SERVAQUA: Towards a Customer Focused Model for Service Quality in Water Utilities

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INTRODUCTION

SERVAQUA is a model to measure customer perceptions of quality in tap water services. This model is based on Service-Dominant Logic, an influential marketing theory that describes the process of value creation.

Empirical research was conducted to confirm the validity of this model, which can be used as a standardised survey instrument to measure customer perceptions of service quality in water utilities.

This poster summarises the development of the SERVAQUA survey instrument to measure perceptions of service quality.

SERVAQUA is hypothesized to consist of two dimensions:

Technical Quality measures the outcome of the core service—what service is provided? Technical Quality relates to the customer experience of using tap water through its pressure, quality, taste and so on.

Functional Quality is a measure of the process of service delivery—how is the service provided? Functional Quality relates to the supplementary services: billing, customer service, complaints handling and so on.

METHODS

Interviews with advocacy groups and regulators in Australia were conducted to develop a questionnaire to measure customer's perception of quality.

The questionnaire consists of 18 items, the first five of which measure the Technical Quality and the remaining items relate to the Functional Quality. Technical Quality items (t1–t5) related to issues such as pressure and quality, while Functional Quality items (f1–f13) addressed customer service, billing, employee behaviour and so on.

Customers in Australia and the United States were asked to complete the questionnaire. Quality perceptions were assessed using a seven-point Likert scale. Customers were also asked to comment on their experiences with tap water.

Numerical data was analysed using psychometric statistical techniques and corroborated with the associated qualitative responses. Factor Analysis was used to assess the hypothesised model. Sentiment Analysis was used to test the validity of the responses.

RESULTS

A total of 1191 responses were received. After data cleaning and imputation, 832 responses were used for the analysis. 516 respondents also provided qualitative information about their experience with tap water services.

The results of all items were heavily positively skewed, as customers almost unanimously rated the level of technical service very highly. Functional Quality items showed a higher variability than Technical Quality.

Exploratory factor analysis over all items suggested a two-factor solution. Cross-loading items were removed, yielding a more parsimonious model (Cronbach-α=0.92). Confirmatory factor analysis revealed a medium to high fit between the data and the hypothesis (Figure 1).

The final model was tested for validity. Functional Quality (PA1) and Technical Quality (PA2) strongly correlate with each other (r=0.5, p<0.001). This correlation confirms theoretical expectations about service quality and validates the ServAqua model.

Qualitative comments were assessed for the sentiment they express (positive, neutral or negative). A Kruskal-Wallis Test showed that there was a statistically significant difference between the numerical scores by sentiment (H(2)=16.6, p<0.01). People with negative sentiments generally provided a lower score on the numerical quality scale. This relationship also confirms the validity of the ServAqua model.
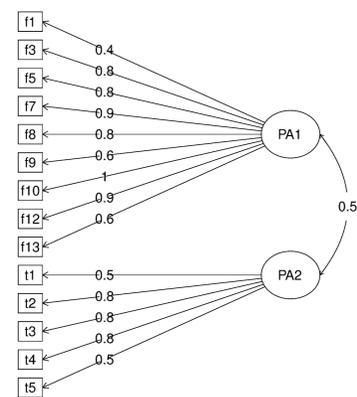
n=397

n=435

Figure 1 – Confirmatory Factor Analysis results.

DISCUSSION

In water utility management, quality is most commonly defined from the perspective of the professional. Water quality is a specialized profession that relies on complex instrumentation and analysis.

Service-Dominant Logic holds that quality is "always uniquely and phenomenologically determined by the beneficiary", i.e. by the customer. SERVAQUA is based on this logic and defines quality from the consumer's perspective through a psychometrically validated survey instrument.

While the scientific approach used by the water utility relates to *safe water*, the customer's perspective of quality relates to *good water*. Both the intrinsic perspective of the professional and the extrinsic perspective of the consumer need to be in balance.

The professional's perspective of water quality is product-based and is expressed as 'widgets' meeting specifications. The customer's perspective of water quality is experience-based and is expressed in 'Moments of Truth'.

Safe water is a necessary condition of customer satisfaction, but not a sufficient condition. Both perspectives need to be understood to provide a complete view of service quality.

Benchmarking methodologies in water are mostly highly intrinsically focused and SERVAQUA enhances these methods by providing a customer-focused method for service quality measurement.

The strong correlation between Technical and Functional Quality indicates that acceptable Technical Quality is a prerequisite for successful Functional Quality. Customers that do not need to spend time contacting the utility to report service failures also rate the level of Functional Quality high.

The relationship between the two dimensions is bidirectional. Temporary low levels of Technical Quality can be forgiven by customers if the Functional Quality is of a high level.

The ServAqua survey instrument can assist water utilities in analysing the perceptions of their customers and then influence these perceptions to improve performance.

CONCLUSIONS

The empirical research confirmed the hypothesised two-dimensional SERVAQUA model for service quality in tap water services.

From a practical perspective, this model provides a standardised way for water utilities to measure customer perceptions.

From a theoretical perspective, this research contributes to knowledge about quality in a Service-Dominant Logic context.

Go to *invisiblewater.org* for more detailed information about this research and other ideas about customer service for water utilities.

The *Invisible Water Utility* is a research project about customer satisfaction engineering in water utilities.

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