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THE PASSENGER SATISFACTION SURVEY IN THE REGIONAL INTEGRATED PUBLIC TRANSPORT SYSTEM

ABSTRACT

This article describes the Quality criteria Method of the Services in the Integrated Public Transport System in Slovak Republic. The proposed method is based on the detailed list of the Quality criteria of the Services in Public Transport from the view of passengers. The criteria are determined based on the Slovak Technical Norm STN EN 138 16 which is related to quality of transport. The method has been applied in Regional Integrated Public Transport System of Žilina (ŽRIDIS) in the form of Passenger Quality Satisfaction Survey.

KEY WORDS

quality criteria, matrix of SWOT analysis, survey, integrated public transport system, importance, satisfaction

1. INTRODUCTION

The Passenger Quality Satisfaction Survey in the Regional Integrated Public Transport System of Žilina (ŽRIDIS) has been based on the detailed list of the Quality criteria of the Services in Public Transport from the view of passenger that are stated in the Slovak Technical Norm STN EN 138 16. [2] The survey often represents the basic and useful approach in transport modelling or planning process and specially in public transport. [3,4]

Because the passengers often do not recognize the term "quality" in real life, only 23 quality criteria have been selected and focused on Public Transport Services. These Criteria of the Quality represent eight standards: Service, Accessibility, Information, Time, Care of Customer, Comfort, Safe and Environmental Impact. The Evaluation of the Quality criteria of the Services in the Integrated Public Transport System (IPTs) are presented in Table 2. The Quality criteria are in the left column of the table and they classify the three levels of the norm. The importance (I) and the

satisfaction (S) are weighted by scale from 1 to 10, where 1 means the lowest level of satisfaction and the lowest importance of the criterion and 10 means the highest level of satisfaction and the most important of the criterion.

2. EVALUATION OF QUALITY CRITERIA OF SERVICES IN IPTS

The analysis and evaluation process from survey has been calculated based on the statistical methods and formulas. The following statistical characteristics have been considered:

The arithmetic mean – is the most important medium value and it is very important in statistics. It is represented by a list of numbers or items and it is defined as the sum of all the numbers of a list divided by the number of items in the list.

The median – The median of a finite list of numbers can be found by arranging all the observations from the lowest value to the highest value and by picking the middle one. If there is an even number of observations, the median is not unique, so one often takes the mean of the two middle values.

The modus - is the middle value and it means the repeated value in the complex.

The variance - is one measure of statistical dispersion, averaging the squared distance of its possible values from the expected value (mean). Whereas the mean is a way to describe the location of a distribution, the variance is a way to capture its scale or degree of being spread out. The unit of variance is the square of the unit of the original variable. The positive square root of the variance, called the standard deviation, has the same units as the original variable and can be easier to interpret for this reason. The formula of variance is presented in eq. 1.

Table 1 - Evaluation of the Quality criteria of the Service in IPTS

Quality Criteria according to STN EN 13 816			Criteria used in the Survey		Ø I	Ø S
L1	L2	L3				
	Service		A	Service - Ø value		
1.2	networks		a	coverage of area by IPTS connections		
	1.3.1	time of operation	b	time of operation		
	1.3.2	frequency	c	number of connections		
	1.3.3	use of transports	d	number of seats in transport (capacity)		
1.4	suitability		e	the system for physically disabled and older people		
2.	Accessibility		B	Accessibility - Ø value		
	2.2	internal conversion	f	space of connections		
	2.3	availability of tickets	g	accessibility of buying tickets		
3.	Information		C	Information - Ø value		
	3.2.6	about the trip	h	availability of information		
	3.2.6	about the trip	i	clear information		
4.	Time		D	Time - Ø value		
	4.1	length of the travel time	j	time in transport		
	4.1.3	bus and train stops	k	time succession		
	4.2	observance of timetable	l	observance of timetable		
5.	Customer care		E	Customer care - Ø value		
	5.3	personnel	m	behaviour of haulier personnel (information, claim...)		
	5.5	tickets for sale	n	price of tickets		
	5.5	tickets for discount sale	o	ways of selling tickets		
	5.5.2	selling of discount tickets	p	selling of discount tickets		
6.	Comfort		F	Comfort - Ø value		
	6.3	comfort of travel	q	comfort of travel		
	6.4.3	cleanness	r	cleanness of bus and train stations		
	6.4.3	cleanness	s	cleanness of vehicles		
	6.5	level of equipment	t	level of equipment at bus and train stations (toilets, refreshment ...)		
7.	Safety		G	Safety - Ø value		
	7.1	safety after crime	u	safety of passengers after crime		
	7.2	safety after accident	v	safety of passengers after accident		
8.	Environmental pollution		H	Environmental pollution - Ø value		
	8.1	pollution	x	environmental pollution by public transport		

Source: authors' analysis

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1} \quad (1)$$

The selective standard deviation – is defined as the square root of the variance.

The coefficient of variation is a normalized measure of dispersion of a probability distribution. It is defined as the ratio of the standard deviation to the mean.

The survey results of the quality criteria of the IPTS services are suitable to be presented in the graphic of SWOT analysis (Figure 1). Axis “x” represents the importance of the quality criteria and axis “y” represents the satisfaction of criteria. The graph is divided into four parts according to criteria results. All eight categories are “within view” and it is easy to determine with which of the quality criteria the passengers are most satisfied and with which not.

satisfaction	high	commonplace "excellent level of services"	"Go away" Ø satisfaction of all criteria ↗
	low	tolerate imperfections "service acceptance"	"urgency immediate action or change" Ø importance of all criteria ↖
		low	high
		importance	

Figure 1 - SWOT analysis diagram of determination of quality criteria of the IPTS services

3. SURVEY RESULTS

The Passenger Quality Satisfaction Survey in ŽRIDS was realized in February 2006 during workdays in the mornings and afternoons.

The average number of daily passengers in ŽRIDS in 2006 was 600 passengers; therefore, the sample size of the survey was estimated at 100 respondents. [3] However, the survey included 125 "face-to-face" respondents at stations (station of Solinky, railway station of Zariečie, station of Rajecké Teplice and station of Rajec). The main advantage of using this method is the fact that the number of proposed respondents was realized for the sample size.

The survey questionnaire was divided into the following sections:

- place and time,
- instructions,
- table for satisfaction and importance of quality criteria (scale 1-10),
- total satisfaction with ŽRIDS services,
- particular transport data of respondents (transport-demographic data),
- data about respondents (place of home, sex, age, social status),
- other questions (a space was provided for the respondents to give their own opinions and comments).

The survey included 43% respondents aged 24, 51% respondents aged from 25-59 and 6% respondents above the age of 60.

Thirty-five percent (35%) of passengers were students, 55% were employers with worker pensioners and 10% were rest passengers (pensioners, mothers on maternal leave, unemployed).

The results regarding the question "how often the respondents travel with ŽRIDS", 45% of respondents answered that they often travel by ŽRIDS, 35% from time to time, 16% of respondents occasionally and 4% do not use it or do not know about it.

The quality criteria in ŽRIDS were evaluated by 95 respondents (the respondents, who travel with ŽRIDS often or from time to time). Based on the results, no criteria reached the average satisfaction of over 7.00. The average satisfaction was 5.45 and the average of importance of all criteria was 8.10.

The comparison of satisfaction and importance was made with the help of a *SWOT analysis Matrix of determining the quality criteria of ŽRIDS services*.

Section *commonplace* "too many services" contained criteria which have for passengers below-the-average importance and are with them better-than-average satisfied. The criteria include:

- serviced area of IPTS connections (a),
- time of operation (b),
- accessibility of information (h),
- simplicity of information (i),
- time in transport (j),
- behaviour of personnel (information, complaints...) (m),
- ways of tickets sales (o).

In the section "Go away" the passengers are satisfied better than the average with criteria and these criteria are for them better-than-average important. These criteria include:

- number of seats in vehicles (capacity) (d),
- accessibility of buying tickets (g),
- observance of timetable (l),
- price of tickets (n),
- sales of discount tickets (p),
- safety of passengers after accidents (v).

From criteria that belong to part "tolerate imperfections" "service acceptance" - that means that passengers are satisfied below-the-average and the criteria do not have for them better-than-average importance:

- cleanness of bus and train stations (r),
- cleanness of vehicles (s),
- system for physically disabled and older people (e),
- equipment of bus and train stations (toilets, refreshment...)(t),
- safety of passengers after crime (u) and
- environmental pollution caused by public transport (x).

The criteria that have for passengers better-than-average importance, but are below the average regarding their satisfaction with them, belong to part "urgency immediate action". This is very important. These include:

- number of connections (c),
- space of connections (f),
- time reliability (k) and
- comfort of travel (q).

For the question focused on the total satisfaction with ŽRIDS services, 81% of passengers are satisfied

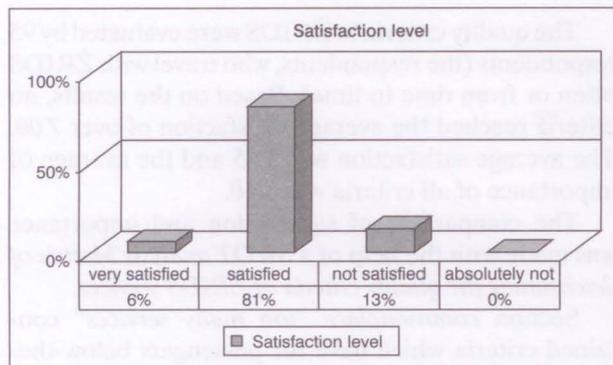


Figure 2 – Satisfaction with ŽRIDS services

with ŽRIDS services, 6% are very satisfied, and 13% are not satisfied (Figure 2).

4. CONCLUSION

The presented method of the Passenger Quality Satisfaction Survey in the Regional Integrated Public Transport System of Žilina can be used for all the existing and future Integrated Public Transport Systems in the Slovak Republic. Since many of the problems related to the Public Transport are solved only based on an economical point of view and the feedback from passengers is often ignored, this method uses the approach focused on the passengers' perception of the quality service. Therefore, it is important to realise the passenger quality surveys. The results of the survey can provide the information about the need for quality evaluation to the organizations or policy makers for further development of IPTS in Slovakia.

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ABSTRAKT

PRIESKUM SPOKOJNOSTI CESTUJÚCICH V INTEGROVANOM DOPRAVNOM SYSTÉME

Tento príspevok popisuje metódu hodnotia kritérií kvality služby v integrovanom dopravnom systéme v Slovenskej republike. Metóda je navrhnutá podľa detailného zoznamu kritérií kvality služby verejnej osobnej dopravy (VOD) z pohľadu zákazníka. Tento detailný zoznam je uvedený v slovenskej technickej norme STN EN 13816. Navrhnutá metóda merania spokojnosti cestujúcich bola aplikovaná na Žilinský regionálny integrovaný dopravný systém formou anketového prieskumu.

KLÚČOVÉ SLOVÁ

kritériá kvality, matica SWOT analýzy, prieskum, integrovaný dopravný systém, dôležitosť, spokojnosť

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