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# **Measurement of passengers service quality in public transportation: servqual analysis**

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## MEASUREMENT OF PASSENGERS SERVICE QUALITY IN PUBLIC TRANSPORTATION: SERVQUAL ANALYSIS

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### Introduction

Transport plays an important role in the economic development of the country by creating employment opportunities and sustaining economic activities. Transport is the channel of social and economic interaction involving the physical movement of people and goods. The quest for service quality has been an essential strategic component for service firms like buses attempting to succeed and survive in today's competitive environment. The SERVQUAL model focuses on the difficulty in ensuring a high quality of service for all customers in all situations. SERVQUAL methodology is an analytical approach for evaluating the difference between customers' expectations and perceptions of quality.

### Objective

The objective of this research is to measure the quality of the factors affecting the current service delivery of the State Road Transport Undertakings (SRTUs) in Tamil Nadu with the SERVQUAL instrument. Balancing customers' expectations and perceptions and closing the gap between them, are essential if a company is to provide high-quality services.

### Model of Service Quality Gaps

In the SERVQUAL method quality could be viewed as the gap between perceived service and expected service and called as gap theory. In the gap theory of service quality, that is,  $Q=P-E$  (Quality equals perceptions – Expectations). SERVQUAL is based on the “GAP model” of service quality which facilitates quantification of the gap between customers' expectations of a service and their perceptions of the actual service delivered.

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### **Dimensions of quality**

There are five dimensions of quality: tangibles, reliability, responsiveness, assurance and empathy. This scale has been developed for the service sector and has five generic dimensions or factors:

1. Tangibles : Physical facilities, equipment and appearance of personnel;
2. Reliability : Ability to perform the promised service dependably and accurately;
3. Responsiveness : Willingness to help customers and provide prompt service;
4. Assurance : (including competence, courtesy, credibility and security): Knowledge and courtesy of employees and their ability to inspire trust and confidence;
5. Empathy : (including access, communication, understanding the customer): Caring and individualized attention that the firm provides its customers.

These five dimensions are found relevant for various business services. Customers will use all or some of the dimensions to determine service quality perceptions.

### **Sampling method and size**

In this research, convenience sampling was used. The reason for this selection is that there is no available sampling frame i.e. a list of all members of the population.

Based on advice on sample size for a given population size by Sekaran (2003: 294)<sup>1</sup>, the sample size should be from 380 to 384 if the given population is over 40,000. Due to the number of passengers in Tamil Nadu being very large (approximately 2 crores), the sample size of the study was 500.

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<sup>1</sup> Sekaran, U (2003) Research Methods for Business (4<sup>th</sup> Edition). Hoboken , NJ: John Wiley & Sons.

### **Data collection**

All the data were collected from 500 passengers who alighted and entered in buses of SRTUs at a specific place, the “Mattuthavani Integrated Bus Stand” in Madurai City, Tamil Nadu. This venue is suitable for selection as passengers from other towns and cities enter and leave at this place. Data have been collected from January 1, 2011 to February 27, 2011. These collected data were analysed to identify the critical factors in the service delivery process of the SRTUs in Tamil Nadu.

### **Questionnaire**

A questionnaire was used in this research. It consists of fifty questions from the modified version of SERVQUAL (Zeithaml and Bitner, 2000: 41)<sup>2</sup> instrument (the same 25 questions were used to assess expectations and perceptions).

The questionnaire was divided into three parts. The first part of the questionnaire consisted of two demographic questions (Gender and Age). The second part was designed to measure the respondents' expectations regarding service quality in the SRTUs in Tamil Nadu. The third part of the questionnaire was designed to examine the respondents' perceptions of service quality actually provided by SRTUs in Tamil Nadu.

The five-point Likert scale is the most widely used form of scaled items where the respondent chooses a point on a scale that best represents his/her view. Scoring for the scale was follows: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree.

By comparing each value difference between all 25 expectations and perceptions, the level of quality can be concluded. For example, if the perception value is higher than the expectation value, it can be concluded that the service is satisfactory or ideal. However, if the expectation value is lower than the perception value, the service quality level can be regarded as unsatisfactory or even unacceptable.

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<sup>2</sup> Zeithaml, Valarie A. and Mary Jo Bitner (2000), "Services Marketing," New York: McGraw Hill, second edition. ISBN 0-07-1169946

### Data Analysis

The total number of respondents who participated in our survey was 500

**Gender:** 43.6% (218) were female and 56.4% (282) were male.

**Age:** The age distribution of respondents ranged from 21 to 65 years (44 years being the difference between the maximum and the minimum age). The break up of the ages of the respondents was given in the following Table.

**Table 1**

**Age Distribution of Respondents**

Age	Respondents
Below 20	Nil
21-30	84
31-40	218
41-50	127
51-60	47
Above 60	24

### Comprehensive Statistics of Statements

The research on measuring service quality has focused primarily on meeting or exceeding customers' expectations. The following sections are comprehensive statistics of the original 25 statements with reference to passenger service.

#### Statement 1: The bus stand is attractive

The data reflected in Table 2.1 reveal the expectations and perceptions of respondents in this study in terms of the attractiveness of bus stands.

**Table 2.1**

Score	Expectation Responses	Perception Responses
Strongly Disagree	66	49
Disagree	75	70
Undecided	135	180
Agree	170	150
Strongly Agree	54	51
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 2: Bus companies are equipped with modern technology**

The aim of statement 2 is to gain the customers' perceptions of the modernity of those bus companies' equipment.

**Table 2.2**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	52	74
Disagree	78	75
Undecided	159	140
Agree	115	110
Strongly Agree	96	101
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 3: The bus stand has adequate resource and capacity**

The aim of statement 3 is to determine the customer's perceptions of the physical resources.

**Table 2.3**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	19	71
Disagree	70	30
Undecided	161	160
Agree	130	54
Strongly Agree	120	185
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 4: Bus companies have a professional appearance**

Statement 4 aims to assess the appearance of these SRTUs that provide service to their customers.

**Table 2.4**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	31	29
Disagree	60	60
Undecided	140	150
Agree	49	61
Strongly Agree	220	200
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 5: The dress of staff is neat and smart**

Statement 5 aims the assessment of the neat appearance of employees.

**Table 2.5**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	19	26
Disagree	70	60
Undecided	151	140
Agree	60	79
Strongly Agree	200	195
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 6: The bus always arrives at the destination on time**

The response to statement 6 indicates that the SRTUs lead in terms of the fulfillment of promises of punctuality.

**Table 2.6**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	21	21
Disagree	60	60
Undecided	125	160
Agree	90	75
Strongly Agree	204	184
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 7: The bus never breaks down on the road\**

The data, as reflected in Table 2.7, reveal the expectations and perceptions of respondents in terms of the fault indicator of buses.

**Table 2.7**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	19	27
Disagree	60	60
Undecided	135	135
Agree	60	65
Strongly Agree	226	213
<b>Total</b>	<b>500</b>	<b>500</b>



**Statement 8: Customers can easily book a ticket for their journey.**

Statement 8 aims to determine whether customers can easily book a ticket for their journey.

**Table 2.8**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	28	26
Disagree	60	75
Undecided	125	135
Agree	60	60
Strongly Agree	227	204
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 9: Staff satisfy customers' requests right the first time**

**Table 2.9**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	29	28
Disagree	60	60
Undecided	135	135
Agree	61	60
Strongly Agree	215	217
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 10: The timetable in the bus stand is error-free.**

The purpose of statement 10 is to assess the veracity of the timetable in the bus stand.

**Table 2.10**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	27	26
Disagree	60	60
Undecided	90	140
Agree	110	60
Strongly Agree	213	214
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 11: Bus companies always inform people of change of timetable and prices in advance.**

Statement 11 aims to assess whether SRTUs can show a sincere interest in problem-solving.

**Table 2.11**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	29	25
Disagree	60	61
Undecided	126	125
Agree	60	64
Strongly Agree	225	225
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 12: Bus companies can provide timely and efficient service.**

Statement 12 aims to determine whether prompt service is provided.

**Table 2.12**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	29	25
Disagree	60	64
Undecided	125	126
Agree	60	50
Strongly Agree	226	235
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 13: Communication with customers is clear and helpful**

The data in Table 2.13 reveal the expectations and perceptions of respondents in this project in terms of the technique of using words effectively while staff dealt with customers.

**Table 2.13**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	26	23
Disagree	60	60
Undecided	151	137
Agree	60	60
Strongly Agree	203	220
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 14: Staff are always willing to help customers**

Table 2.14 reveals the expectations and perceptions of respondents in this project in terms of responsiveness of staff.

**Table 2.14**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	25	25
Disagree	64	63
Undecided	125	135
Agree	51	52
Strongly Agree	235	225
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 15: Staff can provide complete answers when they attend to customers' requests.**

The aim of statement 15 is further estimate the influence of the knowledge and enthusiasm of staff.

**Table 2.15**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	25	29
Disagree	63	60
Undecided	115	91
Agree	52	75
Strongly Agree	245	245
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 16: Customers feel safe in their transactions with staff in the bus stand.**

The purpose of statement 16 is to determine the security in the bus stand.

**Table 2.16**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	27	25
Disagree	60	90
Undecided	142	110
Agree	51	51
Strongly Agree	220	224
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 17: Customers feel safe in their transactions with staff on the bus.**

The purpose of statement 17 is to further determine the security while customers dealt with staff on the bus.

**Table 2.17**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	26	25
Disagree	60	63
Undecided	138	154
Agree	61	60
Strongly Agree	215	198
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 18: Staff are always polite**

Table 2.18 reveals the expectations and perceptions of respondents in this project in terms of courtesy of staff in SRTUs.

**Table 2.18**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	20	27
Disagree	64	60
Undecided	110	113
Agree	51	60
Strongly Agree	255	240
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 19: Staff have in-depth occupational knowledge of their jobs.**

The data in Table 2.19 reveal the expectations and perceptions of respondents in this project in terms of occupational knowledge of staff.

**Table 2.19**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	23	27
Disagree	60	60
Undecided	110	118
Agree	77	60
Strongly Agree	230	235
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 20: The behaviour of staff instils confidence in the customers.**

The aim of statement 20 is estimate whether the behaviour of staff can be accepted.

**Table 2.20**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	23	27
Disagree	60	60
Undecided	127	113
Agree	60	51
Strongly Agree	230	250
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 21: Bus companies always look after the best interests of their customers.**

Statement 21 aims to determine whether SRTUs paid more attention to their customers.

**Table 2.21**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	23	29
Disagree	63	60
Undecided	100	131
Agree	104	75
Strongly Agree	210	205
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 22: Bus companies have operating hours convenient to all their customers**

In Table 2.22, the data reveal the expectations and perceptions of respondents in this project in terms of convenience of operation hours.

**Table 2.22**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	31	31
Disagree	60	60
Undecided	165	135
Agree	154	90
Strongly Agree	90	184
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 23: Getting information about the facilities and services of bus companies is easy**

The purpose of statement 23 is to assess whether customers can easily gain information while they choose from other means of transportation.

**Table 2.23**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	30	29
Disagree	72	60
Undecided	150	151
Agree	75	90
Strongly Agree	173	170
<b>Total</b>	<b>500</b>	<b>500</b>



**Statement 24: It is easy to find and access the bus stand.**

Statement 24 aims to determine whether the bus stand is accessible to their customers.

**Table 2.24**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	29	27
Disagree	75	60
Undecided	140	225
Agree	210	160
Strongly Agree	46	28
<b>Total</b>	<b>500</b>	<b>500</b>

**Statement 25: Staff can provide individualized attention to help customers.**

Statement 25 reveals that the expectations and perceptions of respondents in this project in terms of individualised attention of staff.

**Table 2.25**

<b>Score</b>	<b>Expectation Responses</b>	<b>Perception Responses</b>
Strongly Disagree	60	85
Disagree	68	70
Undecided	150	195
Agree	90	45
Strongly Agree	132	105
<b>Total</b>	<b>500</b>	<b>500</b>

### Gap Analysis

There are five dimensions in evaluating overall service quality. In this section, the data analyses focus on the mean gap scores on the expectations and perceptions scales for each of the modified 25 service quality attributes and the five related factors.

A negative gap indicates that customers perceived that service delivery did not meet their expectations; a positive gap indicates that customers perceived that service delivery exceeded their expectations.

### Factor - 1: Tangibles

The quality dimension is related to physical facilities, equipment, and appearance of personnel of the service delivery.

**Table 3.1 Gap Analysis of Factor-1 Tangibles**

<b>Statements</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>	<b>p Value</b>
Bus stand is attractive.	<b>3.142</b>	<b>3.168</b>	<b>0.026</b>	<b>0.9451</b>
Bus companies are equipped with modern technology.	<b>3.249</b>	<b>3.178</b>	<b>-0.071</b>	<b>0.6610</b>
Bus stand has adequate resource and capacity.	<b>3.524</b>	<b>3.504</b>	<b>-0.020</b>	<b>0.9853</b>
Bus companies have a professional appearance.	<b>3.734</b>	<b>3.686</b>	<b>-0.048</b>	<b>0.8603</b>
The dress of staff is neat and smart.	<b>3.704</b>	<b>3.714</b>	<b>0.010</b>	<b>0.9624</b>

## Factor - 2: Reliability

These statements were to assess the reliability of service quality of the SRTUs.

**Table 3.2 Gap Analysis of Factor-2 Reliability**

<b>Statements</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>	<b>p Value</b>
The bus always arrives at the destination on time.	<b>3.792</b>	<b>3.682</b>	<b>-0.110</b>	<b>0.7668</b>
The bus never breaks down on the road.	<b>3.828</b>	<b>3.758</b>	<b>-0.070</b>	<b>0.6512</b>
Customers can easily book a ticket for their journey.	<b>3.792</b>	<b>3.682</b>	<b>-0.110</b>	<b>0.6975</b>
Staff satisfy customers' requests right the first time.	<b>3.749</b>	<b>3.760</b>	<b>0.011</b>	<b>0.7374</b>
The timetable in the bus stand is error free.	<b>3.840</b>	<b>3.752</b>	<b>-0.088</b>	<b>0.8822</b>

### Factor - 3: Responsiveness

Statements in this factor primarily described the willingness of the SRTUs to help customers and provide prompt service, as well as the employees' skills and abilities to interact with people.

**Table 3.3 Gap Analysis of Factor-3 Responsiveness**

<b>Statements</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>	<b>p value</b>
Bus companies always inform people of change of timetable and prices in advance.	<b>3.786</b>	<b>3.804</b>	<b>0.018</b>	<b>0.6172</b>
Bus companies can provide timely and efficient service.	<b>3.792</b>	<b>3.813</b>	<b>0.021</b>	<b>0.8810</b>
Communication with customers is clear and helpful.	<b>3.708</b>	<b>3.790</b>	<b>0.082</b>	<b>0.7118</b>
Staff are always willing to help customers.	<b>3.816</b>	<b>3.780</b>	<b>-0.036</b>	<b>0.7948</b>
Staff can provide complete answers when they attend to customers' requests.	<b>3.860</b>	<b>3.894</b>	<b>0.034</b>	<b>0.9014</b>

**Factor - 4: Assurance**

These statements were related to assurance of service quality.

**Table 3.4 Gap Analysis of Factor-4 Assurance**

<b>Statements</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>	<b>p value</b>
Customers feel safe in their transactions with staff in the bus stand.	<b>3.752</b>	<b>3.718</b>	<b>-0.034</b>	<b>0.8999</b>
Customers feel safe in their transactions with staff on the bus.	<b>3.755</b>	<b>3.683</b>	<b>-0.072</b>	<b>0.7577</b>
Staff are always polite.	<b>3.914</b>	<b>3.854</b>	<b>-0.060</b>	<b>0.7638</b>
Staff have in-depth occupational knowledge of their jobs.	<b>3.865</b>	<b>3.834</b>	<b>-0.031</b>	<b>0.8682</b>
The behaviour of staff instils confidence in the customers.	<b>3.830</b>	<b>3.876</b>	<b>0.046</b>	<b>0.8668</b>

### Factor - 5: Empathy

These attributes in Table 3.5 are to evaluate the empathy dimension of service quality of the SRTUs.

**Table 3.5 Gap Analysis of Factor-5 Empathy**

<b>Statements</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>	<b>p value</b>
Bus companies always look after the best interests of their customers.	<b>3.831</b>	<b>3.736</b>	<b>-0.095</b>	<b>0.7917</b>
Bus companies have operating hours convenient to all their customers.	<b>3.421</b>	<b>3.672</b>	<b>0.251</b>	<b>0.8452</b>
Getting information about the facilities and services of bus companies is easy.	<b>3.581</b>	<b>3.626</b>	<b>0.045</b>	<b>0.7756</b>
It is easy to find and access the bus stand.	<b>3.342</b>	<b>3.200</b>	<b>-0.142</b>	<b>0.8599</b>
Staff can provide individualized attention to help customers.	<b>3.335</b>	<b>3.030</b>	<b>-0.305</b>	<b>0.6224</b>

### Comparison of quality dimensions

Table 4 aims to determine the means gap between expectation and perception with regard to five service dimensions.

**Table 4**

<b>Dimension</b>	<b>Expectations Mean</b>	<b>Perceptions Mean</b>	<b>Gap PM-EM</b>
Tangibles	<b>3.471</b>	<b>3.450</b>	<b>-0.021</b>
Reliability	<b>3.800</b>	<b>3.727</b>	<b>-0.073</b>
Responsiveness	<b>3.792</b>	<b>3.816</b>	<b>0.018</b>
Assurance	<b>3.823</b>	<b>3.793</b>	<b>-0.030</b>
Empathy	<b>3.502</b>	<b>3.453</b>	<b>-0.049</b>

As can be seen among the five dimensions, expectations for the SRTUs are highest for dimension “assurance” (M=3.823) – a dimension that covers the issues of competence, courtesy, credibility and security. Expectation for SRTUs is lowest for dimension “tangibles” (M=3.471). Perceptions for SRTUs is highest for dimension “responsiveness” (M=3.816). The lowest perception (M=3.453) is still for dimension "empathy".

## **T-Test**

The t-test is used to see if there are any significant differences in the means for two groups in the variable of interest. In this study, the paired t-test was carried out to test the significant difference between the two means of expectations and perceptions.

## **Hypothesis Testing and Results**

H1O: There is no significant difference in the gap between passengers' perceptions and expectations in service quality of SRTUs in Tamil Nadu.

H2O: There is significant difference in the gap between passengers' perceptions and expectations in service quality of SRTUs in Tamil Nadu.

## **Interpreting the p-value**

The p-value is a numerical estimate of the reliability of assumption that the difference in means on pre and post surveys is real and not due to chance.

A p-value of .10 or less is statistically significant, which means that we are 90% sure that the result we see (the difference in means for each question) is not due to chance.

A t-test for independent samples was conducted to examine hypothesis H2O.

This hypothesis was examined by t-test. There is no significant difference was found ( $p = .000$ , two-tailed). The results demonstrate that insignificant differences in passengers' perceived service quality of SRTUs are found.

In this study, the p-value of all the items is above .10. Therefore, t-test confirms that the change on all the items in SERVQUAL Questionnaire were "not significant at a  $p < .10$  level."

This result indicated that respondents found no gap between expectations and perceptions of service quality in SRTUs.



**Limitations**

As with all empirical studies, the present research had certain limitations.

- Firstly, the data were gathered in a specific geographic area of Madurai. As a result, the study may have contained some information and results that can be specific only for the city Madurai. Hence, the results of this study cannot be generalised.
- Secondly, the results of this study may not have been representative of the whole population, due to the fact that a convenience sampling method was used to collect the data.
- Thirdly, the demographic information of the respondents was not linked into the expectations and perceptions.

**Conclusion**

A comparison of passengers' perceptions of service quality with their expectations, using paired t-test, showed a statistically not significant difference on all of the 25 attributes examined in this study.

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