CLUSTER ANALYSIS AS A TOOL OF GUESTS SEGMENTATION BY THE DEGREE OF THEIR DEMAND

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Authors demonstrate the use of cluster analysis in finding out (ascertaining) the homogenity/heterogenity of guests as to the degree of their demand. The degree of guests' demand is defined according to the importance of perceived service quality components measured by SERVQUAL, which was adopted and adapted, according to the specifics of health spa industry in Slovenia. Goals of the article are: (a) the identification of the profile of importance of general health spa service quality components, and (b) the identification of groups of guests (segments) according to the degree of their demand in the research in 1991 compared with 1999. Cluster analysis serves as useful tool for guest segmentation since it reveals the existence of important differences in the structure of guests in the year 1991 compared with the year 1999. The results serve as a useful database for management in health spas.

1. INTRODUCTION

According to data from various formal statistical sources services industries have an enormous impact on the national economic growth of countries world-wide.

In Slovenia, the contribution of services industries to GDP is growing as well. It has grown from 52.8% in 1990 to 58.9% in 1999. Their importance is also reflected from employment data. Namely, the growth of employment in the period from 1991 to 1996 was 9% and this trend continues. From May 1997 to May 2000 the percentage of all employed people in Slovenia in the service industries has grown from 49.6 to 54% (Statistični letopis R Slovenije, 2000).

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Services exports are well over imports in Slovenia, therefore their contribution to the equilibrium of balance of payments shouldn't be neglected as well. However in the years 1997 and 1998 the growth of services exports from Slovenia had been slowing down (Banka Slovenije, 1999).

Tourism is despite its slightly diminishing sales in the last few years one of the most important services industries for Slovenian economy (Banka Slovenije, 1999). Its share in the overall services exports from Slovenia has grown from 31% in 1990 to 57% in 1997 (Banka Slovenije, 1999).

According to the business results health spas in Slovenia represent a great potential for contribution to the GDP of Slovenia. In the 1990s and especially in the last few years health spa tourism in Slovenia has been booming (Ogorelc, Snoj, 1998: 39).

Measured by the number of overnight stays in all types of accommodation, the health resort industry (15% of the overall accommodation) represents a vital part of the tourism industry. In 1999 it amounted to 23% of all foreign and 44% of all domestic stays. As to the share of the total number of tourists in Slovenia, health spas contributed 33% (Skupnost slovenskih naravnih zdravilišč, 2000). Compared to other tourist services the share of expenses for the medical services in which health spas play the major role was 12% in the overall tourist expenditures in Slovenia (Ogorelc, Snoj, 1998: 41).

Reason for the research was to contribute to the conceptual efforts of Klaus, Zeithaml, Parasuraman, Berry, Lovelock, Brown and others in studying the complex nature of the service quality issue and in this context to show how the cluster analysis could serve as powerful tool to bring a view to the structure of data.

The empirical study of the importance of service quality dimensions from the generally accepted service quality model, proposed by Parasuraman, Zeithaml, and Berry (1985), in the health spa industry in Slovenia was undertaken. The health spa industry was chosen for several reasons:
❑ The management in tourist resorts in Slovenia has not been given enough professional attention to services quality at all;
❑ Health spa services are undoubtedly an integral part of the overall tourist experience with the tourist destination (La Lopa, Marecki, 1999: 399);
❑ Perceived quality and value of services are among the most important factors in the guest choice of a particular tourist destination (Ogorelc, Snoj, 1998: 38).

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Goals of the study, stressed in this article, were:
- ❑ the identification of profile of importance of general health spa service quality components,
- ❑ the identification of groups of guests (segments) according to the degree of their demand in the research in 1991 compared with 1999.

2. METHODOLOGY

2.1. Instrument

In doing this project authors repeated a part of the research done by Snoj in 1991 (Snoj, 1995: 95-105). In the assessment of the importance of health spas service quality components the questionnaire from Snoj's 1991 study was used. It was developed on the basis of a list of service quality attributes derived from SERVQUAL (Parasuraman, Zeithaml, Berry, 1986, 1988), which was slightly corrected by using the most commonly used components of service quality in service marketing literature (Snoj, 1995: 96).

The questionnaire measured the importance of 23 components of health spas service quality classified in generally used SERVQUAL five dimensions (Table 1). Despite criticism of its general applicability in measuring perceived service quality, SERVQUAL is a concise multiple-item scale with good reliability (Lewis, Michell, 1990) and has been widely accepted as a valid instrument in the measurement of service quality (Carman, 1990; Fisk, Brown, Bittner, 1993. In Kandampully, 1998: 433).

Durvasula, Lysonski, and Mehta (1999: 133) in their critical review of SERVQUAL instrument conclude that what managers want from measures foremost is the information to guide action plans rather than simply an indication of good or bad service quality and SERVQUAL for all its weaknesses does provide such a guide.

We used this scale also for its quality of dealing with the emotional bond created through personal interaction of service providers and consumers. This bond is essential for professional services and among them medical services which form an important group of health spa services (Kandampully, 1998: 437).

The importance of each of the service quality components was measured using five-point scale from "1 = not important at all" to "5 = very important".

Table 1. Quality components in five dimensions

Services quality dimensions	Services quality components
1. **Tangibles**	1. The condition of facilities, equipment and surroundings, 2. The adjustment of facilities, equipment and surroundings with the type of services provided, 3. The heterogeneity of facilities, equipment and surroundings according to the type of services provided, 4. The location of the health spa, 5. Sleeping, 6. Food and beverages, 7. Medical and other professional programmes, 8. Entertainment, 9. Recreation, 10. Price ranges and terms of payment, 11. Other guests, 12. Employees' appearance,
2. **Reliability**	13. Employees' professionalism, 14. Reliability of services, 15. The employees' knowledge of the assortment of health spa services, 16. Availability, clearness and fairness of information,
3. **Responsiveness**	17. Employees' overload, 18. Promptness of service implementation
4. **Assurance**	19. Health spa image, 20. Physical safety of guests and security of their valuables, 21. Management support in solving problems,
5. **Empathy**	22. Employees' capacity to recognize the needs of their guests, 23. Employees' commitment to the comfort of their guests.

2.2. The structure of guest population and sample

The resorts included in the research is located in Slovenia and have a long tourist tradition, going back to the middle of the nineteenth century. Very soon, they started developing medicine programmes. The resorts offer special health care programmes on the basis of thermal and mineral water. The basic medicine programme of the resort A is the treatment of heart, veins and locomotive organs. Since the beginning of 90s - after the attainment of independence of Slovenia and the transition to market economy in 1991 - they have renewed the existing health-care programmes and developed new programmes, namely, prevention health-care, herbal remedy programmes, fitness programmes,

balneography, hydrotherapy, various baths, saunas, stop-smoking programmes, relaxation techniques, vitamin complex treatments, dietary programmes, beauty treatments and recreational activities.

The structure of guests in health spas under consideration vary from traditional guests receiving health treatments, general business people and conference participants to young families on holidays. Their main target group is the middle-class guests. They also want to increase the numbers of foreign tourists especially from neighbouring countries. Recently the guests' profile has been changing. As the result the proportion of the guests receiving treatment is decreasing, the average age is getting lower and the social structure is changing as well.

In both 1991 and 1999 research the sample of respondents was chosen from guests who met the following criteria:
❑ at least a 5 night stay in the health spa,
❑ being guest of the hotel of the highest class (4 to 5 stars), and
❑ already passed doctors examination.

In 1991 at the time of primary data collection there were 1118 high class hotel guests in both health spas. Out of them 572 spent already at least 5 nights and passed medical examination. From this population 175 guests actively participated in our research. In 1999 at the time of primary data collection there were 648 high class hotel guests in both health spas. Out of them 402 spent already at least 5 nights and passed medical examination. From this population 145 guests actively participated in our research.

2.3. Procedure

Primary data was collected through personal interviews in which trained interviewers helped each of the guests in completing a written questionnaire under the condition that complete intimacy and anonymity was guaranteed.

3. RESULTS AND DISCUSSION

The results reveal that the sample of guests in 1991 assessed almost all components of health spa service quality as statistically more important in comparison to the assessment of the sample of guests in 1999. There are only two exceptions: "entertainment" and "guests in health spa", where statistically important differences in mean scores do not exist.

Table 2. Comparison of importance of the assessed quality service components

Components	Mean 1991	Mean 1999	T (p)	Rank 91	Rank 99	D 91-99
Recreation	4,0994	3,7986	**	21	6	+ 15
Employees' capacity to recognize the needs of their guests	4,1337	3,7847	**	20	7	+ 13
Reliability of services	4,4882	3,6573	**	5	15	- 10
The condition of facilities, equipment and surroundings	4,3161	3,3262	**	13	22	- 9
Medical and other professional programmes	4,3488	4,0694	**	10	1	+ 9
Price ranges and terms of payment	4,1369	3,7014	**	19	11	+ 8
Employees' professionalism	4,5600	3,7622	**	2	9	- 7
The location of the health spa	4,4556	3,6806	**	7	13	- 6
The adjustment of facilities, equipment and surroundings with the type of services provided	4,2948	3,4577	**	16	21	- 5
The heterogeneity of facilities, equipment and surroundings according to the type of services provided	4,1429	3,2958	**	18	23	- 5
Entertainment	3,3988	3,5175		23	19	+ 4
Other guests	3,5723	3,5248		22	18	+ 4
Employees' appearance	4,4765	3,8112	**	6	3	+ 3
Employees' overload	4,2326	3,5106	**	17	20	- 3
Employees' commitment to the comfort of their guests	4,6012	3,8056	**	1	4	- 3
Food and beverages	4,3041	3,6389	**	14	16	- 2
Health spa image	4,2948	3,5664	**	15	17	- 2
Management support in solving problems	4,3195	3,6783	**	12	14	- 2
Sleeping	4,5202	3,8028	**	4	5	- 1
The employees' knowledge of the assortment of health spa services	4,3276	3,6944	**	11	12	- 1
Availability, clearness and fairness of information	4,4195	3,7014	**	9	10	- 1
Physical safety of guests and security of their valuables	4,5322	3,8194	**	3	2	- 1
Promptness of service implementation	4,4444	3,7708	**	8	8	0

D   reveals the difference among ranks in research in 1991 and 1999.

**   t $_{(p)}$ < 0.01

The most important quality component from research 1991 is "employees' commitment to guests comfort". However, the top ranked in the 1999 research was "medical and other professional programmes".

One of the possible reasons for such change could be in the increasing share of guests who are paying for their stay by themselves and not by the state health security system. Looked upon the results from this perspective it could be concluded that high level quality medical and other professional programmes tailored to the needs of the guests could serve as strategic competitive advantage for health spas in Slovenia.

The least important quality components assessed by guests in 1991 were "entertainment" and "other guests", compared to "the heterogeneity of physical facilities, equipment and surroundings according to the type of services provided" and "the condition of physical facilities, equipment and surroundings" assessed by guests in 1999.

"Employees' commitment to guests comfort", "physical safety of guests and security of their valuables", "sleeping" and "employees' appearance" scored relatively high in 1991 and in 1999.

The reason for that could be found in the guests' demographic, psychographic and behavioural characteristics. The main part of guests in spas consisted of patients and reconvalescents.

The low scored components of the health spa service quality should be of interest to health spa management due to the fact that they could lose much of their energy in the efforts of being better at these particular components, sometimes even at the expense of more important service quality components.

It's interesting that the most important component from 1991 research ("employees' commitment to guests comfort") fell down to rank 4 by order of importance in 1999 research, whilst "medical and other professional programmes" exploded from the middle rank of importance in 1991 to the rank 1 in 1999.

The changes happened also among the least important components. "Entertainment" as the least important component in 1991 climbed up to rank 19 in 1999 whereas "the heterogeneity of physical facilities, equipment and surroundings according to the type of services provided" changed its position from rank 18 in 1991 to the most unimportant component in 1999.

"Recreation" and "employees' capacity to recognize the needs of their guests" made the biggest shift. They rose from ranks 21 and 20 in the year 1991 to ranks 6 and 7 in 1999. Just the opposite the components "reliability of services" and "the condition of facilities, equipment and surroundings" fell from ranks 5 and 13 in the year 1991 to ranks 15 and 22 in 1999.

But the central question to which authors concentrate is the homogeneity/heterogeneity of guests according to their evaluation of service quality components. According to the results of cluster analysis two groups of guests appeared in 1991 and in 1999 who differ according to the degree of their demand. The guests evaluating service quality components as very important were classified as very demanding guests. The guests who evaluated service quality components as less important were clasified as less demanding guests.
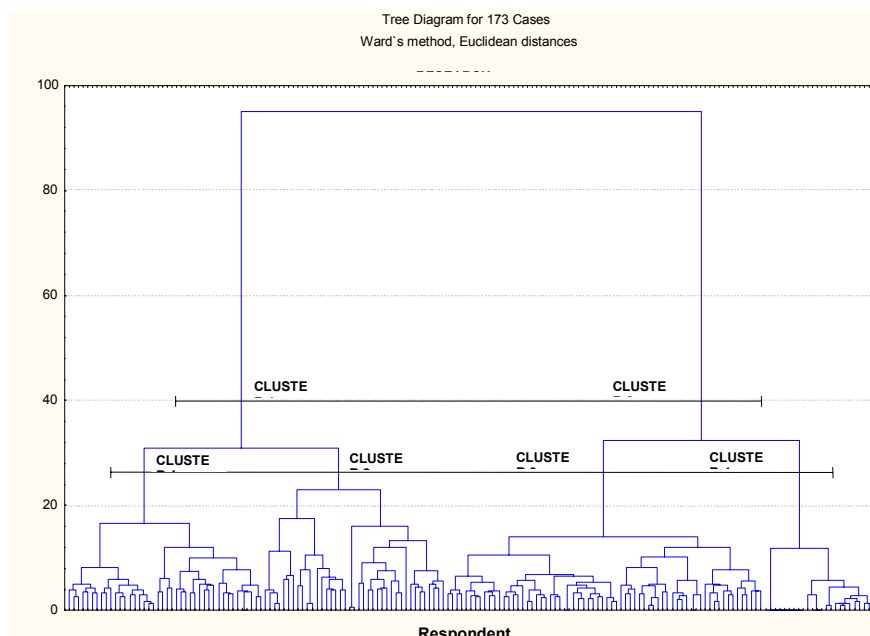

Figure 1. Dendrogram of the guests in 1991 research regarding their assessment of the importance of quality components

Guests in 1991 research can be divided to two or even into four clusters (groups). Considering two clusters the whole group of guests was split to: the segment of high degree of demand (cluster 1, Figures 1 and 2) and the segment of very high degree of demand (cluster 2, Figures 1 and 2). Considering four clusters authors call attention to the segment of extremely high demand guest

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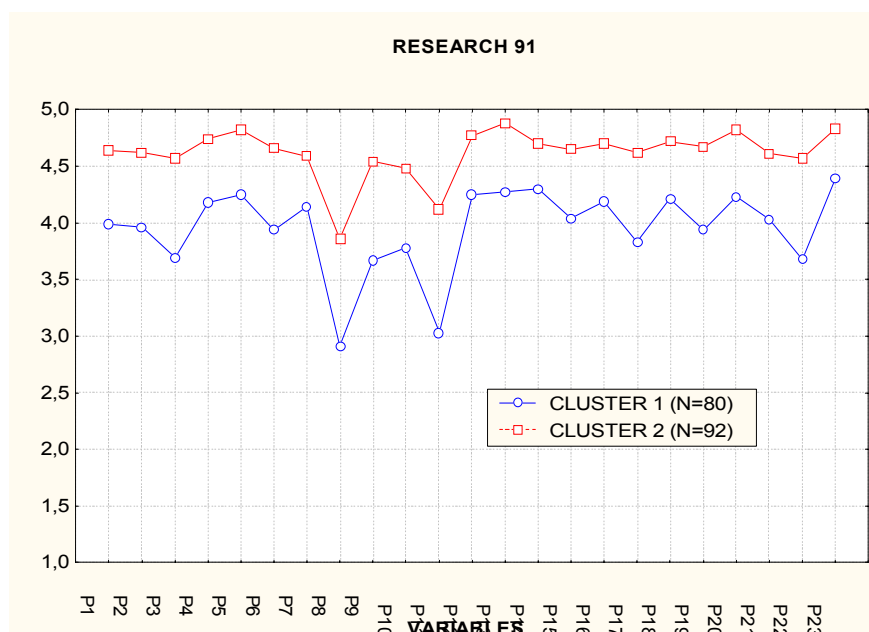(cluster 4, Figure 3). All four clusters differ significant on all components of quality (Appendix 1).

Figure 2. Profile of two groups of guests (clusters) in 1991 research regarding their assessment of the importance of quality components

Comparing the size of segments (number of segment members) in both research, the segment of very high demand guests in 1991 research was bigger that the segment of guests with high demand. In research 1999 the results were opposite. The segment of guests with high demand was smaller (N=64) compared with the segment of guests with average demand (N=80). In research 1999 the segment of guests with very high demand did not appear at all.
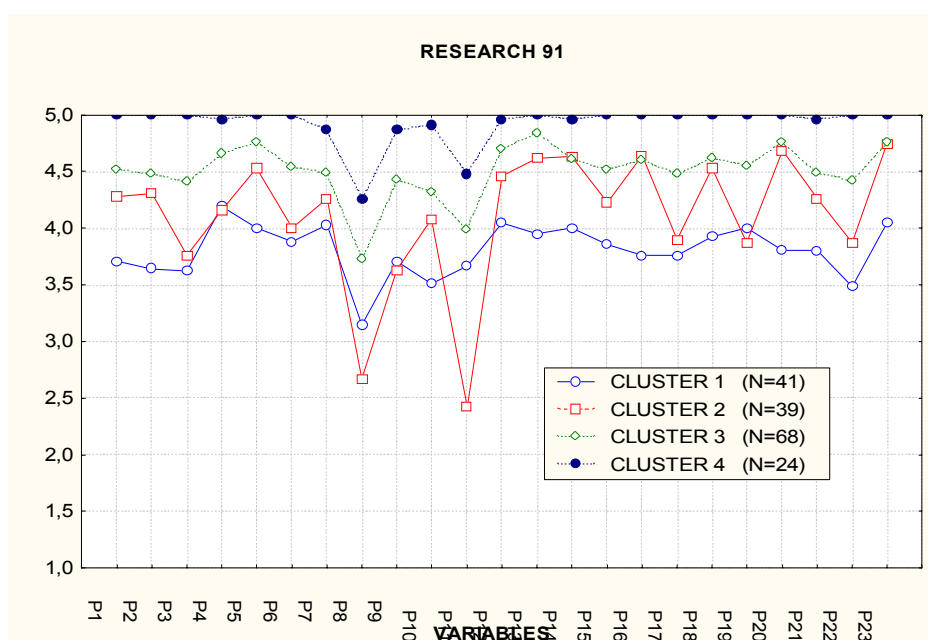
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Figure 3. Profile of four groups of guests (clusters) in 1991 research regarding their assessment of the importance of quality components

The conclusions from the results could be that in the years after the research 1991 two homogeneous segments of guests have appeared differing in the degree of their demand. The degree of the demand of guests in health spas has on general lowered. Does it indicate that the health spas with their services don't attract anymore high demanding guests?

Both clusters differ significantly on all components of quality (p<0,001, see Appendix 1). Between all four clusters there exist statistically important differences (p<0,001) on all quality components (see Appendix 1).

In 1999 research (Figure 4 and 5), there appear only two clusters (segments of guests) which are internally homogeneous. Both clusters differ significantly on all components of quality with exception of one – "recreation" (Appendix 2). One group consists of more demanding guests (cluster 1, Figures 4 and 5) and the other consists of middle demanding guests (cluster 2, Figures 4 and 5).
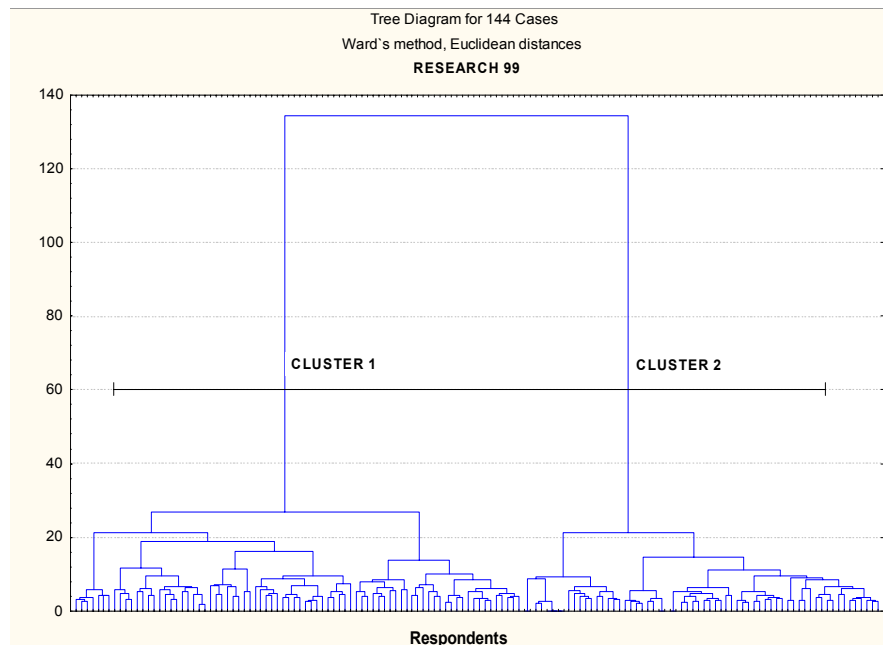
Tree Diagram for 144 Cases
Ward`s method, Euclidean distances
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Figure 4. Dendrogram of the guests in 1999 research regarding their assessment of the importance of quality components

In 1999 research authors didn't find the cluster of very high demanding guests, whilst this cluster was found in 1991 research. It is obvious that the degree of the demand of guests in health spas on general lowered between both research.

There are several possible explanations for such change. Authors speculate that some of them could be the following:

❑ the changes in the guests' demographic, psychographic and behavioural characteristics,
❑ the changes in health spas and their competitors' market approaches,
❑ the changes in their macro environment, and
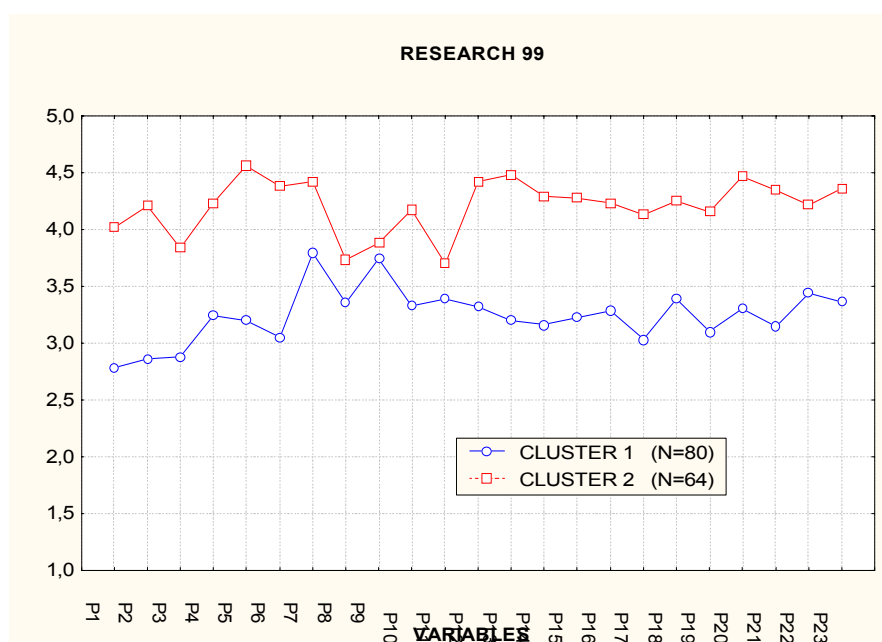❑ the real diminishment of the level of their service quality.

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Exhibit 5. Profile of two groups of guests (clusters) in 1999 research regarding their assessment of the importance of quality components

4. LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

However, in assessing the implications of this research its limitations must be acknowledged:

❑ too long period of time between the two projects;
❑ both research projects, the one from 1991 and the one from 1999 had dealt only with relatively small sample of guests in health spas;
❑ the research did not include all the guests;
❑ in gathering data, a quantitative method was used which can not produce by itself correct results without using the help of a qualitative method.

Therefore the generalization of the findings beyond the immediate population observed should be taken with caution and should not be comprehended as representing the entire health spa industry in Slovenia. In addition, the structure of health spa service quality components developed in the first study and for obvious reasons used in the second study, provides only a basic skeleton, which should be further adapted or supplemented to fit the

characteristics or specific research needs of a particular spa or particular range of services within one spa.

4.1. Suggestions for further research

The before mentioned limitations indicate the following suggestions for the future research in the area of the importance profiles of the overall service quality components in health spas:
❑ the intervals between particular research projects should be shorter,
❑ quantitative research methods should be combined with qualitative research methods and
❑ It would be very interesting to make guests segmentation in the basis of the importance of services quality components to them and the degree of their satisfaction with these components.

It is hoped that the findings of the study would encourage further development of the knowledge about the complex nature of the service quality phenomenon in general, and in health spas as well.

4.2. Managerial implications

It is evident from the results that the quality of health spas services is dynamic concept that should be continuously monitored with the special attention given to the causes of changes.

In both research project there are some service quality components that were given relatively low scores according to their importance. Preserving their level it is obvious that the spa management should pay more attention to the other more important components.

However the shifts of the importance of service quality components indicate the need for their continuous measurement. According to the results of 1999 project the guest in spas assessed as the most important quality dimension "empathy" followed by "reliability".

It is obvious from both projects that the least important service quality dimensions are "physical evidence" and "responsiveness". However it is recommended, that the management of health spas should provide especially for "empathy" and "reliability" and preserve the level of "physical evidence" and "responsiveness".

It is very important for health spas management to take into account that there exist segments of guests that are different among each other also on the basis of their degree of demand. Different managerial approach is obviously suitable for them.

REFERENCES:

1. Banka Slovenije, 1999
2. Carman, J. M. (1990), Customer perceptions of service quality: an assessment of the SERVQUAL dimensions, *Journal of Retailing,* 66 (1), pp. 33-35.
3. Durvasula, S., Lysonski, S., & Mehta, S.C. (1999), Testing the SERVQUAL scale in business -to-business sector: the case of ocean freight shipping service, *The Journal of Services Marketing,* 13 (2), pp. 132-150.
4. Fisk, R. P., Brown, S. W., & Bittner, M. J. (1993), Tracking the evolution of the services marketing literature, *Journal of Retailing,* 69 (1), pp. 61-103.
5. Kandampully, J. (1998), Service quality to service loyalty: A relationship which goes beyond customer services, *Total Quality Management,* 9 (6), pp. 431-443.
6. La Lopa, J. M., Marecki, R. F. (1999), The critical role of quality in the tourism system, *Quality Progress,* August, pp. 37-41.
7. Lewis, B.R., Mitchell, V. R. (1990), Defining and measuring the quality of customer service, *Marketing Intelligence and Planning,* (8), pp. 11-17.
8. Ogorelc, A., Snoj, B. (1998), Guests' satisfaction with tourism services: A case of health resorts in Slovenia, *The Tourist Review,* (2), pp- 38-45.
9. Parasuraman A., Zeithaml V. A., & Berry L. L. (1985). A conceptual model of service quality and its implications for future research. Journal of Marketing, 49 (Autumn), 41-50
10. Parasuraman A., Zeithaml V. A., & Berry L. L. (1986), *SERVQUAL A multiple item scale for measuring customer perceptions of service quality* (Report No. 56-108), Cambridge, MA: Marketing Science Institute.
11. Parasuraman A., Zeithaml V. A., & Berry L. L. (1988), SERVQUAL A multiple item scale for measuring customer perceptions of service quality. *Journal of Retailing,* 64, pp. 12-40.
12. Skupnost slovenskih naravnih zdravilišč, (2000), Celje.
13. Snoj, B. (1992), *Storitve v menjalnih procesih in model primerjalne analize njihove kakovosti na primeru zdravilišč Republike Slovenije,* Dissertation, Maribor: Faculty of economics and business, University of Maribor.
14. Snoj, B. (1995), The profiles of importance of service quality components in health spas, *Der Markt,* 34 (2), pp. 95-104.

15. Snoj, B., Mumel D., & Male, V. (1999), *Analiza pomembnosti sestavin zaznane kakovosti storitev v dveh slovenskih naravnih zdraviliščih,* Portorož: Marketing conference of Slovenian Marketing Association (DMS), pp- 159-164.
16. *Statistični letopis Republike Slovenije.* (2000), Ljubljana: SURS - Statistični urad Republike Slovenije, p. 39.

ANALIZA KLASTERA - INSTRUMENT SEGMENTACIJE GOSTIJU PREMA RAZINI NJIHOVIH ZAHTJEVA

Sažetak

Autori prikazuju uporabu analize klastera u određivanju homogenosti, odnosno heterogenosti gostiju u odnosu na razinu njihovih zahtjeva. Razina zahtjeva gostiju se određuje u skladu sa značajem percipirane kvalitete različitih čimbenika usluge, mjerenih metodologijom *SERVQUAL,* prilagođenom specifičnostima slovenskih toplica. Ciljevi članka su: (a) određivanje profila značaja čimbenika kvalitete usluge u nespecijaliziranim toplicama i (b) identifikacija grupa (segmenata) gostiju prema razini njihovih zahtjeva, ustanovljenih istraživanjem 1991. i uspoređenih s rezultatima istraživanja 1999. godine. Analiza klastera se koristi kao korisno oruđe za segmentaciju gostiju, pošto otkriva značaj važnih različitosti u strukturi gostiju 1991., u usporedbi s 1999. godinom. Rezultati istraživanja ujedno služe kao korisna baza podataka za upravljanje toplicama.

Appendix 1: Means of components and t values for two clusters and F values for four clusters in 1991 research.

	CLUSTER 1	CLUSTER 2	t-value	p	CLUSTER 1 - 4	
	Mean	Mean			F	p
P1	3,99	4,64	-6,229	,0000	23,47	,0000
P2	3,96	4,62	-5,252	,0000	18,16	,0000
P3	3,69	4,57	-7,394	,0000	23,20	,0000
P4	4,18	4,74	-4,837	,0000	8,76	,0000
P5	4,25	4,82	-5,732	,0000	17,44	,0000
P6	3,94	4,66	-5,677	,0000	13,03	,0000
P7	4,14	4,59	-3,563	,0005	6,16	,0005
P8	2,91	3,86	-5,775	,0000	14,49	,0000
P9	3,67	4,54	-6,238	,0000	14,68	,0000
P10	3,78	4,48	-4,863	,0000	13,77	,0000
P11	3,03	4,12	-6,516	,0000	29,39	,0000
P12	4,25	4,77	-6,028	,0000	18,29	,0000
P13	4,27	4,88	-6,878	,0000	29,50	,0000
P14	4,30	4,70	-4,544	,0000	21,06	,0000
P15	4,04	4,65	-6,165	,0000	19,77	,0000
P16	4,19	4,70	-5,099	,0000	29,38	,0000
P17	3,83	4,62	-6,875	,0000	19,71	,0000
P18	4,21	4,72	-5,102	,0000	18,93	,0000
P19	3,94	4,67	-6,191	,0000	15,35	,0000
P20	4,23	4,82	-6,431	,0000	38,63	,0000
P21	4,03	4,61	-5,341	,0000	16,32	,0000
P22	3,68	4,57	-6,573	,0000	19,23	,0000
P23	4,39	4,83	-4,903	,0000	22,20	,0000

Appendix 2: Means of components of service quality and t values for two clusters in 1999 research.

	CLUSTER 1	CLUSTER 2	t-value	p
	Mean	Mean		
P1	2,78	4,02	-8,073	**,0000**
P2	2,86	4,21	-9,947	**,0000**
P3	2,88	3,84	-6,227	**,0000**
P4	3,24	4,23	-7,084	**,0000**
P5	3,20	4,56	-11,303	**,0000**
P6	3,05	4,38	-10,743	**,0000**
P7	3,79	4,42	-3,938	**,0001**
P8	3,35	3,73	-3,062	**,0026**
P9	3,74	3,88	-,876	**,3827**
P10	3,33	4,17	-6,058	**,0000**
P11	3,39	3,70	-1,996	**,0479**
P12	3,32	4,42	-7,628	**,0000**
P13	3,20	4,48	-9,562	**,0000**
P14	3,16	4,29	-7,490	**,0000**
P15	3,22	4,28	-7,472	**,0000**
P16	3,28	4,23	-7,463	**,0000**
P17	3,03	4,13	-8,982	**,0000**
P18	3,39	4,25	-6,099	**,0000**
P19	3,10	4,16	-8,162	**,0000**
P20	3,30	4,47	-7,821	**,0000**
P21	3,15	4,35	-8,696	**,0000**
P22	3,44	4,22	-6,342	**,0000**
P23	3,36	4,36	-7,259	**,0000**