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## A new approach on the quality evaluation of tourist services

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### ABSTRACT

This paper emphasises how the quality of tourist services can be evaluated. The first part presents the best known models developed by specialists for service quality evaluation, then the authors created their own model. According to this model, a global quality evaluation indicator of tourist services was proposed, based on certain aspects of quality aimed by both the provider and the customer/consumer of tourist services. The calculus of this indicator was exemplified in the case of a Romanian tourist area, Vatra Dornei.

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L15; M19; Z39

## 1. Introduction

The continuous development of tourism in the recent past, its wide national and international expansion, and the advancement of the quantification methodology of tourist circulation have determined the tourism to be an extremely important phenomenon of the contemporary world, with deep economic, social, political, and cultural implications (Vujko & Gajic, 2014). Therefore, the presence of services in the structure of this national economy branch, their stimulatory role, their continuous development, and diversification, especially of those specific for tourism, require their study to be as thorough as possible, in order to learn about their adequacy and their functioning mechanisms.

The pre-occupations concerning service quality (Crosby, 1984), as well as the evaluation of the degree of accomplishment of customers' needs, are increasingly emphasised, knowing the fact that offering a service with a corresponding quality and a better price than the competitors' leads to the improvement of the activity, to the increase of the competitiveness and of the economic efficiency of the company (Wang, Jou, Chang, & Wu, 2014).

The quality of tourism companies, if stimulated and strictly oriented, is a very important strategic element, because it determines the highest level of competitiveness. The quality in services has imposed itself as conformity with the customer's demands (Bergman & Klefsjö, 1994). The companies make efforts in what concerns the improvement of service quality, being both an objective of service management and a strategy in their future development. Quality in the service area has two components: the servicing process quality, and the

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servicing quality level, meaning the real service that was offered. In what concerns the quality of tourist products, this can be evaluated by the consumer, using as reference indicators the price, the category of the transportation means, accommodation, or food establishment. Thus, in tourism, the concept of quality of tourist services means all the aspects concerning the tourist service quality, which is a very large area, where the consumer's and the operator's points of view meet. In this paper we intended to establish a possible calculus of a global quality evaluation indicator of tourist services, based on a specific opinion research realised with managers and customers.

There is a series of models trying to define service quality, where these each have their strengths and their weaknesses in defining and evaluating service quality. Some of these models are also applicable to tourism, but it is important for the people who work in the field of tourism to know which they are and how they can be used in order to obtain quality and customers' satisfaction (Dhurup, Venter, & Oosthuizen, 2005). Lately, there has been a growing international emphasis on the fact that tourism will be the surprise element helping most of the states to end the present crisis.

## 2. Literature review

Most of the studies and research activities in the field of service quality emphasise the fact that the basis of service quality evaluation is the customer's individual experience with a certain service. The research promoting this idea can be found in both the European school (more precisely, the Northern school), represented by Grönroos, Gummesson, Lehtinen and Olsen, and in the American school, represented by Parasuraman, Zeithaml and Berry (Balog & Badulescu, 2008).

First of all, we must mention that the service quality evaluation is different from the customers' satisfaction evaluation. Most of the specialists in the field of services agree that customers' satisfaction is a short-term measure specific to the operations made by the provider, while service quality is an attitude created by a general evaluation of the performance of the service provided by the company over the long-term.

The two main research instruments that have been developed over the years to analyse the concepts of quality and consumer satisfaction in the service industry are Importance-Performance Analysis (I.P.A.) and S.E.R.V.Q.U.A.L. I.P.A. is a procedure that shows the relative importance of various attributes, and the performance of the firm, product or destination under study in providing these attributes (Hudson, Hudson, & Miller, 2004). Its use has important marketing and management implications for decision-makers, and one of the major benefits of using I.P.A. is the identification of areas for service quality improvements. It has been applied to the hotel industry (Blešić et al., 2014; Bush & Ortinau, 1986; Martin, 1995), tourism policy (Chon & Olsen, 1990) and tourist destinations (Hudson & Shephard, 1998). S.E.R.V.Q.U.A.L. is an instrument developed by Parasuraman, Zeithaml, and Berry (1985), which focuses on the notion of perceived quality. It is based on the difference between consumers' expectations and perceptions of service. Exploratory research conducted in 1985 showed that consumers evaluate service quality by using the same general criteria, regardless of the type of service.

In the Grönroos model, service quality is determined by comparing the customer's expectations (what the customer feels and perceives that a service provider offers) with the real performance of the service provided. It divides the customer's perception into two dimensions: technical quality and functional quality (Grönroos, 1984; Lehtinen & Lehtinen, 1985).

In defining the model, Grönroos includes the dimension image of the company (represented by the attributes: reputation and credibility), and declares at the same time that the image has a substantial impact in different forms on the customer's perception of quality. A limit of the model elaborated by Grönroos is the fact that it does not offer an explanation on how functional and technical quality could be evaluated.

The model based only on performance, proposed by Cronin and Taylor (1994), operationalises quality and customers' satisfaction according to a single component called performance. On the basis of studies and empirical analyses, and also with the help of theoretical debates, the authors consider that the model of evaluation of quality and customers' satisfaction based on an instrument measuring only performance (S.E.R.V.P.R.E.F. model) has a greater power of explanation and validity than the models and the instruments based on the theory of unconfirmed expectations (models from S.E.R.V.Q.U.A.L. class) (Hudson et al., 2004). Besides, Cronin and Taylor (1988) consider that perception of high performance actually involves higher service quality. From a mathematical point of view, the S.E.R.V.P.R.E.F. model can be described as follows:

$$SQ = \sum_{j=1}^k P_{ij}$$

where SQ = perception of service quality; k = number of attributes or dimensions of the service; and P = individual perception (i, concerning the performance of attribute and j, of the service).

The service quality should be conceptualised and evaluated as an attitude. S.E.R.V.P.R.E.F., which is based on performance, is much more efficient than S.E.R.V.Q.U.A.L., because it reduces the number of items by 50%, and there are better results.

The model proposed by Berkley and Gupta (1994) can help the organisations understand the benefit of using an information system (I.T.) to provide an improved service quality. This model also helps managers understand the most utilised technologies in their industry, and to choose the ones corresponding to their needs. The model of I.T. alignment emphasises only I.T. impact on service quality, and does not offer a model of service quality evaluation and monitoring.

Dabholkar (1996) proposes two alternative models of service quality based on self-service technology. Self-service technology has become a method increasingly utilised by the managers in the hotel industry, due to labour high costs. The attribute-based model refers to what consumers would expect from such an option. The overall affect model is based on the consumers' feeling towards the use of technology.

The model proposed by Spreng and Mackoy (1996) shows that consumer satisfaction and service quality are two distinct elements and the understanding of customers' (consumers') wishes influences satisfaction. A key determinant of service quality and customers' satisfaction is to accomplish their wishes.

### 3. Purpose and objectives of empirical research

The purpose of the present research is to propose a quality evaluation indicator of tourist services.

The objectives established for reaching our purpose are as follows:

**O.1.** Highlighting the main models of measurement of service quality.

- O.2. Statistical modelling based on the frequency of the quality of tourist services.
- O.3. Development of a quality evaluation indicator of tourist services.
- O.4. Exemplification of the calculus for the indicator proposed.
- O.5. Validation of calculation of global indicator evaluating the quality of tourist services (G.Q.E.I.).

#### 4. Research methodology

In order to accomplish the intended purpose and objectives, both theoretical and practical methods have been applied during the research. The methods used in this research were varied and in accordance with the purpose and objectives established. These methods are (Doncean, 2009; Finn, Elliott-White, & Walton, 2000; Saunders, Lewis, & Thornhill, 2003; Zaiț & Spalanzani, 2006): the documentary research of local and foreign literature; the practical documentation and the gathering of information for the evaluation of quality of tourist services through field research based on statistical questionnaire; and the qualitative and quantitative analysis of the quality characteristics. The research area consists of a tourist area in Romania (Vatra Dornei), with a total of 39 managers of tourist structures and 109 tourists who were questioned. The information in the questionnaire was taken and processed using the S.P.S.S. 13.0 programmes for centralising the information, Excel – for the frequency table and for the polynomial equations used in the optimisation stage, MatLAB 7.0 for the calculus of the integers used in the elaboration of the global quality evaluation indicator of tourist services. The sample group was formed of: two target groups for Vatra Dornei tourist area: 39 managers of tourist accommodation structures (hotels, tourist and agro-tourist pensions) and 109 tourists, representing the total population present during the development of the research.

#### 5. Vatra Dornei, Romania – tourist destination. General presentation

Dorna Valley, rightfully called *Bucovina pearl*, is well-known for its beauties provided during centuries, for its high-quality products delivered to the marketplace (*La Dorna* milk and cheese, *Dorna* mineral water), for its rich pastures that determined the secular traditions of animal breeding, for its rich mineral water resources. Consequently, it would be better to emphasise the tourism and agri-tourism potential by a better involvement of the villages in the area.

The Dorna Basin spreads over an area of 222.194 km<sup>2</sup>, representing 0.63% of the area of the Eastern Carpathians and 0.093% of the total area of the country. Within this area there are 10 communes with 49 villages and two urban centres, represented by the towns Brosteni and Vatra Dornei, which belong to Suceava County from an administrative point of view.

The Dorna Basin has a wide range of attractions facilitating tourism development: the surrounding mountains, where one can go hiking on many tracks, the rivers forming wild quays (Cheile Zugrenilor on Bistrița River), their sinuous forests filling the air with ozone, the rich hunting fund, and many architectural monuments and historical objectives.

Such a potential, as well as the technical-material base, allowed the people to perform several types of tourism in the area, such as: mountain tourism, hunting tourism, sports tourism (skiing, paragliding, river-rafting), spa tourism and rural tourism (Tătărușanu & Niță, 2012).

Tourist activities, including a wide range of services: accommodation, meals, medical treatments, entertainment and so on, have an important contribution to the social-economic development of the Dorna Basin.

Consequently, tourism, beside the recreational and cultural effect that it has on the visitors, also generates new job opportunities, at the same time limiting migration or commuting towards other areas (Florian, 2011). The most important and visible impact is in the economical field. In the Dorna Basin, one can notice a development of the standard of living of the population practicing rural tourism. Having to meet the demands from the World Tourism Organisation, the inhabitants have been 'forced' to improve the infrastructure and the accommodation equipment, and, even more, to increase the number of rooms, in order to practice agri-tourism over the long-term. According to Pivcevic and Pranicovic (2012), beside the income and the increase of the standard of living, tourism encourages the development of traditional activities (crafts, handicrafts).

An important role is promoting rural tourism, which has developed very well in the last years in the Dorna Valley, has been played by various associations and organisations, such as: A.N.T.R.E.C., C.E.F.I.D.E.C., Mountain Farmers' Federation – *Dorna, Țara Dornelor* Foundation, and so on. These associations want to promote, organise and develop agri-tourism by training the owners of tourism and agri-tourism units (Cetină, Brandabur, & Constantinescu, 2006).

The oldest evidence showing the inhabitation of the Dorna Valley dates back to the age of unpolished stone, the territory being later owned by Dacians. The evolution, with continuous economic and social relationships, with a permanent exchange of values and governed by many influences from various nations with whom this people got in touch over time (Romans, Tatars and later Austrians) led to edification, during the next centuries, of a characteristic complex material culture, represented by vestiges that synthesise the interference and also by a social-economic life of an ancestral Dacian traditionalism that can be noticed even today in traditional crafts.

The social-cultural objectives of tourism interest can be grouped, by their specificity, as follows: architectural monuments, historical objectives, centres of folklore and popular art, museums and memorial houses (Țugulea, Bobalca, Maha, & Maha, 2013).

Among the architectural monuments one can notice the churches and the monasteries. Worth noticing are the wooden churches that represent the quintessence of the long evolution of wood civilisation, characteristic to the Carpathian regions. Such churches can be found in Iacobeni and Gheorghiteni villages, the latter dating from the eighteenth century.

Other churches that are famous for their age and architecture are: *Sfântul Nicolae* church in Broșteni, built during the reign of Petru Șchiopul (1586); *Adormirea Maicii Domnului* church in Rarău, built in the nineteenth century by the Balș family; and Cârlibaba church; the small and secluded convent from Piatra Tăieturii, Panaci commune.

The most important religious tourism objectives in Vatra Dornei are the Catholic Church, built in 1908; *Adormirea Maicii Domnului* church, built in 1678; the Jewish Temple, built in 1908; and, more recently, *Sfânta Treime* Cathedral, built in 1991.

Most of the historical objectives are concentrated in Vatra Dornei. The Florentine building of the City Hall located downtown – *The Communal Palace* – was built between 1896 and 1897. Nearby there is a monument dedicated to the Romanian heroes who died in the First World War (1914–1918), built out of white marble. Here, there is also a cross built out of black marble, a tribute to the heroes who died in December 1989.

In the park of the city there is the Casino building, designed by an architect from the Royal Court in Vienna and built in 1885 (today, it is being refurbished), the building at the water spring, the *Sentinel*, the Park Villa. The park is filled with statues of famous Romanians: Mihai Eminescu, I.L. Caragiale, Mihail Sadoveanu, Ciprian Porumbescu, George Enescu and Alecu Russo.

Not far from these statues is the new spa building. The Baroque style gives these buildings a special look. Close to the park of the city there are some newer hotels: Bradul, Călimani and Intus, with all the facilities: pool, gymnastics room, etc.

Other buildings in Vatra Dornei are: the Post Office; the railway station, built in 1910, the headquarters of the Mining Company, *Vasile Litu* high school, *Lăpuşneanu* Inn, Belvedere Villa, Cembra Villa (1985) and 'G.T. Kirileanu' library, built in 1901.

Other important historical monuments can be found in Cârlibaba – *Bogdan Vodă's Obelisk*, that shows the place where the ruler Bogdan Vodă, who was coming from Maramureş in 1359, got off the horse to rest. On the left bank of the Bistriţa River, at the bottom of Barnarel Mountain, there are the ruins of Chilia Inn, which was built during the reign of Alexandru Lăpuşneanu.

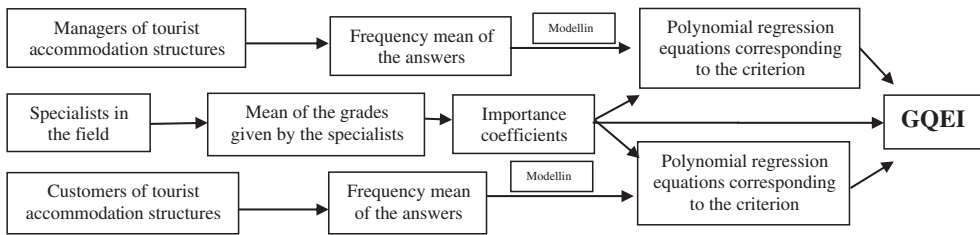
All these monuments are harmoniously combined with monuments of modern architecture representing cultural and social institutions organically integrated into the old urban centres.

## 6. Empirical research

### 6.1. *The specific model of the research development for obtaining the necessary information*

Two types of questionnaires have been elaborated for the two categories of subjects under research: managers of tourist accommodation structures and their customers. The questionnaire addressed to the managers was formed of 29 questions and the one addressed to the customers had 31 questions. For the quantification of the answers given by the managers, degrees of importance were used (from extremely important to not important at all) and also degrees of three-to-six categories of factors which the managers had also selected by their importance for different categories of tourist structures. The same method was used for establishing the evaluation degrees of customers' answers. In order to evaluate the quality of tourist services, 32 criteria have been taken into consideration, based on the legislation existing at present in our country (Romania), which are divided by three levels (sub-criteria). These characteristics have also been taken into account at the realisation of the questions from the two types of questionnaires. Each of the 32 criteria have been evaluated (with grades from 1 to 10) by specialists, at the end making the arithmetical mean for every criterion and sub-criterion with the purpose of establishing the coefficient of importance ( $CI_i$ ) used in the calculus of the global quality evaluation indicator of tourist services (G.Q.E.I. – Global Quality Evaluation Indicator). The 32 criteria (sub-levels) of quality have been extracted from the three questions present in both types of questionnaires, as follows: (1) Aspects concerning the choice of the tourist accommodation structure; (2) Quality of tourist services offered; and (3) Overall service quality.

The logical diagram of the stages concerning the overall research development is presented in Figure 1.



**Figure 1.** Stages concerning the establishment of global quality evaluation indicator of tourist services (G.Q.E.I.). Source: © the author.

In the first stage, in order to establish the calculus of the global quality evaluation indicator of tourist services, the quality level of certain characteristics of tourist services from tourist accommodation structures of Vatra Dornei area has been modulated, and 10 specialists in the field of tourism have been asked to evaluate the 32 criteria (sub-levels) of quality, extracted from the three questions that are present in both types of questionnaires, with the help of a grading system from 1 to 10. In the second stage, based on the evaluation grades from 1 to 10 obtained from the specialists, the arithmetical mean has been calculated for each criterion and sub-criterion (quality sub-levels), with the purpose of establishing the coefficients of importance ( $CI_i$ ) used to calculate the global quality evaluation indicator of tourist services (G.Q.E.I.).

In Table 1 we present the 32 quality aspects/criteria on the three quality sub-levels and the mean of the evaluation grades (32 grades) given by the specialists.

Criteria and sub-criteria have a parallel chaining; therefore, a random coefficient of importance represents a multiplication of the lower-level sub-criteria.

In order to exemplify the calculus of the coefficients  $CI_i$  we present in Table 2 the calculus of the coefficient of importance  $CI_2 = 0.33$ , which appears in Table 1.

## 6.2. Statistical modelling based on the frequency of the quality of tourist services

The following step involved the calculus of the frequency mean of the answers to the three questions addressed to both managers and customers of tourist accommodation structures concerning the service quality for the Vatra Dornei tourist area. For these answers we used the following grading system:  $A_{ij}$  factor, where  $i$  is the research area (Vatra Dornei) and  $j$  represents the quality levels, five levels from 1–5, respectively (1 = very satisfied, 2 = satisfied, 3 = neither satisfied, nor dissatisfied, 4 = dissatisfied, 5 = very dissatisfied or ‘I do not know, I will not answer’); The  $A_{ij}$  factor of evaluation of the quality of services had eight levels (1 = exterior aspect, 2 = location, 3 = name and reputation, 4 = ambience etc.).

On the basis of these results, we could realise the modelling of the frequency mean, obtaining the polynomial equations necessary for the establishment of the global quality evaluation indicator of tourist services.

In the first stage, by processing the values of Table 3 in E.X.C.E.L., we obtain a graph with modelling the frequency mean of the answers received at the question referring to service quality evaluation (managers vs customers). The graph points represent the values selected from Table 3. On the O.X. axis of coordinates, the answer variants were represented



**Table 1.** Establishment of coefficients of importance according to the grades given by the specialists.

No	Criterion and CI (M – managers, C – customers)	Sublevels			Mean of the grades (1 ... 10)	Coefficients of importance on sub-levels		Final coefficient of the regression equation $C_i$
		1	2	3		CI	$C_i$	
1	1. M/C How important are for you the following aspects related to the choice of the accommoda- tion structure (hotel, pension, others)? $C_1$ = 0.43	Exterior aspect			9.0		0.43	
2		Location			9.7			
3		Name and reputation			8.8			
4		Ambience			9.5			
5		Services provided			9.3			
6		Diversity and quality of the menu			8.7			
7		Prices			8.7			
8		Other improvements and endowments			8.5			
9	2. M/C How important are for you the following aspects regarding the quality of tourist services that are offered? $C_2$ = 0.33	Spatial quality			8.2	0.62	0.33	
10		Access facilities			8.8			
11		Clarity of the signs (signposts)			8.9			
12		Parking facilities Possibilities offered by the environment of the accommodation unit			9.7			
13	Quality of the choice	Diversity of options (different types of rooms, each with specific ambience)			8.9	0.86		
14		Variety of services						
15	Quality itself	Material parameter (5 types of norms are taken into account)			9.7	0.74	0.73	
16		Material norms			9.1			
17		Utilisation norms			9.5			
18		Maintenance norms			9.2			
19		Cleanliness norms			9.6			
20	Relational quality	Security norms			9.7	0.99	0.87	
21		Personnel availability			9.9			
22		Direct (employed per- sonnel – customer) Indirect (customer – customer)			10.0			



**Table 1.** (Continued).

No	Criterion and CI (M – managers, C – customers)	Sublevels			Mean of the grades (1 ...10)	Coefficients of importance on sub-levels		Final coefficient of the regression equation $C_i$
		1	2	3		CI	$C_i$	
23	3. M/C How do you evaluate the quality of the services on the whole? $C_3 = 0.39$	Front-desk operators	To establish a visual contact from the very entrance of the customer into the hotel, not just at the desk-office		9.4	0.75	0.39	
24			To address the custom- er on the name		8.8			
25			To use positive and polite words		9.9			
26			To greet the customer		9.4			
27			To be always attentive and ready to offer their help		9.8			
28		Porters	To smile		9.4	0.78		
29			To establish a visual contact		8.9			
30			To greet the customers every time		9.4			
31		Room maids			8.4	0.84		
32		Bar/ Restaurant			8.0	0.80		

Source: © the author.

**Table 2.** Exemplification of the calculus of the coefficient  $CI_2$ .

Value of the general criterion	Sub-criteria (sub-levels)		
	1	2	3
Final $CI_2 = CI_{21} \times CI_{22} \times CI_{23} \times CI_{24} = 0.62 \times 0.86 \times 0.73 \times 0.87 = 0.33$	$CI_{21} = 0.62$ $CI_{22} = 0.86$	$CI_1 = 0.74$ $CI_2 = 0.99$	
	$CI_{23} = 0.73 = CI_1 \times CI_2$		
	$CI_{24} = 0.87$		

Source: © the author.

by X.O.Y. at the question for which we used the notation 1, 2, 3, 4, 5, etc., and the O.Y. axis represented the frequency means (weights), for each of the  $n$  answer variants.

In the following stage, we modelled the distribution of the points according to a polynomial function of degree  $n$ , such as  $R^2$  (root mean square deviation) tends to +1. With the help of the E.X.C.E.L. program we found a curve reaching all the points, which can be very far from the real curve that reaches other points. Finding a curve which gets closest to the experimental curve was performed by polynomial adjustment. The degree of the polynomial adjusting of the real distribution depends on the number of experimented points. If  $n = 5$ , then the polynomial is of degree 4. The graphs were performed in order to obtain a regression equation used in the calculation of G.Q.E.I. As a measure of a tourist service quality we can use the mean of the evaluations. In order to eliminate the extremes (maximum or minimum evaluation), we used the area limited by the experimental curve, which is approximated by the adjusted curve. The values of Table 3 are presented in the graph from Figure 2.

Using the procedure described above, we present in Table 4 the frequency mean of the managers' (M) and customers' (C) answers concerning the quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area, and Table 5 presents the frequency mean of the managers' (M) and customers' (C) answers concerning the global quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area. Figures 3 and 4 present the modelling of frequency mean for the criteria established in Tables 4 and 5.

In Table 6 we present the polynomial equations obtained by modelling the frequency mean of the answers to the questionnaire applied to the managers of tourist accommodation structures and also to their customers.

### **6.3. Methods used to establish the calculus of the global quality evaluation indicator of tourist services (G.Q.E.I.)**

In the first stage, third and fourth degree polynomial equations obtained as a result of the frequency modulation of the answers presented in Table 2 were integrated and solved with the help of the MatLAB 2007 program.

Sequence MatLAB for calculating G.Q.E.I.:

% importance coefficients;

$CI_1 = 0.43$ ;  $CI_2 = 0.33$ ;  $CI_3 = 0.39$ ;

% integration field [1-3]

$x = [1:3]$

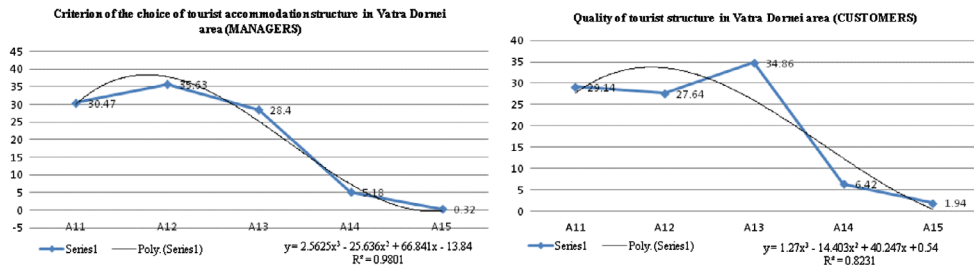


**Table 3.** Frequency mean of the managers' (M) and customers' (C) answers concerning the choice of tourist accommodation structures in the Vatra Dornei tourist area.

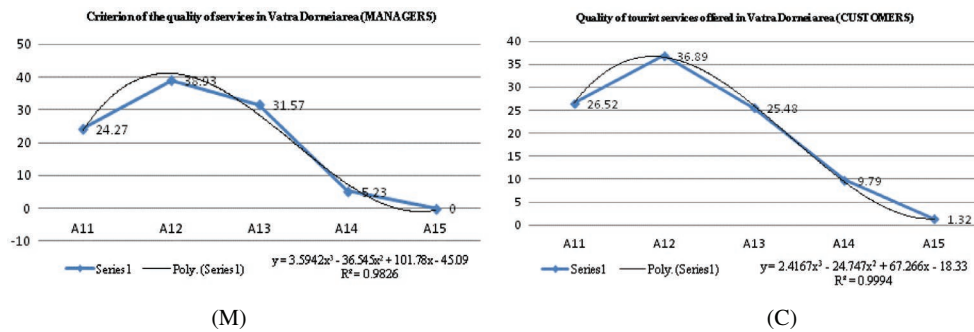
$A_j$ factor	Exterior aspect		Location		Name and reputation		Ambience		Services offered		Diversity and quality of the menu		Prices		Other improvements and endowments		Frequency mean	
	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C	M	C
$A_{11}$	25.6	16.5	35.9	25.7	25.6	17.5	30.8	30.3	56.4	44	28.2	41.3	30.8	47.7	10.5	10.1	30.47	29.14
$A_{12}$	43.6	28.4	38.5	19.3	46.2	26.6	48.7	33	33.3	42.2	38.5	24.8	17.9	18.4	18.4	28.4	35.63	27.64
$A_{13}$	30.8	35.8	23.1	48.6	17.9	27.5	20.5	34.9	10.3	13.8	28.2	32.1	38.5	33.9	57.9	52.3	28.4	34.86
$A_{14}$	0	19.3	2.6	4.6	7.7	16.5	0	0	0	0	5.1	1.8	12.8	0	13.2	9.2	5.18	6.42
$A_{15}$	0	0	0	1.8	2.6	11.9	0	1.8	0	0	0	0	0	0	0	0	0.32	1.94

Significance:  $A_{11}$ , Vatra Dornei area, variant of answer '1';  $A_{12}$ , Vatra Dornei area, variant of answer '2', etc.

Source: © the author.



**Figure 2.** Modelling of the results for the criterion concerning the choice of tourist accommodation structure in the Vatra Dornei tourist area and polynomial equations corresponding to this criterion. Source: © the author.



**Figure 3.** Modelling of the results for the criterion of the quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area and corresponding polynomial equations. Source: © the author.

**Table 4.** Frequency mean of managers' (M) and customers' (C) answers concerning the quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area.

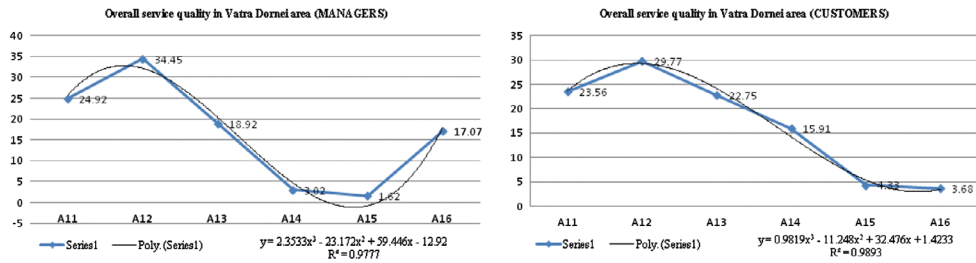
A <sub>ij</sub> factor	Spatial quality		Quality of the choice		The quality itself		Direct relational quality		Frequency mean	
	M	C	M	C	M	C	M	C	M	C
A <sub>11</sub>	14.41	21.71	21.8	22.95	33.32	35.76	27.56	25.7	24.27	26.52
A <sub>12</sub>	34.47	44.06	38.5	31.15	42.33	40.26	40.42	32.1	38.93	36.89
A <sub>13</sub>	43.61	27.83	32.0	27.55	23.06	22.7	27.55	23.85	31.57	25.48
A <sub>14</sub>	7.51	5.8	7.7	16.5	1.29	1.28	4.47	15.6	5.23	9.79
A <sub>15</sub>	0	0.6	0	1.85	0	0	0	2.75	0	1.32

Significance: A<sub>11</sub>, Vatra Dornei area, variant of answer '1'; A<sub>12</sub>, Vatra Dornei area, variant of answer '2', etc. Source: © the author.

**Table 5.** Frequency mean of managers' (M) and customers' (C) answers concerning the overall quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area.

Factor A <sub>ij</sub>	Front-desk		Porters		Room maids		Bar		Restaurant		Frequency mean	
	M	C	M	C	M	C	M	C	M	C	M	C
A <sub>11</sub>	32.32	36.72	26.47	20.8	15.4	13.8	12.8	12.8	37.62	33.7	24.92	23.56
A <sub>12</sub>	45.74	31.56	35.03	20.2	20.5	37.7	33.3	23.9	37.62	35.47	34.45	29.77
A <sub>13</sub>	13.74	19.42	28.2	27.2	23.1	16.5	10.3	25.7	19.16	24.91	18.92	22.75
A <sub>14</sub>	6.16	10.28	6.83	23.26	0	21	0	21.1	2.15	3.92	3.02	15.91
A <sub>15</sub>	2.04	2.02	0.87	8.54	0	1.8	2.6	7.3	2.58	2	1.62	4.33
A <sub>16</sub>	0	0	2.6	0	41	9.2	41	9.2	0.87	0	17.07	3.68

Significance: A<sub>11</sub>, Vatra Dornei area, variant of answer '1'; A<sub>12</sub>, Vatra Dornei area, variant of answer '2', etc. Source: © the author.



**Figure 4.** Modelling the frequency mean concerning the overall quality of tourist services offered by tourist accommodation structures in the Vatra Dornei tourist area and corresponding polynomial equations. Source: © the author.

**Table 6.** Regression equations for managers and customers for each criterion.

Criterion and C.I.	Equations for Vatra Dornei area - $Y_{VD}$ , under the form: $Y_{ic(a) area} = ax^4 + bx^3 + cx^2 + dx + e, i = 1, 2, 3.$	
	M	C
1. M/C How important are for you the following aspects related to the choice of the accommodation structure (hotel, pension, others)? $Cl_1 = 0.43$	$Y_{1mVD} = 2.5625x^3 - 25.636x^2 + 66.841x - 13.84$	$Y_{1cVD} = 1.27x^3 - 14.403x^2 + 40.247x + 0.54$
2. M/C How important are for you the following aspects regarding the quality of tourist services that are offered? $Cl_2 = 0.33$	$Y_{2mVD} = 3.5942x^3 - 36.545x^2 + 101.78x - 45.09$	$Y_{2cVD} = 2.4167x^3 - 24.747x^2 + 67.266x - 18.33$
3. M/C How do you evaluate the overall service quality? $Cl_3 = 0.39$	$Y_{3mVD} = 2.3533x^3 - 23.172x^2 + 59.446x - 12.92$	$Y_{3cVD} = 0.9819x^3 - 11.248x^2 + 32.476x + 1.4233$

M, managers; C, customers.  
Source: © the author.

% functions subject to the saved integration separated by the extension .m according to the following sequence:

$$Y_{1cVD} = [0 \ 1.27 \ -14.403 \ 40.247 \ 0.54]$$

$$Y_{1mVD} = [0 \ 2.5625 \ -25.636 \ 66.841 \ -13.84]$$

$$Y_{2cVD} = [0 \ 2.4167 \ -24.747 \ 67.266 \ -18.33]$$

$$Y_{2mVD} = [0 \ 3.5942 \ -36.543 \ 101.78 \ -45.09]$$

$$Y_{3cVD} = [0 \ 0.9819 \ -11.248 \ 32.476 \ 1.4233]$$

$$Y_{3mVD} = [0 \ 2.3533 \ -23.172 \ 59.446 \ -12.92]$$

function  $y = myfun(x)$

$$y = (1.27*x.^3 - 14.403*x.^2 + 40.247*x + 0.54);$$

$$y = (2.5625*x.^3 - 25.636*x.^2 + 66.841*x - 13.84);$$

$$y = (2.4167*x.^3 - 24.747*x.^2 + 67.266*x - 18.33);$$

$$y = (3.5942*x.^3 - 36.543*x.^2 + 101.78*x - 45.09);$$

$$y = (0.9819 \cdot x.^3 - 11.248 \cdot x.^2 + 32.476 \cdot x + 1.4233);$$

$$y = (2.3533 \cdot x.^3 - 23.172 \cdot x.^2 + 59.446 \cdot x - 12.92).$$

In the second stage, the results obtained as a result of the integration were used to determine the value of the global quality evaluation indicator of tourist services (G.Q.E.I.) calculated for each segment of the research area. The method for G.Q.E.I. calculus that can be used was the method of the correlation of the area limited by the polygon of the mean frequency concerning the quality of tourist services desired by the customers with the area corresponding to the economic agents. According to this method, G.Q.E.I. is proposed to be calculated with:

$$GQEI_{area} = \sum_1^3 CI_i \cdot \frac{\int_1^n Y_{ic\ area}(x) \cdot dx}{\int_1^n Y_{ia\ area}(x) \cdot dx} = \frac{required\ quality}{offered\ quality} \tag{1}$$

where:

$GQEI_{area}$  = global quality evaluation indicator of tourist services calculated for the Vatra Dornei area;  $CI_i$  = the coefficient of importance (the specialist’s evaluation) of the three criteria common to customers (C) and managers (M);  $Y_{ic\ area}$  = the polynomial equation for the customers of that area (the customer’s evaluation concerning the quality of tourist services offered by tourist accommodation structures);  $Y_{ia\ area}$  = the polynomial equation for the economic agents of the research area (the manager’s evaluation concerning the quality of tourist services demanded by the customer);  $1 \dots n$  = the integration interval according to the value levels (qualitative criteria or variants of answers); and  $\frac{\int_1^n Y_{ic\ area}(x) \cdot dx}{\int_1^n Y_{ia\ area}(x) \cdot dx}$  is the ratio of the areas between the limits [1 ... n] of the criterion ‘i’ common to customers (c) and economic agents (a) belonging to the same tourist area (VD);

$$GQEI_{VD} = CI_1 \cdot \frac{\int_1^5 Y_{1c\ VD}(x) \cdot dx}{\int_1^5 Y_{1a\ VD}(x) \cdot dx} + CI_2 \cdot \frac{\int_1^5 Y_{2c\ VD}(x) \cdot dx}{\int_1^5 Y_{2a\ VD}(x) \cdot dx} + CI_3 \cdot \frac{\int_1^5 Y_{3c\ VD}(x) \cdot dx}{\int_1^5 Y_{3a\ VD}(x) \cdot dx} \tag{2}$$

**6.4. Validation of the global quality evaluation indicator of tourist services (G.Q.E.I.) proposed**

At the balance, when the areas calculated both for the customers and for the economic agents are equal, i.e., the customers’ demand is equal to the tourism economic agent’s offer, then the ratio between the areas is 1.

That means that the value of the indicator is given by the sum of the coefficients of importance, as follows:

$$GQEI = CI_1 + CI_2 + \dots + CI_m = \sum_1^m CI_i \tag{3}$$

where m is the number of criteria which are taken into consideration.

In the case of this specific research, G.Q.E.I. at the balance has the following value:

$$GQEI = CI_1 + CI_2 + CI_3 = 0.43 + 0.33 + 0.39 = 1.15 \quad (4)$$

We mention that the calculus of  $CI_i$  coefficients is presented in Table 2.

For  $G.Q.E.I. > 1.15$ , the customers' demands are more than what the tourism economic agent could offer.

For  $G.Q.E.I. < 1.15$ , the tourism economic agent offers tourist services of superior quality, more than the level of the customers' demands.

There are two situations when G.Q.E.I. can take values, as follows:

(1) If all the specialists gave the highest grade, i.e., 10, then the sum of the coefficients of importance would be 1 (one), as follows:  $CI_1 + CI_2 + CI_3 = 1$ ; in this situation, at the balance, when the areas calculated both for the customer and for the economic agent are equal (which means that the customers' demand is equal to the tourism economic agent's offer), the ratio between the areas is 1. That means that the maximum value of the indicator is given by the relation:  $GQEI^{\max} = \sum_1^m CI_i = m$ , where  $m$  is the number of criteria taken into consideration. In the case of this specific research, with  $m = 3$ , it results:  $GQEI^{\max} = \sum_1^m CI_i = CI_1 + CI_2 + CI_3 = 1 + 1 + 1 = 3$ .

(2) If all the specialists gave the minimum grade, i.e., 1, then the coefficients of importance would have the following values:  $CI_1 = CI_2 = \dots = CI_m = 0 + 0 + \dots + 0 = 0$ . In the case of this specific research, for  $m = 3$  we have:  $CI_1 + CI_2 + CI_3 = 0$ . At the balance, when the calculated areas both for the customer and for the economic agent are equal, which means that the customers' demand is equal to the tourism economic agent's offer, the ratio between the areas is 1, which, multiplied by the value 0 (zero) of the coefficients of importance, will give the minimum value of the global quality evaluation indicator, as follows:  $GQEI^{\min} = \sum_1^m CI_i = 0$ . In the specific case of this research we will have:  $GQEI^{\min} = CI_1 + CI_2 + CI_3 = 0 + 0 + 0 = 0$ .

As a result, in this specific situation, the G.Q.E.I. variation interval is:  $GQEI = [GQEI^{\min}; GQEI^{\max}] = [0; 3]$ . If we generalise, taking into account the  $m$  criteria, according to this method, the G.Q.E.I. variation interval is as follows:  $GQEI = [GQEI^{\min}; GQEI^{\max}] = [0; m]$ . The results obtained after solving the integers with the help of the MatLAB 2007 program for G.Q.E.I. of tourist services per areas are:  $GQEI_{VD} = 1.1517$ .

Sequence MatLAB for the values of calculated integrals:

G.Q.E.I. is calculated for the Vatra Dornei area:  $Y_{1cVD} = 81.9716$ ;  $Y_{1mVD} = 84.7943$ ;  $Y_{2cVD} = 83.9010$ ;  $Y_{2mVD} = 89.7885$ ;  $Y_{3cVD} = 74.0407$ ; and  $Y_{3mVD} = 70.5082$ .

% the values of integrals are divided:  $Y_{1mcVD} = Y_{1cVD}/Y_{1mVD}$ ;  $Y_{2mcVD} = Y_{2cVD}/Y_{2mVD}$ ; and  $Y_{3mcVD} = Y_{3cVD}/Y_{3mVD}$ .

The result is the integrals ratio:  $Y_{1mcVD} = 0.9667$ ;  $Y_{2mcVD} = 0.9895$ ; and  $Y_{3mcVD} = 1.0501$ .

$GQEI_{VD} = CI_1 * Y_{1mcVD} + CI_2 * Y_{2mcVD} + CI_3 * Y_{3mcVD} = 0.43 * 0.9667 + 0.33 * 0.9895 + 0.39 * 1.0501 = 1.1517$

Therefore,  $GQEI_{VD} = 1.1517$

According to the result of the calculations presented in the model proposed, G.Q.E.I. measures the ratio between demand (customers) and offer (economic agents), according to the same questions from the questionnaire. In the Vatra Dornei area the quality of tourist



services offered by the economic agents should be improved. As compared to the ideal situation, the index of the indicator level as a percentage is as follow:

$$\text{Vatra Dornei: } GQEI\% = \frac{GQEI^{real}}{GQEI^{max}} \cdot 100 = \frac{1.1517}{3.00} \cdot 100 = 38.39\% \quad (5)$$

Taking into account the result obtained by reporting the real value equal to 1.1517 to the ideal value of G.Q.E.I. equal to 3, we can estimate that, in the Vatra Dornei tourist area, the managers offer a quality of tourist services equal to 38.39% of the ideal value. This result was obtained taking into account the 32 criteria presented in Table 1, as well as the frequency means from Tables 3–5.

### **6.5. The importance of the evaluation method**

The calculation methodology proposed takes into account the evaluation of the criteria in relation with:

- Customers' evaluation;
- Managers' evaluation; and
- Grades given by specialists.

The algorithm proposed leaves space to add other criteria and to complete the model, taking into account the complexity of the tourist system.

We believe that this indicator might be englobed in the life quality indicator.

## **7. Conclusions, discussions and research limits**

The results obtained from the research allow us to formulate some conclusions.

Thus, we noticed that the models developed by most specialists are based on the evaluation of a service quality according to the customer's individual experience with that particular service, and they have in view two dimensions: cognitive dimension and affective dimension (Seth & Deshmukh, 2005). According to them, service quality can be evaluated only by consumers after the service consumption and according to their perception of that particular service (Shemwell, Yavas, & Bilgin, 1998). In what concerns the measurement of service quality, most models do not offer an explanation on how it could be realised/quantified.

By the indicator proposed, we took into consideration the customers' opinion of service quality and we also considered the opinion of the specialists in the field and of providers of those particular services concerning the quality offered. In our case, service quality is given by the ratio of the quality demanded by the customer and the quality offered by the provider. Both the quality demanded and the quality offered are based on the same quality aspects.

Analysing the polynomial equations obtained from modelling the frequency mean, we noticed that there were significant differences between the two categories of subjects (managers and customers). It is obvious that tourist service quality perceived by customers is lower than the one offered by the managers. Also, by using the calculus relation of the G.Q.E.I., the calculus shows that its value is 1.1517, which is below the average tourist service quality offered in the Vatra Dornei tourist area. We also estimate that the value of

the indicator G.Q.E.I. = 1.1517 highlights a great difference from the ideal situation, when the value of the global quality indicator would be equal to 3, and all criteria would get a maximum value.

By comparing the ideal maximum value to 3, we could estimate that there is a difference equal to 1.8483, a result which could be interpreted as a lack of quality. On the other hand, the value of 1.1517 reflects the real situation of the quality of tourist services demanded by customers and offered by tourist accommodation structures in the Vatra Dornei tourist area. Consequently, according to the results obtained, G.Q.E.I. = 1.1517, managers should improve tourist service quality. At the service quality evaluation, by applying the global quality evaluation indicator, this should approach the ideal value, G.Q.E.I. = 3.

In conclusion, from a strategic and operational point of view, managers of tourist accommodation structures should act in order to improve the quality of tourist services in order to increase the level of the global quality indicator as compared to the ideal maximum value. Consequently, there will be a harmonisation of customers' demands concerning quality with what they are offered by tourist accommodation structures.

### 7.1. Research limits

Due to the complexity of the questionnaire, we intended to form the most representative sample for the research area. The results obtained are also influenced by the subjective measurement of the concept of tourist service quality. We noticed the respondents' tendency to give high grades for certain levels of quality of tourist services included in the research. In reality, tourists are very demanding persons when we take into account, for example, the ratio quality/price. In this case, managers should make higher efforts to increase the quality level of tourist services offered, such as the ratio quality/price be in direct proportion with tourists' expectations.

### Disclosure statement

No potential conflict of interest was reported by the authors.

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