

Article

Concept for the Customer Perspective of the Balanced Scorecard (BSC) System in Bus Transport Companies in the Slovak Republic

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Abstract: Customer awareness and customer satisfaction are generally important attributes for the success and competitiveness of any business. In some sectors, they are studied very intensively; in others, they are neglected. In the field of transport services, it is important that the attitudes of customers are sufficiently monitored because public passenger transport has a lot of individual competition. Only satisfied customers can prefer public transportation over their own. In this context, this contribution analyses customer requirements and their satisfaction with bus public transport in the Slovak Republic. The opinions of customers are supplemented in this article with those of strategic managers. We ascertained customer requirements through questionnaire surveys. Using theoretical knowledge, we established hypotheses, which were subsequently verified using the selected statistical methods. Based on the findings, we proposed the concept of the target perspective of the BSC system for bus transport companies in the Slovak Republic in an effort to increase their competitiveness. Our procedure was also based on knowledge that is the output of various research studies in this area. Their results show that marketing strategies are considered the most important part of strategic management. Today, it is common in many industries that all business entities offer the same product at the same price under approximately the same technological conditions and with the assistance of equally well-equipped personnel. Therefore, a correctly set marketing strategy can also be the key to business success in transport services. The methods used in this paper were analysis, synthesis, questionnaire surveys, and the selected managerial and statistical methods. Our goal was to propose a concept of the customer perspective of the BSC system based on the analysis of customer requirements. We are convinced that the results of our survey can contribute to increasing the competitiveness of not only bus carriers in Slovakia, but also in other EU countries.

Keywords: bus transport; customer; customer requirements; BSC system; strategic management



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1. Introduction

Bus transport is an important sector in the Slovak Republic and is necessary to ensure the mobility of the population. Nowadays, public transportation is an integral part of our daily lives. Its constant development and growth are influenced by various factors, both positive or negative. In public transport, especially bus transport, the number of passengers has been decreasing in recent years. There are many reasons for this. According to some authors, one reason is the increased demand for individual car transport that is related to rising standards of living [1]. Another important reason is the COVID-19 pandemic which significantly affected the perception of public mass transport [2–5]. The use of public transport is influenced by the requirements for the quality of the transport service [6]. The quality of services in public bus transport is also an important determinant of demand and affects the competitiveness of these enterprises.

Based on the available statistical data, we present the Figure 1 of the development of passenger transport for millions of people over the last few years. These data show that the trend in the number of passengers is fluctuating.

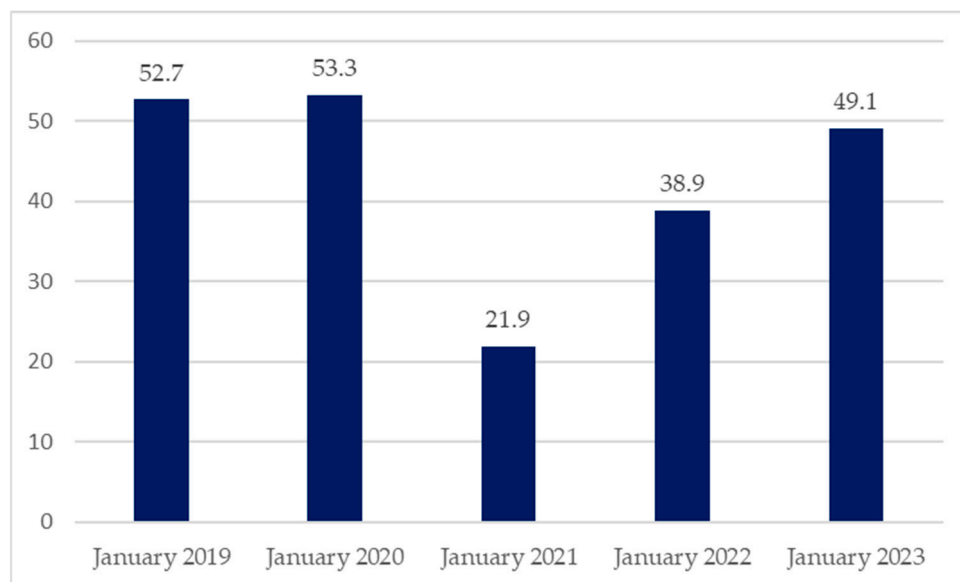


Figure 1. Number of transported persons in Slovakia. Source: own research.

A sufficient level of quality on the part of carriers to meet passenger expectations can be a means of increasing the demand or support for this form of transport. Household income, the price of travel, and the quality of the provided transport services are considered to be important determinants of the demand for public transport [7]. Service quality is related to people's habit of traveling by public transport because they feel that they lack adequate and reliable public transport [8,9].

Act 56/2012 Coll. [10] on road transport regulates access to the profession of a road transport operator, rules for doing business in road transport and in taxi services, ensuring regular transport services within a territory, the rights and obligations of carriers and passengers in bus transport and taxi services, conditions for the transport of dangerous goods, public administration in road transport, and dispatching. Bus transport is divided into city, intercity, long-distance, special transport, and trolleybuses. Urban transport, which is intended for operation with frequent stops in cities, also consists of suburban transport, which, unlike urban transport, has fewer parking spaces. Intercity transport is intended for passengers travelling with luggage between individual cities and their surroundings, and this type of transport is further divided into local and scheduled. In long-distance transport, which is divided into long-distance buses and long-distance tourist buses, standing passengers are excluded. Special bus transport is intended, e.g., for transporting invalids or prisoners [10].

Adequate transport services means the number of connections during the day and the accuracy and regularity of individual connections on individual bus lines satisfy public demand on individual days of the week, taking into account the possibility of simultaneous transport and transfers, the distance to stops, daily road capacity, traffic safety, equipment and vehicle capacity, and fares for specific passenger groups [11]. If the regular transport operated by a carrier on a commercial basis cannot sufficiently ensure the transport serviceability of the given territory, the customer has the right to order transport services in the public interest to the extent necessary to ensure the transport serviceability of the given territory [12]. The customer is the relevant self-governing region, the relevant city, or the Ministry of Transport and Construction of the Slovak Republic [11]. The advantage of bus transport lies in its flexibility; it can be used for short distances within the city, medium and long distances within the region, and international passenger transport. It serves small and

medium-sized cities or takes passengers for rail transport. In some countries, it is the main mode of transport; in others, it is a supplement to other modes of transport [13]. There are currently more than 50 public transport providers operating in Slovakia, including two tram systems and three trolleybus systems. The public transport operator can also provide suburban and long-distance transport [14].

Bus transport companies are not classic economic organizations that create an activity focused primarily on profit maximization. In this case, the attention of managers should be focused on increasing the profitability of the company through the development of services in the transport sector and minimizing operating costs. This fact contributes to strengthening competitiveness. However, cost minimization cannot be at the expense of the quality of the provided transport services. From the point of view of management, it is a relatively difficult situation. It is necessary to optimize costs and increase the quality of the services provided [15]. Therefore, from our point of view, the attitude of the customer is essential, which is transferred to the overall functioning of the company. The opinion of the authors of [16,17] also agrees with this opinion. The BSC concept connects the customer with the overall processes in the company, with experience in business management, and, last but not least, with the company's finances [18,19]. It promotes its individual character [20]. Linked to the BSC concept is the concept of the SERVQUAL model, which takes into account the customer's expectations of service and the perception of actual service quality in five service quality dimensions: (1) reliability, (2) assurance, (3) empathy, (4) tangibles, and (5) responsiveness. Each customer perceives the provided service differently, and the difference in expectation and perceived service is the difference that determines different levels of satisfaction [21]. During the development of the BSC model, it was pointed out that the transport company should focus primarily on the customer's needs and that the performance of the company's internal processes should be improved in order to be able to fulfil social goals. Financial goals should be achieved primarily by eliminating waste and using resources efficiently [22–24].

Businesses in bus transport lack specification in the form of measurable goals in individual areas of their strategy [25]. The BSC model can serve as a model that shows managers which areas require increased attention [26]. It is necessary to monitor these areas using appropriately selected indicators. The BSC system can be understood as a tool that focuses on business performance and strategic management [27,28]. It is perceived as a tool for increasing the company's competitiveness [29,30].

Based on the knowledge of the managers, it seems reasonable to link the implementation of the BSC with a special incentive program for the company's employees. The implementation of an incentive system based on the results of the BSC will make each employee aware of the personal benefits resulting from the employee's extraordinary efforts associated with the implementation of the corporate strategy [31]. This means that every employee in the company decides whether the strategy defined by the board of directors is implemented or not. The noticing of this fact by managers and taking it into account in the managed process requires a change in culture, but at the same time it contributes positively to the achievement of the goals set by the BSC [32].

2. Materials and Methods

The aim of this paper was to investigate customer requirements for bus transport and how managers of bus transport enterprises perceive customer requirements and transfer these requirements directly to the design of the BSC system concept for bus transport companies. For this analysis, we chose a quantitative research method in the form of a questionnaire. The respondents were divided into two groups. The first group of respondents consisted of customers who use bus transport. The second group was represented by companies operating in bus transport.

In order to fulfil the main goal of this contribution, it was necessary to fulfil sub-goals. Based on the analysis of theoretical knowledge, we found that people prefer a passenger car more often, mainly because of comfort, which was also contributed to by the COVID-19

pandemic. Based on this knowledge, we established hypothesis 1, and one of the sub-goals was to find out customer preferences for the use of a passenger car. We defined the first hypothesis as the assumption that respondents who own a car use public bus transport less than respondents who do not own a car. The element of ownership is also related to the use of a passenger car, which we followed up on in the second hypothesis. In this section, we dealt with the relationship between the ownership of a car and the use of public bus transport. At the time of the survey, the average salary in Slovakia was EUR 1418. We established the second hypothesis as the following: Respondents with an income of more than EUR 1300 per month use public bus transport less than respondents with an income of less than EUR 1300 per month. In the third hypothesis, we dealt with the relationship between the size of the company and whether companies carry out customer satisfaction surveys. We set the third hypothesis as an assumption: medium-sized enterprises providing public bus transport carry out satisfaction surveys to a greater extent than small enterprises providing public bus transport. In the fourth hypothesis, we based on theoretical knowledge. We tried to find out the connection between ecology and the use of public transport, which is considered an ecological transport option. Within this aspect, we defined the following hypothesis: We assume that small businesses perceive the importance of ecology in the framework of marketing when communicating with customers more than medium-sized businesses.

We conducted the survey using two questionnaires, one of which was intended for respondents using public mass transport, and the second was intended for the management of bus transport companies. The first questionnaire focused on the use and reasons for traveling by public mass transport, finding problems in the area of their satisfaction, analyzing requirements, and then proposing a solution that should increase satisfaction with the transport used. The second questionnaire was focused on and intended to survey the perception of customer requirements by public mass transport companies. It contained questions regarding the companies themselves in order to obtain basic information about them, followed by questions directed at the perception of customers and their satisfaction or requirements in public mass transport, and other questions focused on how the company sees itself in the competitive environment.

Different types of questions were used in the questionnaires, such as dichotomous (yes or no), simple choice (choice of only one of the options), multiple choice (choice from several offered options), and matrix questions. The first survey was conducted through an anonymous questionnaire that was accessible to the general public on Google Forms. The questionnaire was publicly available for 4 months (10 November 2022–15 February 2023) and was aimed at respondents who use public transport either regularly, irregularly, or have used it at least once. Based on the calculation performed using the sample size calculator, we found out how many respondents, or survey responses, we need to achieve the required level of accuracy in the results. In the calculation, we entered the size of the population of Slovakia, which was our target group for the research, as well as the error rate, which we set at 5%. Finally, we entered a sampling confidence level of 95%. Based on the values and conditions determined in this way, the recommended sample size was 385. This group of respondents was approached using the method of questioning in the form of a questionnaire. A total of 416 respondents filled out the questionnaire. In terms of the requirement of a minimum number of respondents, we can state that the number of answers was sufficient for the needs of the research.

Subsequently, we used the same procedure to calculate a suitable sample size for the second survey, which was intended for companies providing public mass transport. The total number of companies based on data obtained as of 8 November 2022, was 244, which we entered into the sample size calculator as the initial data with a 5% error rate and a 95% confidence level. The resulting value of the recommended sample size was 150 enterprises. The survey was conducted over a period of six months, and we sent the questionnaire electronically and then contacted the companies by phone. Since we did not manage to fulfill the return even after sending the questionnaire for the third time, we decided to

conduct the questionnaire through a telephone interview. In the end, we managed to obtain 151 responses, which is a 62% return rate. The collected data from both surveys were subjected to evaluation.

In the paper, we established four hypotheses that resulted from the analysis of theoretical knowledge.

2.1. The First Hypothesis

The first hypothesis is the result of the assumption that people prefer a passenger car more often, mainly due to comfort, convenience, and the effects of the COVID-19 pandemic. We assumed that respondents who own a car use public bus transportation less than respondents who do not own a car.

H0 (null). *We assume that there is no statistically significant difference in the use of public bus transport between car owners and those who do not own a car.*

H1 (alternative). *We assume that there is a statistically significant difference in the use of public bus transport between car owners and those who do not own a car.*

2.2. The Second Hypothesis

The second hypothesis was devoted to the relationship between the ownership of a passenger car and the use of public bus transport. The average monthly salary of an employee in Slovakia during the survey period, i.e., in the range of dates from 10 November 2022 to 15 February 2023, was at the level of EUR 1418, according to the data found on the website of the Statistical Office of the Slovak Republic. In this hypothesis, we assumed that respondents with an income of more than EUR 1300 per month use public bus transport less than respondents with an income of less than EUR 1300 per month.

H0 (null). *We assume that there is no statistically significant relationship between the amount of income and the use of public bus transport.*

H1 (alternative). *We assume that there is a statistically significant relationship between the amount of income and the use of public bus transport.*

2.3. The Third Hypothesis

Due to the return of the questionnaire for enterprises, where the feedback from large enterprises was in the range of 7, which would not give relevant results, we established hypotheses for medium and small enterprises. Medium-sized public bus transport companies carry out satisfaction surveys to a greater extent than small public bus transport companies.

H0 (null). *We assume that there is no statistically significant relationship between conducting satisfaction surveys and company size.*

H1 (alternative). *We hypothesize that there is a statistically significant relationship between conducting satisfaction surveys and company size.*

2.4. The Fourth Hypothesis

We focused on the connection between ecology and the use of public transport, which is considered an ecological transport option, and we defined the following hypothesis: We assume that small businesses perceive the importance of ecology in the framework of marketing when communicating with the customer more than medium-sized businesses.

H0 (null). We assume that there is no statistically significant difference in the perception of the importance of ecology in marketing and communication with the customer between small and medium-sized enterprises.

H1 (alternative). We hypothesize that there is a statistically significant difference in the perception of the importance of ecology in marketing and customer communication between small and medium-sized enterprises.

The statistical evaluation of the established hypotheses was carried out in the Microsoft Excel® program (Microsoft Office, <https://www.microsoft.com/en-us/microsoft-365/excel>, accessed on 7 November 2023) with the additional help of Real Statistics software (<https://real-statistics.com/>). We verified the statistical significance in all tests at the $\alpha = 0.05$ level. At the beginning, we set research null and corresponding alternative hypotheses, which we subsequently tested. Due to the ordinal nature of the monitored data (data recoded on a gradual scale), the prerequisites for the use of parametric statistical methods were not met.

The first statistical method used was the Mann–Whitney test (two-sample Wilcoxon test) used to compare 2 independent samples of ordinal variables (it was used in the evaluation of hypotheses no. 1 to 4). The test consists of two steps. The first step is to calculate the U value:

$$U = S - \frac{n(n+1)}{2} \quad (1)$$

where:

S—the sum of the order of the values of one examined file,

n—extent of the examined file.

The second step is to calculate the Z statistic.

$$Z = \frac{U - \frac{nm}{2}}{\sqrt{\frac{nm(n+m+1)}{12}}} \sim N(0, 1), \quad (2)$$

where:

n—extent of the first file,

m—the extent of the second file.

We then compare the test characteristic with the table value Z, which has a normal distribution.

The second statistical method was Pearson's test of independence of qualitative data (chi square test of independence). It is used to verify the independence between two qualitative features (it was used in testing Hypothesis 3). In the first step, the results of the data collection are sorted in a contingency table of frequency of type $r \times s$ with individual observations for the given category. The test criterion is Pearson's 2 coefficient, which is defined by the relation:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^s \frac{(n_{ij} - e_{ij})^2}{e_{ij}} \quad (3)$$

where:

$$e_{ij} = \frac{n_{j.} \cdot n_{.i}}{n} \quad (i = 1, 2, \dots, r; j = 1, 2, \dots, s), n = \sum_{i=1}^r \sum_{j=1}^s n_{ij} \cdot e_{ij} \quad (4)$$

e_{ij} are the expected frequencies under the validity of the null hypothesis (observed characters are independent of each other). We measure the effect size for the chi-square test of independence using Cramer's V coefficient, which measures how strongly the categorical fields are connected. The resulting values of the coefficient range from 0 to 1, while a value in the range of 0 to 0.2 indicates a weak dependence, 0.2–0.6 a medium dependence, and values ≥ 0.6 a strong degree of dependence.

The last statistical method was Spearman's correlation coefficient used to express the strength of dependence between two ordinal variables or in cases of the violation of the assumptions for the use of the parametric Pearson correlation coefficient (the test was used in the evaluation of hypothesis No. 2). Thus, it expresses the difference between the probability that the values of two variables have the same order and the probability that these values do not have the same order. Spearman's correlation coefficient is determined by the relation:

$$r_s = 1 - \frac{6}{n(n^2 - 1)} \sum_{i=1}^n (R_i - Q_i)^2 \quad (5)$$

where:

n —total file extent,

R_i —order of the i -th value of variable X ,

Q_i —order of the i -th value of variable Y .

The resulting value of the coefficient takes on values from the interval $(-1, 1)$, where a value of 1 expresses the maximum positive correlation (both values increase directly proportionally), a value of -1 , on the contrary, is a negative correlation (the value of one variable decreases proportionally to the increasing value of the other variable), and a value of 0 symbolizes zero correlation (no relationship between variables). We verified statistical significance by comparing the test characteristic with the tabular value of Student's t -distribution for the given significance level (0.05) with $n-2$ degrees of freedom.

When creating the customer perspective of the BSC system, we used Saaty's matrix. It is a quantitative pairwise comparison method that serves to evaluate individual criteria using weights. The method not only determines the direction of preferences but also serves to determine the size of preferences for pairs of criteria by determining the number of points on a point scale. Nine points are used in the scale, and odd values are mainly used in the evaluation of pairwise comparisons of criteria. This method is used for assessment by a single expert. Even values are used to express more sensitive preferences. Saaty's method is a square matrix, of order $n \times n$ or reciprocal, where $S_{ij} = 1/S_{ji}$. The elements of the matrix represent estimates of the weight shares of the i -th and j -th criteria. The diagonal of Saaty's matrix always has the value of 1, which means that the criteria are equivalent to each other [33]. Scale of Saaty's method:

1—the criteria are equally important,

3—the first criterion is slightly more significant than the second,

5—the first criterion is much more important than the second,

7—the first criterion is very strongly more significant than the second,

9—the first criterion is absolutely more significant than the second [33].

We assign individual values according to the significance of the criterion; the higher the significance of the given criterion, the higher the weight assigned to it. In order to calculate the weights, we first need to calculate the geometric mean of the rows of Saaty's matrix. The geometric mean is calculated as follows:

$$g = \sqrt[n]{\prod_{j=1}^n (s_{ij})} \quad (6)$$

where:

g —geometric diameter,

S_{ij} —shares of criteria weights,

n —total number of elements.

We obtain the standardized weight of a criterion by dividing its unstandardized weight by the sum of the unstandardized weights of all criteria; in mathematical expression, it is as follows:

$$v_i = \frac{b_i}{\sum_{i=1}^k b_i} \quad (7)$$

where:

v_i —standardized weight of the criterion,

b_i —unstandardized weight of the criterion,

k —number of criteria.

3. Results and Discussion

Traffic management has undergone constant development in recent decades [34]. This process is essential for improving management efficiency and increasing the competitiveness of transport companies. It is also a reflection of the fact described by [35,36] as an opportunity for contemporary transport planners to use advances in information technology and optimization methods to design modern services that integrate and coordinate different modes of transport.

From the point of view of internal management, quality improvement can be manifested by the use of various support tools for tracking customer preferences [37]. They also include the use of the BSC system, which, as [38] explain, consists of a set of measures. The measures relate to four main management perspectives and aim to provide senior managers with a comprehensive view of their business. The four perspectives of the BSC are financial, customer, internal processes, and learning and growth [39]. The BSC combines financial and operational measures and focuses on the organization's short- and long-term strategic goals. The authors in [40] argue that the BSC architecture starts with a transparent definition of the mission, vision, and strategy of the institution. Management thus assumes the importance of setting these parameters, which include the universality of the most important stakeholders. The statement is supplemented by the knowledge of authors in [41], who know that the BSC uses the vision and strategy from the declared mission of the organization to develop a comprehensive measurement of its performance. The BSC involves combining past performance measures with the measures of the drivers of future performance [42]. The authors in [4] add that the BSC can help these organizations focus on outcomes that are important to the community that they serve. With reference to the mentioned context, in the article we drew attention to the design of the concept of the customer perspective of the BSC system in order to increase the competitiveness of bus transport companies in Slovakia.

Based on the analysis of the available literature in the fields of public bus transport and the BSC system, we created the following bibliometric map, which tells whether these two terms are connected.

The bibliographic map is a visualization of keywords for the BSC system and public bus transport based on 180 articles from Web of Science data, visualized using the VOS Viewer. Each cluster in the map represents a keyword, and the larger the cluster, the greater the number of published papers. We have included relevant keywords: bus transport, public transport, accessibility, optimization, and service. The results are shown in the Figure 2.

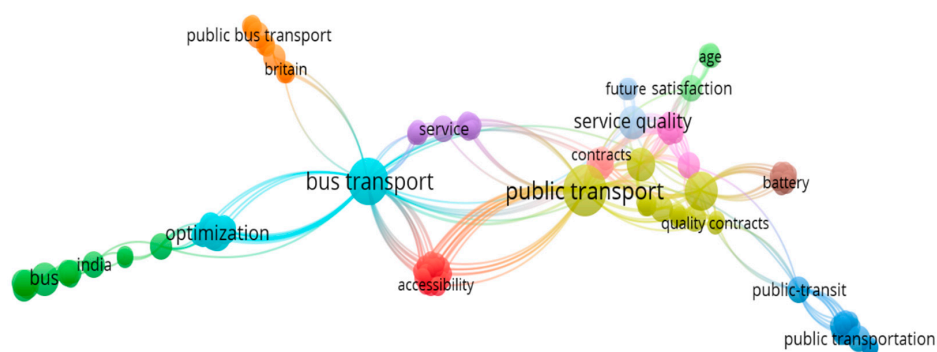


Figure 2. Visualization of keywords such as strategic management and public transport. Source: own research.

In this representation, the thinner the link between clusters, the smaller the number of co-occurrences between keywords, and vice versa. The map shows that the most common is cooperation between bus transport, public transport, services, and accessibility. The largest clusters are colored red for the largest (cluster 1), green for the second largest (cluster 2), dark blue for the third largest (cluster 3), and yellow for the fourth largest cluster (cluster 4).

Bus traffic, which looks like a big cluster, is just a single faint blue ball that connects to another faint blue ball, but there is already a cluster of smaller balls (cluster 6). The biggest node in the red cluster is competence. The size of the nodes in the green cluster is relatively uniform. The green clustering is largely focused on busses, the dark blue cluster is focused mainly on public transport regarding vehicles, and the yellow cluster also contains the public transport node, which dominates there alongside the policy and performance nodes.

We can only see keywords related to public transportation on the map. However, we were looking for a connection between the key words BSC system and bus transport. The map confirmed the assumption that this connection does not exist and is not even discussed because the BSC system did not appear on the map at all.

Considering the aim of this contribution, we summarized the results into a part dedicated to the results of the questionnaire for customers and a part dedicated to the results of the questionnaire survey of bus transport companies. Based on these results, we created a BSC system concept for bus transport companies using Saaty's matrix. It is important for the strategic management of bus transport companies and has an impact on their competitiveness. Based on the defined term customer perspective, we can conclude that in today's competitive era, the basis of every business is defining the customers for whom products and services will be produced and determining ways to achieve this goal. The conditional success of the company is mainly customer satisfaction, because the more satisfied the customer is, the better preferences can be expected from the customer, and at the same time, the company's competitive advantage and position in the given market segment also grow. A satisfied customer makes repeated purchases of goods or services and creates a positive awareness of the company in the customer's surroundings. What matters to businesses is what customers actually perceive as value, but that cannot be ascertained without closer contact with them, feedback, or regular communication. As part of the analysis of passenger requirements for public bus transport, it is necessary to introduce measures that would help make this type of transport more attractive, thereby increasing the number of passengers. On the contrary, it would help to reduce the use of individual transport and, consequently, the delay of public transport links in the main peaks, thanks to the reduction of the amount of congestion on the roads as part of the elimination of individual transport. We will deal with the statistical evaluation of the relationships among the investigated elements in more detail in Section 3.3 of this contribution.

3.1. Summary of the Customer Questionnaire

From the evaluation of the questionnaire survey for customers, we can conclude that more than half of the respondents regularly use public transport, either on a daily basis or several times a week. The most commonly used types of transport are urban public transport and suburban transport, which are mainly used for the purpose of going to school or work. Also, more than half of the respondents perceive this option of transport as ecological, which also results in their willingness and conviction to use it more often. Many respondents are satisfied with the public means of transport that are used in terms of age, appearance, and quality, but only a small number would accept the renovation of the vehicle fleet. A similar question regarding satisfaction with public transport means, but with its equipment, had results very similar to the previous question. In other words, satisfaction from this side is also very high. However, despite their great satisfaction with the public means of transport that are used, the respondents would accept additional services, namely an internet connection, online ticket purchasing, and the possibility of contactless payment. Accepting new services is one thing, but at the same time, it is necessary to maintain already established services at a certain level or even increase that level. The most important option for customers is the price, but it is not easily influenced since it is affected by many factors, and transport companies have to adapt to them with the price. The cleanliness of the means of transport is also very important from the customer's point of view, which improved after the onset of the COVID-19 pandemic and more emphasis was placed on it. It was found from the survey that the observance of the timetable is also perceived by customers

as a very important factor. Stops and shelters are important for customers and should meet criteria such as safety or shelter from the weather.

3.2. Summary of the Questionnaire for Businesses

The following are the basic findings from the evaluation of the questionnaire for bus transport companies. The most commonly used elements of strategic management are mission and strategy. Fewer companies have a defined vision and goals, and only nine companies do not have any of these options defined, which we consider acceptable from the total number of respondents. Elements of strategic management such as vision, mission, and goals can help define the BSC system. Businesses also use different methods in business management, most specifically strategic planning. Not a single bus transport company in Slovakia uses the BSC system because the introduction of this system is financially demanding. Another important finding for us is that more than half of the surveyed companies conduct customer satisfaction surveys, most of them on an annual basis. The most important thing for the company to communicate with the customer about is their satisfaction, and the least important is the loyalty program. Customer satisfaction also came up in the priorities of the company's management for the next period.

3.3. Evaluation of Established Hypotheses

In this chapter, we will verify and evaluate the hypotheses that we established above. The given hypotheses were established on the basis of theoretical knowledge.

3.3.1. The First Hypothesis

The hypothesis was tested using the Mann–Whitney test for two independent samples based on car ownership (car owners vs. non-car owners). The test result confirmed a statistically significant difference between the compared selections when the test characteristic reached a higher value (7.52) than the table test criterion (1.96). A statistically significant difference was also confirmed by the resulting p -value ($p < 0.001$), which is lower than the tested level of significance, i.e., 0.05. Based on this result, we reject the established null hypothesis and accept the alternative hypothesis. Therefore, we conclude that there is a statistically significant difference in the use of public transport between car owners and those who do not own a car. The resulting characteristics of the Mann–Whitney test are shown in Table 1.

Table 1. Testing the first hypothesis using the Mann–Whitney test. Source: own research.

Name of the Test Criterion	The Value of the Test Criterion
Test characteristic (z)	7.52
Table value	1.96
U value	11,278.5
p -value	<0.001

The graphic processing of the comparison of the values of the monitored selections is provided by the following Figure 3.

3.3.2. The Second Hypothesis

The hypothesis was tested using Spearman's correlation coefficient. The resulting value of this coefficient reached the level of $R = -0.40$ (Table 2), which expresses a moderately strong negative degree of correlation between the monitored variables. We can therefore conclude that a lower rate of use of public bus transport is correlated with a higher income. At the same time, the correlation was evaluated as statistically highly evident ($p < 0.001$). Based on this result, we reject the established null hypothesis and accept the alternative one. We can therefore conclude that there is a statistically significant negative relationship between the amount of income and the use of public bus transport.

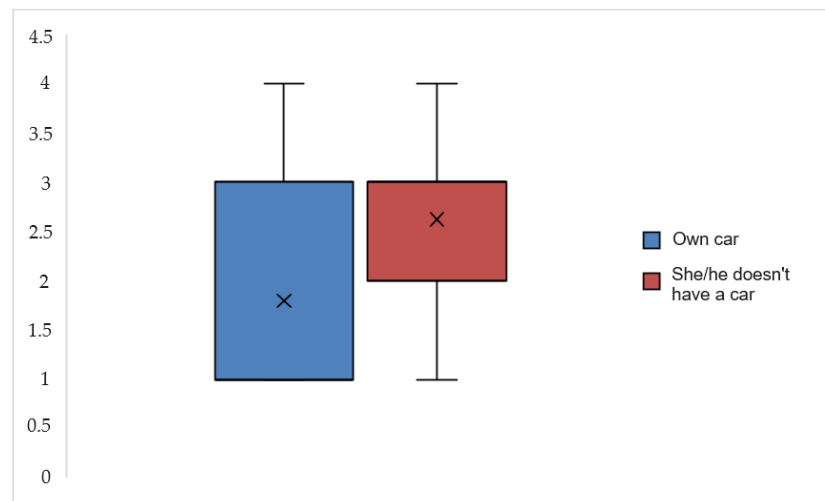


Figure 3. Findings regarding car ownership. Source: own research.

Table 2. Testing the second hypothesis using Spearman's correlation coefficient. Source: own research.

Name of the Test Criterion	The Value of the Test Criterion
Test characteristic (z)	8.78
Table value	1.65
<i>p</i> -value	<0.001
Spearman's coefficient	−0.401

The graphic processing of the observed relationship is shown in the following Figure 4. The negative correlation coefficient (−0.401) means that the higher the income, the lower the frequency of using public transport. So, it is an indirect relationship. This expresses the negative sign of the correlation coefficient. The strength of dependence means how strong the influence of one variable is on another; specifically, it could be said that the variability of the use of public transport can be explained by the level of income. This influence is moderately strong, which means that the frequency of using public transport is, of course, influenced by other factors besides the one under investigation (level of income).

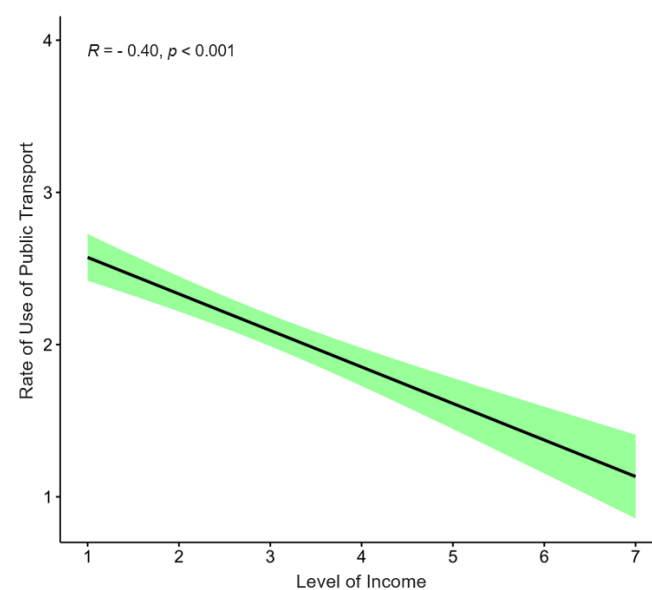


Figure 4. The relationship between the level of income and the rate of use of public transport. Source: own research.

3.3.3. The Third Hypothesis

In the case of the third research hypothesis, we verified the dependence of qualitative (nominal) variables. For this reason, Pearson's chi-square (χ^2) test of independence was used for testing. For the purpose of evaluation, in the first step, we created a contingency table of empirical frequencies, which we then tested. The detected frequencies are shown in the Table 3.

Table 3. Contingency table of analyzed data. Source: own research.

	They Conduct Surveys	They Do Not Conduct Surveys	Total
Small business (up to 49 employees)	63	38	101
Medium enterprise (from 50–249 employees)	27	16	43
Total	90	54	144

The test result ($\chi^2 = 0.002$; $df = 1$; $p = 0.96$) did not confirm a statistically significant (significant) relationship between the observed variables when the value of the test characteristic (0.002) did not exceed the value of the table test criterion (3.84). Likewise, the p -value (0.96), which is higher than the established level of significance (0.05), also confirms the statistically inconclusive result. The value of Cramer's contingency coefficient (Cramer's V) confirmed an almost zero (negligible) relationship (0.003) between the variables. Based on this result, we cannot reject the established null hypothesis, and on the contrary, we reject the alternative one. Therefore, we conclude that there is no statistically significant relationship between the implementation of satisfaction surveys and the size of the company. The customer satisfaction survey response is shown in the Figure 5.

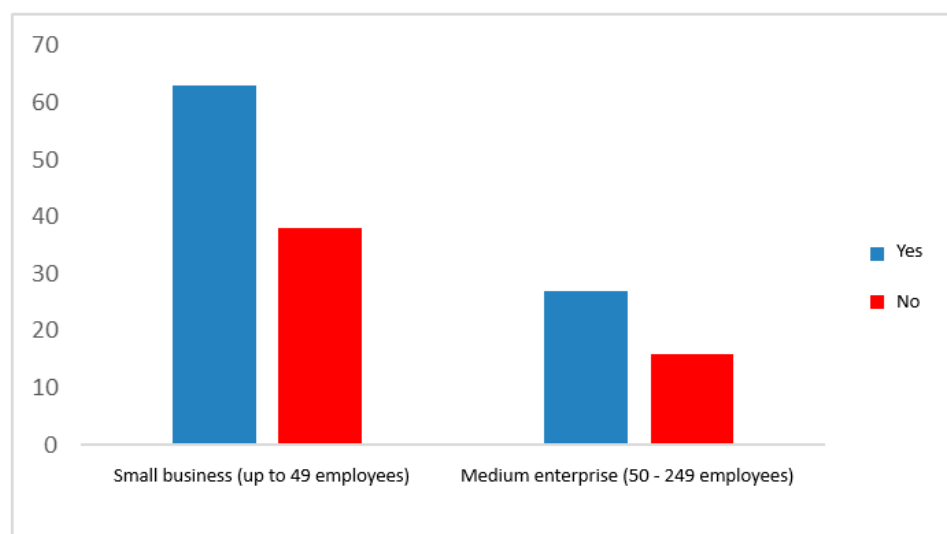


Figure 5. A proportional representation of the number of responses in the framework of customer satisfaction surveys in terms of company size in the form of a contingency graph. Source: own research.

The results clearly show that there is no connection between the size of the company and the frequency of surveys. In other words, there is no significant difference between small and medium-sized enterprises between companies that conduct surveys and those that do not. It cannot be said that if the company conducts a survey, it will be, for example, a medium-sized enterprise, and if it does not, it is more likely to be a small enterprise. No such relationship could be detected.

3.3.4. The Fourth Hypothesis

We tested the hypothesis using the Mann–Whitney test for two independent samples based on company size (small vs. medium). The test result in this case did not confirm a statistically significant difference between the compared selections when the test characteristic reached a lower value (0.10) than the table test criterion (1.96). The statistically insignificant result was also confirmed by the resulting p -value ($p = 0.92$), which is higher than the tested level of significance, i.e., 0.05. We cannot reject the established null hypothesis based on this result and reject the alternative hypothesis. Therefore, we conclude that there is no statistically significant difference in the perception of the importance of ecology in marketing and communication with the customer between small and medium-sized enterprises. The resulting characteristics of the Mann–Whitney test are presented in Table 4.

Table 4. Testing the fourth hypothesis using the Mann–Whitney test. Source: own research.

Name of the Test Criterion	The Value of the Test Criterion
Test characteristic (z)	0.10
Table value	1.96
U value	2148.5
p -value	<0.92

The graphic processing of the comparison of the values of the monitored selections is provided by the Figure 6.

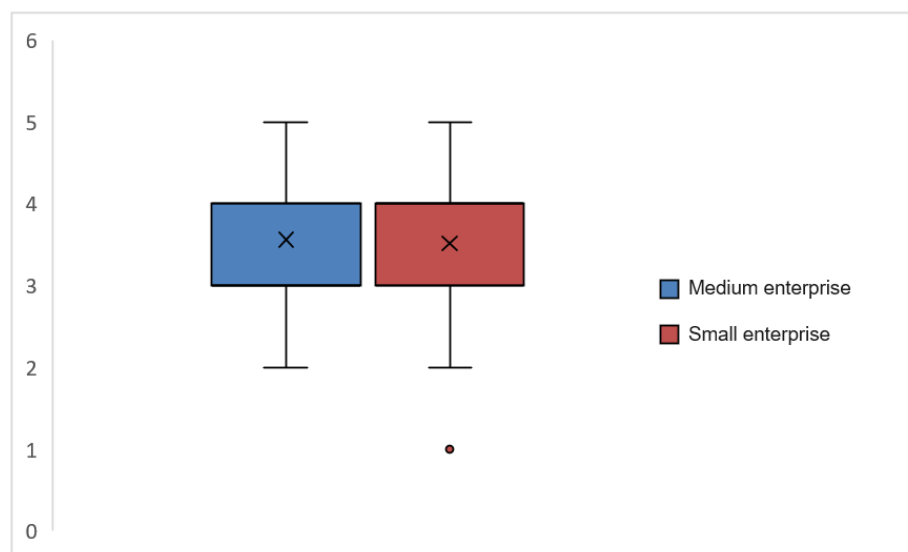


Figure 6. The difference in the perception of the importance of ecology in the marketing of communication with the customer in terms of the size of the company. Source: own research.

In this paper, we paid attention to four selected hypotheses that we established before conducting a questionnaire survey, which was aimed at customers as well as the management of bus transport companies. We are aware that in this area it would be possible to carry out various surveys and analyze various statistical indicators, as well as evaluate various statistical methods. We established hypotheses based on existing research, excluding potential limitations and biases.

3.4. Draft Concept of the BSC System for Bus Transport Companies in Slovakia

In our work, we do not want to propose the entire concept of the BSC system, but only want to point out the importance of the customer perspective, which is important for strategic management. First, we introduce the term customer perspective, which is one of the four perspectives of the BSC method. Based on the defined customer perspective,

we can conclude that in today's competitive era, the basis of every business is defining the customers for whom products and services will be produced and determining ways to achieve this goal. The conditional success of the company is mainly customer satisfaction, because the more satisfied the customer is, the better preferences can be expected from the customer, and at the same time, the company's competitive advantage and position in the given market segment also grow. A satisfied customer makes repeated purchases of goods or services and creates a positive awareness of the company in the customer's surroundings. It is important for businesses to know what customers actually perceive as value, but it is impossible to find out without closer contact with them, feedback, or regular communication. As part of the analysis of passenger requirements for public bus transport, it is necessary to introduce measures that would help make this type of transport more attractive, thereby increasing the number of passengers. On the contrary, it would help to reduce the use of individual transport and, consequently, to reduce the delay of public transport connections in the main peaks, thanks to the reduction of the amount of congestion on the roads as part of the elimination of individual transport.

3.4.1. Summary of the Customer Questionnaire

From the evaluation of the questionnaire survey for customers, we can conclude that more than half of the respondents regularly use public transport, either on a daily basis or several times a week. The most used types of transport are urban public transport and suburban transport, which are mainly used for the purpose of going to school or to work. Also, more than half of the respondents perceive this option of transport as ecological, which also results in their willingness and conviction to use it more often. A large number of respondents are satisfied with the use of public means of transport in terms of age, appearance, and quality, but only a small number would accept the renovation of the vehicle fleet. A similar question regarding satisfaction with public transport means, but within its equipment, had results very similar to the previous question. In other words, satisfaction from this side is also very high. Despite the expressed great satisfaction with the public means of transport used, the respondents would accept additional services, namely internet connections, online ticket purchasing, and the possibility of contactless payment. Accepting new services is one thing, but at the same time, it is necessary to maintain already established services at a certain level or even increase that level. The most important among the options for customers is the price, but it is not easily influenced since it is affected by many factors and transport companies have to adapt to them with the price. The cleanliness of the means of transport is also very important from the customer's point of view, which improved after the onset of the COVID-19 pandemic and more emphasis was placed on it. From the conducted survey, it was found that compliance with the travel schedule is also perceived by customers as a very important factor. Stops and shelters are important for customers and should meet criteria such as safety or shelter from the weather.

3.4.2. Summary of the Questionnaire for Businesses

The following are the basic findings from the evaluation of the questionnaire for bus transport companies. The most commonly used elements of strategic management are mission and strategy. Fewer companies have a defined vision and goals, and only nine companies do not have any of these options defined, which we consider acceptable based on the total number of respondents. Elements of strategic management, such as vision, mission, and goals, can help define the BSC system. Businesses also use different methods in business management and, most specifically, strategic planning. Not a single bus transport company in Slovakia uses the BSC system because the introduction of this system is financially demanding. Another important finding for us is that more than half of the surveyed companies conduct customer satisfaction surveys, and most of them on an annual basis. The most important thing for the company to communicate with the customer is their satisfaction, and the least important thing is the loyalty program.

Customer satisfaction also came up as one of the priorities of the company's management for the next period.

The decision to introduce the BSC system into a company is made by the top management. The development of the system is furthered by the competence of mixed teams of internal workers and external consultants. If the company decides to develop the BSC system only with the help of internal employees, these employees must be highly qualified and informed, both theoretically and practically, when implementing the BSC. Business areas integrated in the BSC system must be departments and teams from the financial area, business processes, branches and plants, and business units that are also at the corporate level or only at the corporate level. The duration of the implementation of the BSC system ranges from 6 to 10 months, and a team of at least 10 employees is required for this. Implementation costs also depend on the size of the company, but mainly on the structure of the company and the methods used, such as controlling, strategic management, etc. External costs related to IT solutions, external consultants, seminars, etc. are also taken into account. If the company decides to use an internal employee to implement the BSC system, it must take into account the costs of high-quality retraining. The price of the course, which is intended primarily for the top managers of the company, owners, middle management, economists, financiers, or other workers involved in the management of the company, is around EUR 276 for one day. The aim of this course is to clarify the process of strategic management and the evaluation of the company's performance and to expand knowledge in the area of KPI (Key Performance Indicator) use and their effective use, focusing on different types of organizations. The organizer of this course is FBE, LLC. They should also participate in a course called "Methodology for Creating and Using the Balance Scorecard." Its price is EUR 240 for one day, and this course is conducted by MENTIS, LLC. The need to attend individual courses is recommended for 5 days. Most courses, if they are not online, are conducted in Bratislava. Subsequently, the trained employee would gradually train all the workers involved. The estimated cost of introducing the BSC system in the Slovak Republic is EUR 20,000. The budget includes all costs, which include the services of an external consultant, labor costs, and the necessary IT system. The introduction of the BSC system in the company has many advantages that exceed the total cost of introducing this system in the company [42,43]. Our evaluation of the BSC system, which we recommend to bus companies, would cost EUR 20,000 plus the partial costs of the courses. From our point of view, however, it is possible to use only the concept of the BSC system itself. So even companies that cannot afford the expensive implementation of a BSC system can use the concept of this system to increase their own competitiveness. The principles of the BSC concept can be used free of charge [44,45]. In this post, we focused on the customer perspective as a tool to improve the customer experience, increase the number of customers, and increase customer satisfaction. In one of the questions from the questionnaire for customers, we investigated the views of customers on the importance of improving individual options (listed in Figure 7). With the help of multi-criteria decision-making through Saaty's matrix, we confronted this view of customers with the view of the management of bus transport companies. The table shows that the managers of bus transport enterprises give the greatest weight to the price, the cleanliness of the means of transport, and the ecology of travel. They set lower weights for stops and shelters, driver behavior, and the loyalty program. Based on the results, we can conclude that price is also the most important factor for customers. According to them, the cleanliness of the means of transport is also important. However, they perceive the ecology of travel and compliance with the travel schedule differently. The fourth most important point for customers is stops and shelters, followed by driver behavior and travel ecology.

After developing Saaty's matrix, we based it on the results of the questionnaire surveys while additionally consulting the scales with the top management of the selected companies. According to the top management, the highest weight is assigned to the price, the cleanliness of the means of transport, and the ecology of travel. Weaker weights came out for stops and shelters, driver behavior, and the loyalty program. We compared the

assigned weights with the opinions of the contractors. In a questionnaire survey, we found out which areas customers consider important. In a separate question, we focused on the improvement of bus services from their point of view.

Saaty matrix		Joint thickening	Adherence to the travel schedule	Driver behavior	Recharging chip cards	Possibilit y of payment by mobile phone	Stops and shelters	Online ticket purchase	The ecology of travel	Cleanliness in the means of transport	Loyalty program	The price		
		X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	Geometric average	Criteria weights
Joint thickening	X ₁	1	3	0.20	5	0.20	0.14	0.20	0.14	0.11	0.33	0.14	0.3595	2.0 %
Adherence to the travel schedule	X ₂	0.33	1	3	5	3	0.20	0.33	0.14	0.14	0.20	0.14	0.5081	2.8 %
Driver behavior	X ₃	5	0.33	1	5	5	5	5	0.14	0.14	5	0.14	1.2806	7.1 %
Recharging chip cards	X ₄	0.20	0.20	0.20	1	0.33	0.14	0.33	0.11	0.11	0.20	0.14	0.2147	1.2 %
Possibility of payment by mobile phone	X ₅	5	0.33	0.20	3	1	0.14	1	0.11	0.11	0.20	0.14	0.4067	2.3 %
Stops and shelters	X ₆	7	5	0.20	7	7	1	9	0.33	0.20	5	0.20	1.6230	9.0 %
Online ticket purchase	X ₇	5	3	0.20	3	1	0.11	1	0.14	0.11	0.20	0.14	0.4967	2.7 %
The ecology of travel	X ₈	7	7	7	9	9	3	7	1	0.33	5	0.20	3.0256	16.7 %
Cleanliness in the means of transport	X ₉	9	7	7	9	9	5	9	3	1	5	0.33	4.2436	23.5 %
Loyalty program	X ₁₀	3	5	0.20	5	5	0.20	5	0.20	0.20	1	0.20	0.9546	5.3 %
The price	X ₁₁	7	7	7	7	7	5	7	5	3	5	1	4.9541	27.4 %
												Total	18.067	100.0 %

Figure 7. Saaty's matrix—evaluation of criteria by selected companies. Source: own research.

The survey results are summarized in Table 5. The first option was increasing connections, which is important, i.e., necessary, for 127 respondents. It is less important for 89 respondents, most important for 69 respondents, and more important for with numbers 69 and 74 respondents. The second option, compliance with the travel schedule, is the most important for 113 respondents, but only 5 fewer respondents chose the value 3 for this option, i.e., important. The behavior of the driver is important for the respondents, as we can see from the evaluation of the question. Relatively equal numbers were obtained by the values 3 in the number of 110 respondents, 4 (92) and 5 (90). The behavior of the driver is not important for 22 respondents; we can assume that they are respondents who use public transport and may not come into contact with the driver. Recharging chip cards is not important at all for 65 respondents and less important for 93, which may be due to the fact that 221 respondents do not own a transport card.

Today, the modern and relatively ubiquitous mobile payment option is important for 113 respondents; the same number of respondents (73) rated this option as more important. Stops and shelters are important for 111 respondents, and a relatively equal number of 96 and 97 respondents chose an importance of 3 and 4 for this option. Online purchasing of tickets would be accepted by 253 respondents, who are divided into values of 3, 4, and 5, which are considered important or most important. Such an option in bus transport would save a lot of time when boarding passengers and would also be a more convenient option for passengers. The ecology of travel is perceived as important for 100 respondents, and it is more or less important for 67 and 82 respondents, respectively. The cleanliness of the means of transport is the most important for 139 respondents, and the other 236 respondents chose lower values. The loyalty program, which should pertain to certain discounts, is considered by 74 and 92 respondents to be an unimportant area. As for the price, it is a very important factor for up to 141 respondents.

Table 5. Areas of service improvement. Source: own research.

	1 (Least Important)	2	3	4	5 (Most Important)
increasing connections	27	89	69		74
compliance with the travel schedule	18	50	85		113
driver behavior	22	66	92		90
charging chip cards	65	93	67		38
possibility of payment by mobile phone	55	64	73		73
stops and shelters	26	61	96		111
online purchasing of travel tickets	47	69	81		70
ecology of travel	42	81	67		82
cleanliness of the means of transport	20	36	80		139
loyalty program	74	92	54		32
the price	26	56	69		141

As can be seen from the respondents' answers, the price is also the most important factor for customers, as is the cleanliness of the means of transport. In contrast to the bus transport companies, for which the ecology of travel is the third most important criterion, for customers, it is compliance with the timetable. The fourth most important criterion for customers is stops and shelters, followed by driver behavior and travel ecology. Based on the mentioned results and the findings of the questionnaire surveys, the weights of Saaty's matrix were determined.

4. Conclusions

The aim of the paper was to propose a concept for the customer's perspective of the BSC system for bus transport companies in the Slovak Republic, based on the analysis of customer requirements and the view of the management of bus carriers, with the aim of increasing their competitiveness. It is important to remember that high-quality public transport is required not only by the customer but also by the bus carriers themselves.

At the beginning of this contribution, we analyzed the theoretical knowledge of the problem being solved. We found that there are different service quality models that can be linked to the BSC concept. From our point of view, it would be interesting to connect the SERVQUAL model with the balanced scorecard. In addition to the customer's expectations, this model also monitors the customer's perception of the actual quality of the service. Such a connection could bring interesting results and a new view of the customer's perspective of the BSC system.

In this contribution, we brought the results of surveys focused on the customer as well as on transport companies. Data collection was carried out through a quantitative method—a questionnaire survey. The return of the questionnaires in both cases was sufficient to achieve relevant results.

We can state that customers expressed satisfaction with the means of transport that are used as well as with the services offered. As for the services, they would accept their improvement in the areas of price, cleanliness of the means of transport, compliance with the timetable, stops, and shelters. They would also welcome new additional services: Wi-Fi, online ticket purchasing, and the possibility of contactless payment. In terms of transport companies, we found that they do not use the BSC system. However, most bus companies conduct customer satisfaction surveys. They usually perform them on an annual basis. Customer satisfaction is a priority for businesses. However, the relationship between the size of the company and conducting surveys was not confirmed. Therefore, it is important to pay sufficient attention to the conducted surveys. It is important to focus on the source of the data, the available capacity of the company, and the intensity of the conducted surveys. Important decisions can subsequently be made based only on detailed analyses focused on these areas.

It is important to establish the hypotheses and research variables in such a way that they are related to consumer behavior, preferences, satisfaction levels, and company attributes. In order to evaluate the established hypotheses, we used non-parametric statistical methods (the Mann–Whitney test, Pearson’s test of independence, and Spearman’s correlation coefficient) in the paper. We are aware that the use of other methods can bring different results or a different view of the analyzed issue.

We also addressed suggestions and recommendations. The questionnaire surveys revealed areas that are important to both customers and bus transport companies. We transformed this knowledge through Saaty’s matrix into the design of the customer perspective of the BSC system for bus transport companies.

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