

## **The Application of AHP in the construction of real estate intermediary service quality evaluation system**

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**Abstract.** The purpose of this paper is to establish a real estate intermediary service quality of scientific and feasible evaluation system and to guide the intermediary achieve a better service effect. this paper establish a model of real estate intermediary service quality evaluation system based on the AHP method. Through the multi-level target layer to establish judgment matrix and compared, find out the weight of each index, and then carried on the single order and a total order on the various indicators, do the consistency check to ensure that the matrix can be accepted, then construct the evaluation system model of real estate intermediary service quality.

### **Introduction**

The last century since the 90's, along with the recovery of the real estate industry in China, real estate intermediary service, as an important part of the real estate market, also obtained the rapid development from scratch. However, how to evaluate the real estate intermediary service quality, establish a complete and scientific evaluation system has not been more specific and in-depth study<sup>[1-3]</sup>.

This paper mainly has two aspects of innovation: on the one hand, to establish a set of evaluation system, real estate intermediary services lack of quality evaluation system model; on the other hand, the analytic hierarchy process is applied to the evaluation system model, a combination of quantitative and qualitative analysis makes the evaluation system more scientific and more feasible model<sup>[5]</sup>.

### **The content of the real estate intermediary service**

Real estate intermediary services including real estate advisory, real estate appraisal, real estate economic activities and other activities.

Three service contents of real estate intermediary, should exist such a relationship: real estate consulting, real estate evaluation can provide alone; to provide real estate brokerage services should also provide the first two service content. Commissioned while the contract, signed with the real estate intermediary buyer or seller, is not only an intermediary contract, but should be determined by the which property intermediary contract bears obligations, attached to provide real estate consulting, valuation service and receive the corresponding compensation rights

### **The model of the AHP**

The position and thinking and principles of the valuator are different, it will lead to selection of evaluation factors and solution approach is different, in the specific operation depends on individual. How to avoid the adverse consequences, and avoid risk, reduce the possible loss. Mainly discussed from the basic principles of establishing the system<sup>[4]</sup>.

**Basic principles of the construction of real estate intermediary service quality evaluation.**

First, the real estate intermediary service quality evaluation system should have wide adaptability<sup>[6]</sup>. Diversity of the intermediate types, determines the diversity of real estate

intermediary service quality. Therefore, the real estate intermediary service quality evaluation system must be applicable and flexible.

Secondly, accord with actual, the actual construction of real estate intermediary service quality evaluation system must be consistent with the real estate intermediary. Some basic project, national laws and regulations, expressly projects in the evaluation system as a mandatory requirement; and some selective projects, countries without mandatory requirements of the content, the formulation of the different classes of service, different aspects of service standards.

Finally, the evaluation system should meet the requirements of intuitive and easy to use.

**Established the hierarchical structure model.** The most basic form of hierarchical structure is composed of a node link several nodes of the tree, a layer of nodes is a variable, determined by the next layer of the several variables<sup>[7]</sup>. The general form of hierarchical structure is composed of these basic forms of combination, after the real estate intermediary service quality in the know nouns of each node, each node is determined under a layer of a layer of nodes connected to the weight coefficient, and show that in the corresponding diagonal edge, then get a hierarchical structure model.

**construction of two two comparison judgment matrix.** The importance of each factor to the single criterion between below a level two two comparison, obtained two two comparison matrix. For example, the C layer factor of  $C_1, C_2, \dots, C_n$  and L layer of the  $D_m$  related factors, judging matrix are determined as shown in the following table, namely the judgment matrix  $B = b_{ij} \ (i, j) \ m \times n$ .

Table 3-1 judgment matrix B

$D_m$	$C_1$	$C_2$	...	$C_n$
$C_1$	$b_{11}$	$b_{12}$	...	$b_{1n}$
$C_2$	$b_{21}$	$b_{22}$	...	$b_{2n}$
...	...	...	...	...
$C_n$	$b_{n1}$	$b_{n2}$	...	$b_{nn}$

Which means that for  $D$ , the relative degree of importance of the  $C$  layer of each element is compared.

Analytic Hierarchy Process uses a 1-9 scale factor method for pairwise comparison quantitative description of the general 1-9 scale method<sup>[8]</sup>.

**The level ordering and consistency inspection.**

1 the level of total order

In general, for the top second levels under the single ranking is the total ordering. If all elements in a layer of  $A_1, A_2, \dots, A_k$  order in single level has been completed, the weights obtained for  $A_1, A_2, \dots, A_k$ , and  $A_i \ (1 \leq i \leq k)$  The level of the corresponding element of the  $B_1, B_2, \dots, B_m$ ; single ranking results for

$$B^i = (b_{11}^i, b_{12}^i, \dots, b_{1n}^i) \quad b_j^i = 0$$

2 consistency test

C.I. -- consistency index of the total order

R.I. -- the level of total order random consistency index

C.R. -- the level of total order random consistency ratio

Among them

$$C.I. = \sum_{i=1}^k a_i C.I._j \quad C.R. = \sum_{i=1}^k a_i R.I._i \quad C.R. = \frac{C.I.}{R.I.}$$

When C.R. is less than or equal to 0.10, the consistency is that the level of total order of the calculated results can be accepted.

### Case description1.Introduction

**The hierarchical structure model diagram.** Tianjin Nankai District real estate conduit company, mainly engaged in the sale of second-hand housing and rental services, the scope of services related to housing assessment, consulting and real estate economic activities. In the real economic activities in service quality involves four main aspects of service environment, service operation, service skill and service attitude. So for the target layer, the quality of service can use these four aspects to carry on the evaluation, namely, the hierarchical structure model of second layers. A further downward refinement variables, we obtain the following model:

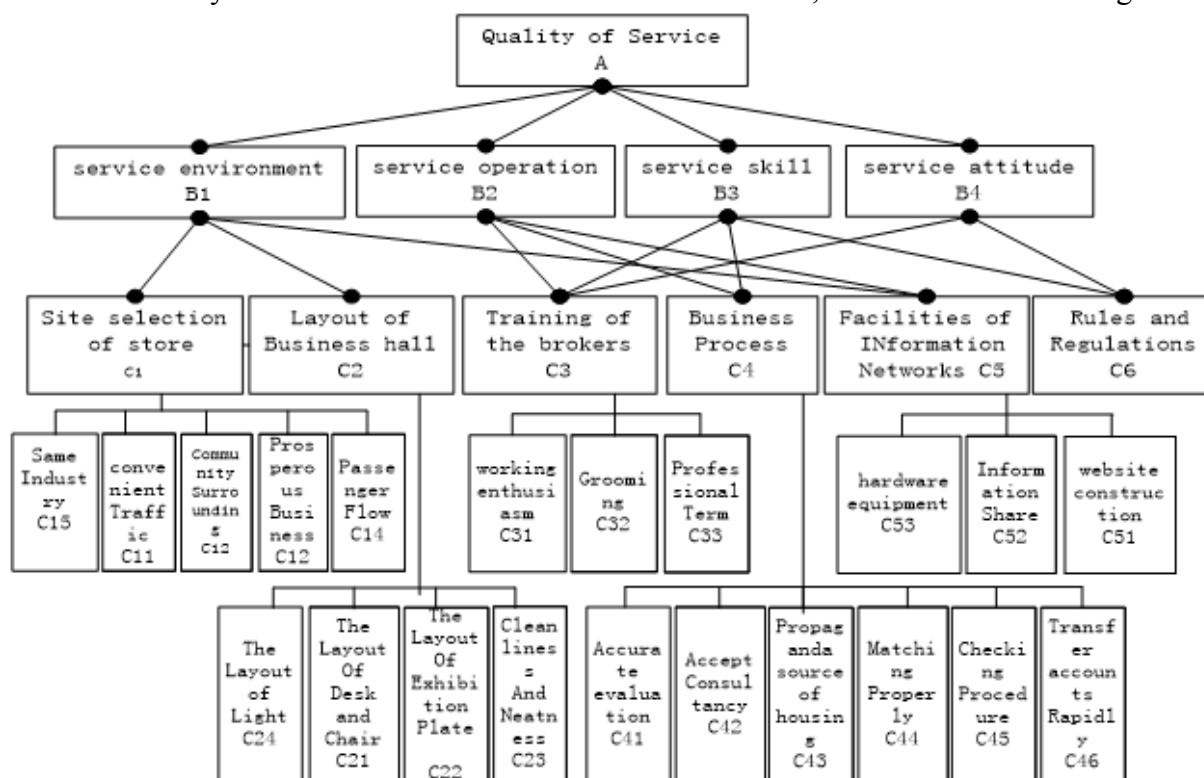


Figure 4-1 hierarchical structure model diagram

**The total sequencing and analysis.** For the level of total order according to the above judgment matrix, as shown in the following table:

Table 4-2 the level of total order table

LevelC	LevelB				The C layer total sorting weight $W_i$
	$B_1$ 0.30	$B_2$ 0.10	$B_3$ 0.30	$B_4$ 0.30	
C1	0.105				W1=0.0315
C2	0.637				W2=0.1911
C3		0.625	0.258	0.25	W3=0.2149
C4		0.239	0.637		W4=0.215
C5	0.258	0.136			W5=0.091
C6			0.105	0.75	W6=0.2565

According to the analysis of the total sequencing results:

The weight sequence of third layer target for C6, C4, C3, C2, C5, C1.

The weight sequence of fourth layer target for C12, C22, C12, C42, C32, C24, C51, C13, C41, C44, C43, C45, C14, C52, C21, C31, C23, C15, C11, C53, C46.

For the third layer, the first four indexes, evaluation for the decision goal that is C6, C4, C3 and C2 can reach 0.8775, so the evaluation of real estate intermediary service quality should be mainly from the four aspects; the real estate conduit company to improve their service quality but also from the four aspects of.

For the fourth layer, the first eight indicators, evaluation for the decision goal namely C12, C22, C12, C42, C32, C24, C51, C13 can reach 0.465, in order to increase the accuracy of evaluation to re select the first 12, namely C12, C22, C12, C42, C32, C24, C51, C13, C41, C44, C43, C45, for the evaluation and target layer can reach 0.610448, so the evaluation of real estate intermediary service quality and real estate intermediary to improve their own quality of service should be specific to this problem from 12 aspects.

In this case, the use of AHP to determine the weight of various scientific evaluation index, find out the key factors in the evaluation of real estate intermediary service quality, and these are also key factors is the bottleneck of case company service quality improvement and improve service quality after the starting point. The final evaluation result is reasonable, is satisfactory.

## Conclusion

The success of the evaluation system model of real estate intermediary established service quality through the application of analytic hierarchy process. By defining the problem, establish the hierarchical structure, constructing judgment matrix, order in single level, the level of total order, consistency test six steps for the whole system level analysis, the problem of hierarchical, to describe the top from every side, so that the total target is more complex, difficult to grasp from each side can be simplified, so that be easy to understand.

Through the example analysis of each objective factors of the evaluation system, and establishes the matrix through the consistency test to prove that the matrix is acceptable. But some factors can influence the scientific and effective evaluation system model, in the actual application must be constantly improved, further improving the evaluation system model, provide better service for customers and Real Estate Company.

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