transportation, such as buses, streetcars, and ferries, open to all on a nonreserved basis. Mass transit systems have many advantages over private transit systems such as offering considerable savings in labor, materials, and energy. When utilized to any reasonable fraction of their capacity, mass transit vehicles carry a far higher passenger load per unit of weight and volume than do private vehicles. Take Beijing as an example, mass transit will save nearly 90% road length, 80% fuel and reduce about 86%, 95% and 90% amount of exhaust emission of carbon monoxide (CO), hydrocarbon (HC) and nitric oxide (NO) respectively.

Accompanied with the sustained and rapid economic growth, Beijing as the representative metropolitan in China has to bear the great pressure of traffic congestion. In order to mitigate urban traffic congestion, Beijing has applied many policies such as develop public traffic, construct rail transit, implement bus priority and so on. These policies do have effects and according to the Beijing Municipal Commission of Transport, the latest statistics shows that mass transit accounts for 39.3% in the early half year of 2010 comparing 29.8% in 2005. But at the same time, with the urban motorization intensifying, private car ownership keep increasing, more and

more commuters change their commute mode to private cars, The percentages of car are from 29.8% to 34.2% correspondingly. The Beijing Municipal Commission of Transport aims to increase the mass transit as the commute mode to 45% to 2015. Public transit industry of Beijing is accordingly facing more and more strict challenge.

In the last two decades, practitioners and academics in the field of service marketing have noted that the good service quality will influence positively on the attitude, emotion and behavior of customers, thus keeping high-level service quality can bring both economical and social effects for organization. The importance of service quality has dramatically accelerated. Given the need to maintain high quality, researchers have devoted increasing efforts on how to measure quality but it also continues to be a challenging research theme. Mass transit is considered to be an essential public service. It is essential to construct a service quality model for Beijing urban mass transit.

2 SERVICE QUALITY MEASUREMENT

In the literature there are many techniques for measuring service quality and they can be identified in two different categories.

The first one includes methods of statistical analysis such as gap analysis, factor analysis, cluster analysis, and conjoint analysis. SERVQUAL or RATER and CSI are the most famous two among them. The second category of techniques consists in estimation of the coefficients by modeling. There are linear models, like multiple regression models, and non-linear models, like the structural equation model (SEM).

SERVQUAL or RATER is a multi-item scale of service quality. SERVQUAL was developed in the mid 1980s by Zeithaml, Parasuraman & Berry. It represents service quality as the discrepancy or gap between a customer's expectations for a service offering and the customer's perceptions of the service received, requiring respondents to answer questions about both their expectations and their perceptions. The use of perceived as opposed to actual service received makes the SERVQUAL measure an attitude measure that is related to, but not the same as, satisfaction. $Q=P-E$ (Q stands for perceived service quality, P refers to performance perception and E stands for performance expectation). SERVQUAL was originally measured on 10 aspects of service quality: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding the customer and tangibles. Parasuraman et. al. presented some revisions to the original SERVQUAL measure to remedy problems with high means and standard deviations found on some questions and to obtain a direct measure of the importance of each construct to the customer in 1991. This is the RATER: Reliability, Assurance, Tangibles, Empathy, and Responsiveness.

The Customer Satisfaction Index (CSI) is a weight average index, it based on the enterprise customer satisfaction index utilize the econometrics model to compute the trade customer satisfaction index, compute the industry customer satisfaction index by the trade customer satisfaction index, and then compute the country customer satisfaction index by the industry customer satisfaction index. Taking American Customer Satisfaction Index (ACSI) as a example, it is a scientific standard of customer satisfaction. Academic research has shown that the national ACSI score is a strong predictor of Gross Domestic Product (GDP) growth, and an even stronger predictor of Personal Consumption Expenditure (PCE) growth. On the microeconomic level, academic studies have shown that ACSI data is related to a firm's financial performance in terms

of return on investment (ROI), sales, long-term firm value (Tobin's q), cash flow, cash flow volatility, human capital performance, portfolio returns, debt financing, risk, and consumer spending. Increasing ACSI scores has been shown to predict loyalty, word-of-mouth recommendations, and purchase behavior. The ACSI measures customer satisfaction annually for more than 200 companies in 43 industries and 10 economic sectors. In addition to quarterly reports, the ACSI methodology can be applied to private sector companies and government agencies in order to improve loyalty and purchase intent.

In the second category, the models relate global service quality (dependent variable) to some attributes (independent variables). There is no unique approach to measuring service quality, but, it is accepted that the quality of service is usually a function of several particular quality attributes and determining of each factor weight is the important moment of measuring quality. For these reasons, it is important to identify service quality attributes and to establish their importance and influence on customer behavior.

3 APPLICATIONS OF THE SERVICE QUALITY MEASUREMENT IN THE MASS TRANSIT

There are some applications of the service quality measurement in the public service field. As far as the mass transit is concerned, measurement of the service quality is rather a new thing. The copyright form is located on the authors' reserved area.

1976, Allen & DiCesare discussed transit service evaluation and its application to medium-sized bus transit systems. They concluded that transit service can be quantified and evaluated but that considerable effort is necessary to achieve a comprehensive and equitable system. This is the earlier try to measure the service quality of mass transit. Silcock (1981) dealt with the problem of measuring the effectiveness of the running of a bus service along a particular route to a predetermined schedule and set of fares. Pullen (1993) concentrated on the definition and measurement components of quality management processes for local public transport services. After reviewing existing methods based on passengers' waiting times, lost mileage, expanded

sets of measures and indices, he concluded that a single measure is unlikely to encompass all aspects of quality of service. He defined a limited set of quality of service attributes and argued that both relevant performance measures and psychometric measures can be selected as indicators of the defined set of quality of service attributes.

In the 1950's, The United States planned to begin the National Household Travel Survey (NHTS) and it became into the National Household Transportation Survey (NHTS) later. It was funded by Federal Highway Administration and Bureau of Transportation Statistics and provides information to assist transportation planners and policy makers who need comprehensive data on travel and transportation patterns in the United States. Until 2009, the data reports included 2009 NHTS, 2001 NHTS and prior Nationwide Personal Transportation Surveys (NPTS) conducted in 1969, 1977, 1983, 1990, and 1995. The 1995 survey included new questions to measure the public's perceptions of, or satisfaction with, the nation's transportation system including their reactions to statements about mobility and congestion, perceived difficulties in travel and so on. This is the first time to conduct the service quality of the mass transit and it applied the CSI technique.

Reeti Agarwal (2008) used the survey method to find the factors related to Indian Railway services that have an impact on customer satisfaction. The major findings of the study depicted that out of the various factors considered, employee behavior has the maximum effect on satisfaction level of customers with Indian Railways as a whole.

In China, Shanghai develops the first CSI for taxi in the 1990's and Beijing conducted public's satisfaction with the urban transportation system in 2005. Guangzhou and Xi'an also explored these techniques. Wang Zeyuan et.al (2010) used grey relational assessment model to assess the urban public transport service quality.

4 CONCLUSIONS

As far as the author's know, there is little literature on measuring customer satisfaction and service quality in public transport using modeling. The earlier ones can be found were conducted by Hensher, David A et.al and Fazlina Waris et.al applied logistic regression analysis to measure the customers' perception towards electric commuter

train services in Malaysia.

But the traditional SERVQUAL and CSI techniques have shortcomings while applied in the mass transit field and it is necessary to construct service quality model for mass transit. This is just the literature review of the study, the author will continue to use Structural Equation Model (SEM) to construct and analyze the service quality of Beijing urban mass transit.

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