

TOURIST FARM SERVICE QUALITY ASSESSMENT

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Abstract

Farm tourism shows a structure different from agriculture, forestry, and fishery; farm tourism is expanding, labour intensive, generates an influx of money, and maintains the service base in the region. Farm tourism is one of the most important supplementary activities and generates considerable secondary income. This paper presents the developed methodology that will enable the ranking of tourist farms based on their service quality. This is accomplished through the use of the expert system based on the DEXi decision-making method. Using DEXi, the multi-criteria decision model for the assessment of farm tourism's service quality was developed. The model was applied in practice on 7 vacation farms. The data from the questionnaires completed by farm guests and hosts was used as input data in the multi-attribute model and as an arbitrary estimation for the farm. The results of the model are shown as the assessments for individual farms. Out of seven chosen farms, four achieved the best possible estimation. Two of them achieved middle estimation. For the last tourist farm, where a data deficit was present, the model showed two final possible estimations (very good or good and bad - depends on value of missing attributes).

Key words

tourist farm, multi-criteria analysis, DEXi methodology, ranking

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1. Introduction

Farm tourism is probably the oldest form of rural tourism (Nilsson 2002), arguably dating back over a century (Dernoi 1983). In many rural regions, tourism is accepted as a natural part of the socio-economic fabric juxtaposed with agriculture (Fleischer and Tchetchik 2005). While demand-side motivations for farm tourism remain enigmatic, incentives for the operators are perhaps more obvious. Perceived economic benefits are normally a key factor. Extra income was the most frequent motivation for farm tourism businesses. Diversification into tourism does sometimes keep the household economy viable (Sharpley and Vass 2006), with tourism earnings even exceeding those from agriculture (Worth 1997). On the basis of the aforementioned facts, for the successful performance of vacation farms, ongoing information about market behaviour, specialized offer, education processes and searching for comparative advantages and emerging opportunities are crucial (Pa ek et al. 2005).

The service quality of rural tourism suppliers is a decisive factor considered by customers/consumers when choosing a farm to visit/stay on (Poto nik 2006). Therefore, there is a clear need for evaluation of service quality. The literature suggests different methods for measuring tourism industry service quality (Fleischer et al 1993; Reiche et al 2000; Calantone and Benedetto 1991). Kahn (2003) developed an aim to investigate the service quality expectations of the ecotourists by developing an adapted version of the SERVQUAL scale. In contrast, Štambuk (2002) and Poto nik (2006) proposed a methodology based on multi-criteria analysis. For instance, the expert system DEX (and its Windows successor DEXi) for qualitative, multi criteria decision-making (Bohanec et al 2000; Bohanec et al 1995) has already been successfully used for estimation of tourist service quality in case of hotels (Štambuk 2002) and vacation farms (Poto nik,2006).

DEX (and its windows version DEXi) is an expert system methodology shell for qualitative multi-criteria decision-making and support. Many life applications of multi-criteria methods were based on DEX (Bohanec and Rajkovi 1990). DEX combines "traditional" multi-criteria decision-making with some elements of Expert Systems and Machine Learning. The main characteristic of the DEX method is its capability to deal with qualitative variables. The objectives are hierarchically ordered into a tree structure. The DEX expert system can be used to find solutions to various decision problems (Leskovar 1993; Bohanec et al. 1995; Bohanec et al. 2000; Bohanec and Rajkovi 1999). The basic approach in DEXi methodology is a multi-criteria decomposition of the problem: the decision problem is decomposed into smaller and less complex decision problems (sub-problems). In this way, we get a decision model consisting of attributes that represent individual sub-problems. The attributes are organized hierarchically and connected with utility functions. The utility functions evaluate each individual attribute with respect to their immediate descendants' objective in the hierarchy. Instead of numerical variables, which typically constitute traditional quantitative models, DEXi uses qualitative variables; their values are usually represented by words rather than numbers, for example "low", "appropriate", "unacceptable", etc. Furthermore, to represent and evaluate utility functions, DEXi uses "if-then" decision rules. The utility function, in fact, represents a knowledge base (the complete set of "what if" decision rules), which is ultimately used for evaluation of alternatives (Bohanec and Rajkovic 1999; Bohanec et al 1995; Bohanec et al 2000; Bohanec and Zupan 2004).

2. Materials and methods

This study is based upon multi-attribute decision analysis and the expert system DEXi. Hierarchical multi criteria decision models (MCDM) are a general decision support methodology aimed at the classification or evaluation of options that occur in decision-making processes (Rozman and Pa ek 2005). However, in order to incorporate different conflicting criteria in the decision-making process, MCDA methodology was considered for decision support on tourist's farms. In comparison to standard evaluation approaches such as farm budgeting or linear optimisation techniques, the MCDA is able to build the hierarchy of the problem and prioritize individual decision-making criteria, as seen in Fig. 1.

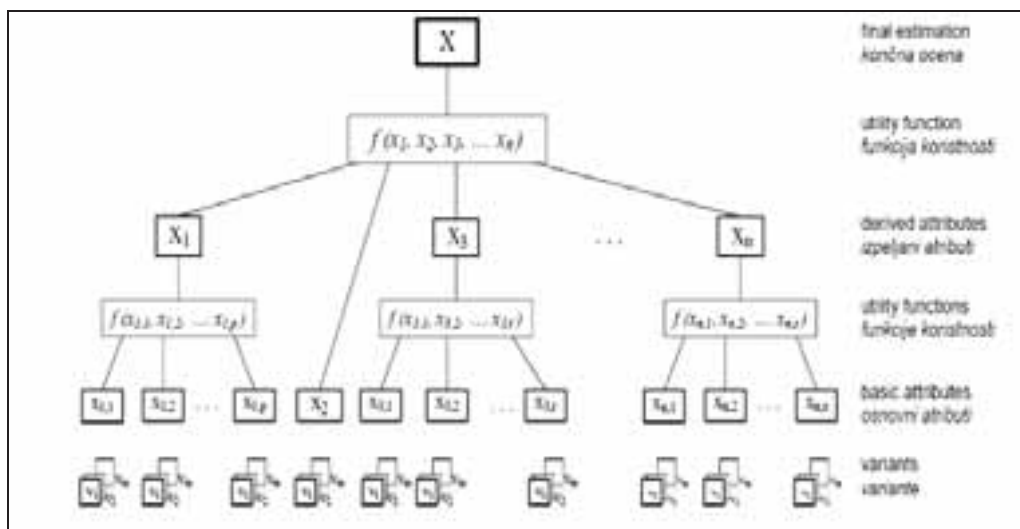


Fig. 1: Multi-criteria decision-making tree.

Source: Lipuš ek 2005.

According to the preliminary defined hierarchy, two sets of questions were constructed in order to derive priorities and values for individual criteria. The first questionnaire was issued to tourist farm operators and its staff and the second to customers – guests. The guest questionnaires were set according to Taylor (1992) recommendations for the main parameters (attributes) influencing the guest's decision regarding whether to take a vacation on a specific site. A total of 7 vacation farms were included in the research and guest questionnaires were issued to a total of 103 guests of various national backgrounds. The questionnaire results were, to some extent, used as input data for the DEXi multi criteria model as well as for modification of initial hierarchy. In the first stage of DEXi decision model development, the possible alternatives are identified. The problem is divided into individual less complex problems and a set of qualitative values (scales) is assigned to every attribute (criteria) (Tab. 1).

After each attribute has been assigned to its scales (qualitative value), the utility functions (knowledge base) are defined. The next step in forming the multi-criteria decision-making model is defining the utility functions, i.e., the decision-making ("if-then") rules. The rules need to be developed for all the criteria that have dispersed structures underneath them in the decision-making tree; this means all, except the

criteria on the lower branches of the decision-making tree. We can present the criteria in the form of a table for each group. What we need to be careful about when developing the decision-making rules is the consistency between the defined rules for certain combinations of the criteria values. The utility functions evaluate each individual attribute with respect to their immediate descendants in the hierarchy. The decision rule can be, for instance: "if the premises are unsuitable and the services are poor, then the guest decision rule is poor". The decision rules are presented in complex form where an asterisk "*" means any value and \geq means acceptable or good (Tab. 2). This procedure is conducted for each level in the hierarchy (partial utility function for aggregate attributes and overall utility function for the whole model except for the lowest level in the hierarchy).

Tab. 1: Decision hierarchy and scales.

Attribute	Scales
Tourist farm supply quality	poor; average; good; very good
Guest	poor; average; good; very good
Premises	unsuitable; suitable; very suitable
Landscape	unsuitable; suitable; very suitable
Environment	unsuitable; suitable; very suitable
Architecture	unsuitable; suitable; very suitable
Order and cleanness	satisfactory; good; excellent
Access to the farm	poor; acceptable; good
Parking	no parking place; acceptable; good
House	poor; acceptable; good
Equipment	unsuitable; suitable; very suitable
Homeliness	no; yes
Cleanness	satisfactory; good; excellent
Spaciousness	unsuitable; suitable; very suitable
Services	poor; acceptable; good
Food	poor; acceptable; good
Taste	not good; good; excellent
Look	not good; good; excellent
Variegation	monotonous; variegated; very variegated
Serving	poor; acceptable; good
Drinks	poor; acceptable; good
Variegation	monotonous; variegated; very variegated
Serving	poor; acceptable; good
Tradition	typical; extra
Attitude	unfriendly; friendly
Personal to customer	unfriendly; friendly
Personal - personal (family members)	unfriendly; friendly
Personal cleanliness	not suitable; suitable
Additional services	poor; acceptable; good
Sport	not available; available
Animation regullary	not conducted; conducted sometimes; conductor
Souvenirs	not available; few; available
New visit	no; yes
Farm operator	poor; average; good; very good
Plans for the future	will not continue with farm tourism; will continue with farm tourism
Satisfaction	poor; acceptable; good
Work comparison	harder; more demanding; easier; more pleasant
Income	poor; acceptable; good
Labor distribution	unsuitable; suitable; very suitable
Is working in farm tourism interesting?	not; interesting; very interesting

Finally, attributed values for each alternative are put into the DEXi evaluation table (the values are obtained from questionnaires) and the multi-criteria analysis is provided.

Tab. 2: Decision rules for tourist farm supply quality problem – highest level.

Premises	Services	Additional services	New visit	Guest
30%	29%	18%	24%	
1 unsuitable	poor	*	*	poor
2 unsuitable	<=acceptable	poor	*	poor
3 unsuitable	<=acceptable	*	no	poor
4 unsuitable	*	poor	no	poor
5 <=suitable	poor	poor	*	poor
6 <=suitable	poor	*	no	poor
7 *	poor	poor	no	poor
8 unsuitable	acceptable	>=acceptable	yes	average
9 <=suitable	acceptable	acceptable	yes	average
10 unsuitable	good	poor	yes	average
11 unsuitable	good	>=acceptable	no	average
12 suitable	poor	>=acceptable	yes	average
13 suitable	<=acceptable	acceptable	yes	average
14 suitable	acceptable	<=acceptable	*	average
15 >=suitable	>=acceptable	poor	no	average
16 very suitable	poor	poor	yes	average
17 very suitable	poor	>=acceptable	no	average
18 unsuitable	good	>=acceptable	yes	good
19 <=suitable	good	acceptable	yes	good
20 suitable	acceptable	good	*	good
21 suitable	good	<=acceptable	yes	good
22 suitable	good	acceptable	*	good
23 >=suitable	good	acceptable	no	good
24 very suitable	poor	>=acceptable	yes	good
25 very suitable	acceptable	poor	yes	good
26 very suitable	>=acceptable	acceptable	no	good
27 >=suitable	good	good	*	very good
28 very suitable	>=acceptable	>=acceptable	yes	very good
29 very suitable	>=acceptable	good	*	very good
30 very suitable	good	*	yes	very good

3. Result and Discussion

Evaluating the variants is a procedure of determining the final estimation of the variants on the basis of their description according to the basic criteria. The evaluation is undergone from "the bottom up", in accordance with the structure of the criteria and utility functions. The variant with the best evaluation value is usually the best, as long as no major errors occurred during the evaluation. The final estimation is influenced by many factors and an error may occur at each of these factors. Besides, the final estimation usually does not suffice for the full picture of an individual variant; therefore, variants need analysis.

The aim of this paper is to address 7 vacation farm service quality assessment problems with the application of the expert system DEXi. On the base of the defined utility functions, the selected vacation farms, with respect to the defined decision hierarchy for service quality evaluation, were evaluated. Ranking of farms from the best to the worst is also enabled. The results show the evaluation for 7 analyzed farms.

Tab. 3 shows assessment for aggregate and basic attributes (input values). The asterisk (*) means that we had no data for the particular basic attribute. The highest assessment ("very good") was obtained for the farms B, C, F, and G. This is followed by the farms A, which have been assessed as "good". According to the

defined decision rules, two results are possible for farm D ("average", "good") and for farm E ("good" or "very good") and the final result for those two farms would depend on the unknown values of basic attributes. Since professional service quality farms have been selected for the model application the model does not separate between the farms. The final DEXi assessment of their supply quality is presented in Tab. 3.

Tab. 3: Results of DEXi evaluation with values of basic and aggregate attributes (Part 1).

Attribute	A	B	C	D
Tourist farm supply quality	good	very good	very good	
Guest	good	very good	very good	average; good
Premises	very suitable	very suitable	very suitable	very suitable
Landscape	very suitable	very suitable	very suitable	very suitable
Environment	very suitable	very suitable	very suitable	very suitable
Architecture	very suitable	very suitable	very suitable	very suitable
Order and cleanness	good	excellent	excellent	excellent
Access to the farm	good	good	good	good
Parking	good	good	good	good
House	acceptable	good	good	good
Equipment	suitable	very suitable	very suitable	suitable
Homeliness	yes	yes	yes	yes
Cleanness	good	excellent	excellent	excellent
Spaciousness	very suitable	very suitable	very suitable	very suitable
Services	acceptable	good	good	poor; acceptable
Food	acceptable	good	good	acceptable
Taste	excellent	excellent	excellent	good
Look	excellent	excellent	excellent	good
Variagation	variegated	very variegated	very variegated	variegated
Serving	acceptable	good	good	acceptable
Drinks	*	*	*	*
Variagation	variegated	variegated	variegated	variegated
Serving	acceptable	good	good	good
Tradition	*	*	*	*
Attitude	friendly	friendly	friendly	*
Personal to customer	friendly	friendly	friendly	*
Personal - personal (family members)	friendly	friendly	friendly	*
Personal cleanliness	suitable	suitable	suitable	*
Additional services	poor	poor	poor	poor
Sport	not available	not available	not available	not available
Animation regulary	not conducted	not conducted	not conducted	not conducted
Souvenirs	few	not available	not available;	not available
New visit	yes	yes	yes	yes
Farm operator	very good	very good	very good	very good
Plans for the future	will continue with farm tourism	will continue with farm tourism	will continue with farm tourism	will continue with farm tourism
Satisfaction	good	good	good	good
Work comparison	more pleasant	more pleasant	more demanding	more pleasant
Income	acceptable	good	good	good
Labor distribution	very suitable	suitable	very suitable	very suitable
Is working in farm tourism interesting?	very interesting	very interesting	very interesting	very interesting

The precise analysis of attributes can be used in order to identify possible weaknesses (attribute analysis) of the analyzed farms. Another potential problem of DEXi is that it currently supports only qualitative attributes and utility functions, but

provides no facilities for dealing with quantitative ones. As this seems highly desirable for many practical problems, further study should be particularly focused on an integration of qualitative and quantitative modelling techniques in the assessment of service quality.

Tab. 3: Results of DEXi evaluation with values of basic and aggregate attributes (Part 2).

Attribute	E	F	G
Tourist farm supply quality	good; very good	very good	very good
Guest	very good	very good	very good
Premises	very suitable	very suitable	very suitable
Landscape	very suitable	very suitable	suitable
Environment	very suitable	very suitable	suitable
Arhitecture	very suitable	very suitable	suitable
Order and cleanness	excellent	excellent	good
Access to the farm	good	good	acceptable;
Parking	good	good	acceptable;
House	good	good	good
Equipment	very suitable	suitable	suitable
Homeliness	yes	yes	yes
Cleanness	excellent	excellent	excellent
Spaciousness	very suitable	very suitable	suitable
Services	good	good	good
Food	good	good	good
Taste	excellent	excellent	excellent
Look	excellent	excellent	excellent
Variagation	very variegated	very variegated	very variegated
Serving	good	good	good
Drinks	*	*	*
Variagation	variegated	variegated	variegated
Serving	good	good	good
Tradition	*	*	*
Attitude	friendly	friendly	friendly
Personal to customer	friendly	friendly	friendly
Personal - personal (family members)	friendly	friendly	friendly
Personal cleanliness	suitable	suitable	suitable
Additional services	good	acceptable	good
Sport	available	available	available
Animation regullary	conducted sometimes	not conducted;	conducted sometimes
Souvenirs	few	few	few
New visit	yes	yes	yes
Farm operator	*	very good	very good
Plans for the future	*	will continue	with farm tourism
Satisfaction	*	good	good
Work comparison	*	more demanding	more demanding;
Income	*	good	good
Labor distribution	*	very suitable	very suitable
Is working in farm tourism interesting?	*	very interesting	very interesting

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Summary

The carriers of the farm's activities are often forced to choose an additional activity because of unfavorable structure of the farm and, consequently, an unsatisfying financial situation. According to aforementioned facts, the data also shows that farm tourism is the supplementary activity with the most important role.

In the research, a multi-criteria model for evaluation and ranking of vacation farms using DEXi, the expert system for multi-attribute decision-making, was developed. The DEXi multi-attribute decision models are based on the division of the problem into smaller sub-problems, which have to be assessed separately. Single sub-problems (attribute, criterion, parameters) are located on different levels of the "hierarchical tree". Merging the assessments of single sub-problems, we achieve the final – aggregated estimation of the utility (worthiness). Using the utility functions that are defined in the form of "if-then" decision rules, the influence of a single criterion on the final estimation of the utility is enabled. DEXi uses qualitative attribute values, which are of great importance in cases dealing with less structured decision problems and where the participation of expert knowledge is needed. The expert system also enables analyses of forming single estimation and selective analyses. The data is transparent and easily checkable, but does not reduce the meaning of an expert's contribution. It enables the systematic use of data and automation of the process.

The model was applied to 7 vacation farms with accommodation from different parts of Slovenia. On all of them, the guests and the carriers of the supplementary activity were interviewed. The results of the questionnaires, relating to general meanings of single attributes of the supplied tourism's quality, were used for correction of a preliminary planned model. In the second round of the interviews, the concrete estimations of single supply's attributes for chosen vacation farms were obtained. This data was used as input data for the DEXi model in the phase of evaluation of the utilities. The results gained in the model were compared with the arbitrary assessment based on the guest interviews.

The DEXi multi – attribute decision model enables ranking of farms by their quality. From seven chosen farms, four achieved the best possible estimation. Two of them received middle estimation. For the last farm, which had deficient data, the model has shown two possibilities: in the case of excellent or good estimation of carrier's results, the farm would achieve very good result; in the case of bad criterion of carrier's satisfaction, the final utility of the farm would be bad.

The ranking of vacation farms based on the DEXi model and the arbitrary ranking is similar. However, there were a few differences, which are easy to explain. The fact is that the final assessments of investigators are subjective, while the model-based assessments reflect estimations of single supply's attributes.

One of the methods successfully being used in practice for solving such decision-making problems is the method of multi-criteria decision-making. The presented multi-criteria models enable precise estimation and ranking of vacation farm service quality. It is a useful facility for objective assessment of farm tourism's supply. The presented multi-criteria models enable precise estimation and ranking of vacation farm service quality. Despite the minor deficiencies (such as use of qualitative data

only), we have found that the approach has fulfilled most of our expectations and revealed considerable advantages in comparison with other approaches. The multi attribute DEXi model can, therefore, be regarded as a useful alternative tool for service quality measurement and can also be used by government institutions responsible for vacation farm certification as well as for assessment of applications for various rural development supports. Further research is needed in the field of integrating quantitative data into DEXi modelling framework as well as comparison to other multi criteria methods (such as AHP; Saaty 1980) and other service quality measurement tools.