Original Research Article

Research on performance evaluation of rural revitalization project based on value engineering theory

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Abstract: At present, domestic research on rural revitalization mostly focuses on countermeasures and evaluation indicators, and there is little concern about rural performance evaluation. Based on the value engineering theory, this paper constructs the performance evaluation index system model of rural revitalization project, and applies Shapley method, triangular fuzzy number method and fuzzy comprehensive evaluation method to perform indicator weighting and quantitative aggregation of data of the functional elements and cost, and uses the value coefficient as the evaluation criteria of the performance level of rural revitalization project, in order to judge the level of performance of rural revitalization project, analyze the resource utilization efficiency in the implementation process of rural revitalization project, and then point out the direction for the performance optimization measures of rural revitalization project.

Keywords: Value Engineering; Rural Revitalization; Performance Evaluation; Fuzzy Number Method.

1. Introduction

On September 26, 2018, the strategic plan for rural revitalization (2018–2022) issued by the CPC Central Committee and the State Council made strategic deployment in key areas of rural infrastructure, people's livelihood and diversified capital investment. As for further promoting the implementation of the rural revitalization strategy, we should not only accelerate the implementation of the rural revitalization policy, but also urgently carry out quantitative evaluation on the construction performance of the rural revitalization project, and build a scientific and complete performance evaluation system model, so as to accurately judge the performance of the rural revitalization project in real time and provide more appropriate solutions. Value Engineering (VE), proposed by American engineer miles, can be summarized as a management ideological and theoretical system to realize the close combination of technology and economy[1]. In the 1970s, China began to introduce and develop the concepts related to value engineering, and through the combination with China's social conditions and economic status, it has made rapid development in many aspects from China's manufacturing industry to social production and management. However, the theory of value engineering is rarely used in the performance evaluation of the implementation of relevant national strategic projects in China.

Currently, the relevant theoretical research on rural revitalization has gradually formed a system in China. Wu Zhongquan believes that the implementation of the rural revitalization project requires the development of rural human capital through multiple channels: the flow of rural human capital can be driven by industrial development, the new driving force of rural human capital can also be created by education, the market adaptability of rural human capital can be enhanced through training, and the durability of rural human capital can be improved through health care measures, and the vitality of rural human capital can be stimulated by labor migration[2]. Bao Rong, Zhao Pinji, Liu Yuwen and others studied the countermeasures to promote rural revitalization from the perspectives of protecting and excavating rural culture, industrial integration, grass-roots party construction and soft power cultivation[3–5]. Zheng Jiaqi, Wei Jiahua and others put forward the evaluation index system of rural revitalization project Based on the general requirements of rural revitalization put forward

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in the report of the 19th national congress, namely "industrial prosperity, ecological livability, rural civilization, effective governance and rich life"[6,7]. Through the above analysis, it can be seen that the domestic research on rural revitalization project mostly focuses on the countermeasures and evaluation indicators, and there is little exploration on the performance evaluation of rural revitalization project. Through the sorting of existing literature and the collection of expert opinions, this paper determines the contents of functional element indicators and cost element indicators, applies the principle of value engineering theory to the construction of performance evaluation index system and model of rural revitalization project, and through the weighting of functional element indicators and cost element indicators, then realizes the quantitative aggregation of the function coefficient and cost coefficient, determines the value of the value coefficient V, and judge the obtained V value according to the performance evaluation standard of the rural revitalization project, in order to realize the scientific management of the promotion process of the rural revitalization project, improve the practical value of the project and reduce the investment cost of realizing the project objectives.

2. Function and Cost Analysis of Performance Evaluation Index System of Rural Revitalization Project

With the change of social behavior subjects, rural areas have changed from single geographical space to composite material flow and spatial flow. Comprehensive spatial attributes such as culture, society and agricultural production have replaced the leading agricultural production function[8]. The realization of the composite value of rural economy, society and environment has become the key basis for the performance evaluation of rural revitalization project. The performance level of rural revitalization project can be presented by the value coefficient in value engineering, and the value coefficient is the ratio of functional indicators and cost indicators after quantification. Therefore, the top priority of constructing the performance evaluation index system of rural revitalization project is the selection of relevant functional indicators and cost indicators.

2.1 Functional Analysis

With the gradual attention to the way of rural comprehensive development in China, the connotation of rural development began to expand from the place focusing on agricultural production to many aspects such as social governance, living standards and cultural inheritance. These changes mean that it is possible to evaluate the rural revitalization project from a functional perspective. Rural development is the root of the rural revitalization project. Therefore, some scholars try to establish functional indicators to evaluate the Rural revitalization project from the perspectives of rural economy, comprehensive development, rural vitality, rural nature and regional function, so that the evaluation index system of the Rural revitalization project has been strictly defined and measured[9]; then, based on the twenty character policy of rural construction, some scholars established an evaluation index system including five aspects: production development, affluent life, rural civilization, clean village appearance and democratic management[10]. Based on the general requirements of rural revitalization put forward in the report of the 19th National Congress of the Communist Party of China, and combined with the phased characteristics of rural revitalization function, this paper puts forward five functional indicators, such as rural industrial function, rural life promotion function, rural social governance function, rural ecological livable function and rural civilization construction function.

The internal attributes of the five functional indicators of the performance evaluation system of rural revitalization project have different characteristics. The function of rural industry is not only the core of rural economic construction, but also an important aspect and primary goal of rural revitalization. The prosperity of rural industry is the guarantee for the realization and expansion of other functions; the promotion function of rural life is the foundation of rural political construction. Only when farmers are rich and their living standards are improved, can rural revitalization have real practical significance; the function of rural social governance is the cornerstone of rural social construction. Effective rural social governance, efficient administrative treatment and personnel performing their respective duties are the institutional guarantee for the healthy and rapid development of rural areas; rural ecological livable function is the focus of ecological construction. Green

production and healthy life, rural development must not be at the expense of the environment; the function of rural civilization construction determines the effectiveness of rural cultural construction. Only by maintaining simple rural style and paying attention to inheriting culture can rural development form characteristics and roots. These five functional indicators have different development priorities, combined with the phased characteristics of rural revitalization, in order to build a more scientific, reliable and practical performance evaluation system of rural revitalization project.

2.2 Cost Analysis

Rural revitalization is a long-term and arduous project, and the resources that need to be invested are extremely huge. The rationality of the allocation of invested resources plays an important role in the performance level of rural revitalization project. According to the different attributes of resources involved in the promotion of rural revitalization, the cost indicators are divided into four aspects: economic cost, social governance cost, humanistic cost and ecological cost. What are most needed for the promotion of rural revitalization are real gold and silver economic resources. The investment mechanism and use mode of funds affect the construction of key projects and the development of key areas to a great extent. The core element of the cost index of the performance index evaluation system of rural revitalization project is economic cost; the promotion of rural revitalization needs the inclination of political resources as the institutional guarantee. The priority use of financial funds, the patent channel of preferential policies and the optimization and reform of rural system all need a lot of investment in social governance costs. Social governance costs are the guarantee for the efficient transformation of other costs; humanistic input plays a vital role in promoting rural revitalization. The effectiveness of material and system cannot completely determine the promotion speed of rural revitalization. Besides, rural customs, cultural background, moral standards and values restrict the implementation of rural revitalization. This "invisible hand" also has a key impact on the promotion of rural revitalization, The input of humanistic cost can promote the implementation of rural revitalization project with the help of the thrust of this hand; the ecological cost in the performance evaluation index system of rural revitalization project is the cost generated to restore or promote the ecological force serving some functions of rural revitalization[11]. This cost has the characteristics of macro-control, integrity and public welfare. The attributes of these four cost indicators are different, and their effectiveness in the evaluation index system of rural revitalization project is also different. Specific analysis can be carried out according to their associated functional indicators.

3. Construction of Performance Index Evaluation System of Rural Revitalization Project Based on Value Engineering

The value coefficient (V: rural revitalization project Performance) of value engineering is obtained by the ratio of function (F: realized benefit function) and cost (C: input resource cost). The evaluation index system consists of five functional indexes and economic costs, including rural industrial function, rural life improvement function, rural social governance function, rural ecological livable function and rural civilization construction function. It is composed of four cost indicators: social governance cost, cultural cost and ecological cost.

3.1 Construction of Index System

By sorting out the indicators in relevant literature such as rural revitalization evaluation and rural revitalization organization performance evaluation, and sorting and summarizing the performance evaluation indicators according to cost elements and functional elements according to the classification of indicator attributes, it can be used as the initial reference set of element indicators in the performance evaluation system of rural revitalization project based on value engineering. Finally, through the verification and consultation of relevant experts or participating staff of rural revitalization research, the initial index set is analyzed, classified and sorted out from the consideration of balance, systematicness, practicability and operability of the index system, hoping to make a more scientific interpretation of cost indicators and functional indicators, as shown in Table 1.

Table 1 Classification and summary of evaluation indicators.

Rural industrial function F1	Agricultural production F11	Export rate of agricultural products, proportion of characteristic and advantageous ag- ricultural products, integration rate of small-scale agricultural production and modern agriculture
	Nonagricultural production F12	The proportion of income from secondary and tertiary industries in the total income of farmers and the proportion of non-agricultural employment of rural labor force
	Rural labor force employment F13	Upper and lower limits of the left behind migrant rate of rural labor force and the age range of rural migrant workers*
Rural life improvement function F2	Farmers' income level F21	Villagers' disposable income, Engel coefficient, per capita housing area, number of cars owned by 100 families
	Rural living security F22	Coverage of new rural cooperative medical system, rural basic old-age insurance and rural minimum living security
	Rural informatization F23	Network access rate of rural households and the number of mobile phones owned by 100 Households
Rural social governance function F3	Rural grass-roots government F31	Service satisfaction rate of grass-roots organizations, farmers' satisfaction rate with the openness of government affairs and village affairs, farmers' satisfaction rate with the integrity of rural cadres, farmers' satisfaction rate with social security
	Rural grassroots personnel level F32	The proportion of rural cadres and college students, the average annual number of rural high-level talents introduced, and the number of scientific research institutes settled
Rural ecological livable function F4	Life and health F41	Construction of rural public toilets, popularization rate of household sanitary toilets and average life expectancy of the population
	Green production F42	Proportion of green ecological agricultural products and average application amount of organic fertilizer per mu
	Environmental protection F43	Upgrading progress of production and domestic sewage and garbage treatment rate and rural river water quality up to standard**
Rural civilization construction function F5	Rural recreational life F51	The proportion of farmers' cultural and entertainment expenditure, the coverage rate of village cultural and entertainment facilities, and the accessibility of farmers' cultural and entertainment activities
	Rural education development F52	Coverage rate of agricultural distance education, enrollment rate of rural children, education level of farmers***
Cost input C1	Economic cost C11	Expenditure on agricultural mechanization, investment in agricultural science and technology R & D, investment in rural infrastructure construction, financial subsidies for education and medical treatment, and possession and use of social funds****
	Social governance cost C12*****	Preferential tax policies, resistance to the fast track of grass-roots management system reform, investment in policies to attract talents and investment in maintaining social stability
	Human cost C13*****	Inheritance of characteristic cultural customs, protection of intangible cultural heritage, development of cultural industry, cultural and moral construction, interpersonal relationship management and shaping of values
	Ecological cost C14*****	Investment in greening project construction, direct and indirect loss of environmental pollution, investment in restoring environmental production capacity, and investment in large-scale allocation of rural means of production

Note: "*" the higher the upper limit and the lower the lower limit, the lower the score; "**" belongs to a rural river: according to China's water quality classification standards, it will be promoted from the current level to the previous level until level I; the shorter the period, the higher the score; "***" illiteracy accounts for the proportion of the population aged 15 and over; "****" opportunity cost of social capital investment and occupation; "*****" the subordinate indicators are mostly compound cost element indicators, including quantifiable material inputs and non-quantifiable non-material inputs.

According to Table 1, the performance evaluation indexes of rural revitalization project are classified and summarized. Therefore, a performance evaluation index system of rural revitalization project integrating scientificity, feasibility and highlighting key points is constructed, as shown in Figure 1.

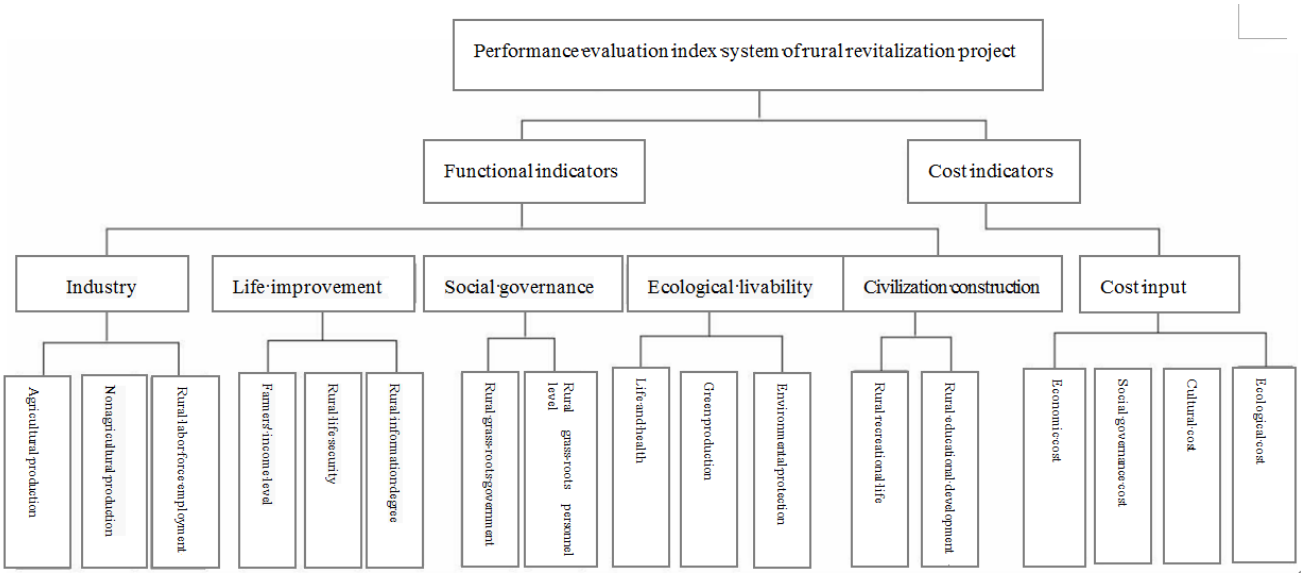

Figure 1 Performance evaluation index system of rural revitalization project.

3.2 Reliability and Validity Test

This paper sets up a "feasibility questionnaire of index system" including 9 primary indicators, hoping to test the practical operability and validity of evaluation index factors in performance evaluation through the reliability and validity test of evaluation index system, so as to verify the structural dimension of performance evaluation of rural revitalization project. Ten rural revitalization theory research experts, 25 rural basic government staff and 50 rural senior high school or above were selected as the objects of the questionnaire survey, making the data more reliable and representative.

3.2.1 Reliability Test of Index System

Structural consistency verification is an important method to test the reliability of evaluation index system. Using the Cronbach a coefficient method in the data processing tool SPSS 20.0, the internal consistency of the index system is verified by sorting and summarizing the reliability test data of the questionnaire, and the results in Table 2 are obtained. It can be seen that the values of Cronbach a coefficient in Table 2 are greater than 0.6. Therefore, the internal structure of this index system is reasonable and has good reliability.

Table 2 Reliability test table of index system.

System index	Cronbach a coefficient
Rural industrial function F1	0.894
Rural life improvement function F2	0.862
Rural social governance function F3	0.721
Rural ecological livable function F4	0.857
Construction function F5	0.735
Cost input C1	0.813
Total amount table	0.867

3.2.2 Validity Test of Index System

This paper tests the validity of the performance evaluation index system of rural revitalization project from

the perspective of content validity, and determines the correlation between the evaluation index and the actual situation by inviting relevant experts or practitioners to evaluate the fit between each index item and the research theme one by one. In the validity test of the data obtained by this method, according to the validity test results of each index system in Table 3, the functional indicators have high validity based on the five dimensions proposed by rural revitalization, in which the validity ratio of F11, F12, F21, F22 and F41 is 1, and the validity of other indicators is also higher than 0.6. Therefore, the performance evaluation system of rural revitalization project has high validity.

Table 3 Content validity ratio of each index.

System index	Cronbach a coefficient
F11	1
F12	1
F13	0.976
F21	1
F22	1
F23	0.874
F31	0.725
F32	0.782
F41	1
F42	0.636
F43	0.818
F51	0.873
F52	0.856
C11	0.912
C12	0.834
C13	0.685
C14	0.742

4. Construction of Performance Comprehensive Evaluation Model of Rural Revitalization Project Based on Value Engineering

Through the basic research on the application of value engineering in the performance evaluation of rural revitalization project and the construction of evaluation index system, it can be seen that the restrictive relationship between the two basic factors of function coefficient and cost coefficient shows the results of the performance evaluation of rural revitalization project. In this evaluation index system, functional elements and cost elements are the main basic elements of the management performance evaluation index system, and each data should also be measured quantitatively based on them. Therefore, when constructing the performance comprehensive evaluation model of rural revitalization project, we can conceive from both the constituent elements, functions and costs of value engineering.

4.1 Determining Factor Weight of Index Layer

Functional elements and cost elements constitute the performance evaluation index system of rural revitalization project, and there is a certain relationship and restriction between the factors at each index level, and there is a strong interaction. Shapley value method is a non-additive measure weight determination method that pays attention to the interaction of indicators and the balance of weight distribution. Because the traditional weight determination method based on additive measure is no longer applicable to the index weighting of this evaluation model, the application of Shapley value method in factor weight assignment at the index level has

become the best choice.

The weighting process of index layer factors by Shapley value method is as follows:

1) Firstly, L experts are asked to assign the importance of n indicators; collect and summarize the data for normalization, and obtain the initial value of the importance of each indicator:

$$v_i = \frac{\sum_{j=1}^{n} a_{ij}}{\sum_{i=1}^{n}\sum_{j=1}^{n} a_{ij}} \qquad i = (1,2,3,\cdots n) \tag{1}$$

Secondly, randomly combine the indicators, judge the k value of the index joint contribution coefficient from the interaction degree of L experts on each index in the formed combination from the values in Table 4, and judge the combination correlation coefficient through the maximum membership of each contribution coefficient, so as to determine the combination importance:

$$V(1,2,3,\cdots n) = k\sum_{i=1}^{n} V(i) \tag{2}$$

in which $v(i) \in [0,1]$.

Table 4 Index joint contribution coefficient k.

Relationship between indicators	Strong commonality	Relatively independent	Relatively independent	Weak mutual aid	Strong mutual aid
Value of coefficient k	0.65	0.85	1	1.15	1.35

Note: the index joint contribution coefficient k in the table is obtained by combining the special relationship between the three elements of the performance evaluation index of rural revitalization Project and improving the existing coefficient k value relationship in relevant literature, so as to make the construction of the evaluation model more reliable and accurate.

3) Finally, calculate the weight of each index, that is, the Shapley value of each index:

$$w_i = sh_i(N,V) = \sum_{S\subset N, i\subset S}^{n} \varpi(s)\left[v(s) - v(S/i)\right] \tag{3}$$

$$\varpi(s) = \frac{(s-1)!(n-s)!}{n!} \tag{4}$$

The factor weight value of each indicator layer of the above rural revitalization project performance can be determined according to the importance of any combination of other indicators in its set and through calculation.

4.2 Determining Factor Weight of Criteria Layer

The criterion level factors of the performance evaluation system of rural revitalization project are composed of rural industrial function, rural life improvement function, rural social governance function, rural ecological livable function, rural civilization construction function and cost investment. This paper adopts the triangular fuzzy number method to deal with the qualitative data with strong fuzziness, which can take into account the large correlation and restrictive relationship between the criteria level factors, eliminate the relative fuzziness of the appraisers' personal cognition and the evaluation object, and reduce the uncertainty in the weighting process of the criteria level factors.

The weighting process of criteria layer factors by trigonometric method is as follows:

1) Firstly, let L experts judge the importance of N indicators based on their professional knowledge and skills, judge the triangular fuzzy value from the semantic evaluation value of importance in Table 5, sort out and summarize the data, and then obtain the fuzzy weight value of indicators at each criterion level:

$$\widetilde{A}_i = \frac{1}{L}\sum_{j=1}^{L}\widetilde{A}_{ij} \quad i = 1,2,3\ldots n \tag{5}$$

Table 5 Triangular fuzzy value corresponding to semantic evaluation value of index importance.

Degree semantic evaluation	Triangular fuzzy value
Least important	(0, 0.1, 0.1)
Unimportant	(0.1, 0.2, 0.3)
Less important	(0.3, 0.4, 0.5)
Commonly	(0.5, 0.6, 0.7)
Important	(0.6, 0.7, 0.8)
More important	(0.8, 0.9, 1)
Very important	(0.9, 0.9, 1)

Note: Based on the 7-point Likert scale, the 7-level semantic evaluation scale is set.

2) Secondly, the fuzzy weight value is defuzzified into an accurate value. Since the single conversion formula is easy to operate and its effectiveness cannot be reliably verified, the value $\overline{A'}$ obtained by distance measurement method, the value $\overline{A''}$ obtained by center method and the value $\overline{A''}$ obtained by center of gravity method are combined and re-averaged to ensure the reliability of the result. The result $\overline{A_i}$ can be expressed as:

$$\overline{A}_i = \frac{1}{3}\left(\overline{A}_i' + \overline{A}_i'' + \overline{A}_i'''\right) \tag{6}$$

3) Finally, normalize the index weight value to obtain the relative weight value:

$$\varpi_i = \frac{\overline{A}_i}{\sum_{i=1}^{n}\overline{A}_i} \tag{7}$$

4.3 Determination of Function Coefficient and Cost Coefficient Based on Fuzzy Comprehensive Evaluation

The implementation of rural revitalization has the characteristics of long implementation process and complex stakeholders. The information in this process is complex, trivial and difficult to obtain. Therefore, it is difficult for evaluators to make accurate effect judgment according to the implementation of the process, and the degree semantic evaluation value can better express the evaluation preference more in line with the actual situation. Therefore, the trapezoidal fuzzy number method can be used to quantify the opinion information of evaluators, and the output of function coefficient and cost coefficient can be obtained by comprehensive weighting.

The process of determining function coefficient and cost coefficient by fuzzy comprehensive evaluation is as follows:

Table 6 Trapezoidal fuzzy value corresponding to semantic evaluation value of index importance.

Degree semantic evaluation	Triangular fuzzy value
Least important	(0, 0, 0.1, 0.1)
Unimportant	(0.1, 0.2, .0.25, 0.3)
Less important	(0.3, 0.35, 0.4, 0.5)
Commonly	(0.5, 0.55, 0.6, 0.65)
Important	(0.6, 0.7, 0.75, 0.8)
More important	(0.8, 0.85, 0.9, 1)
Very important	(0.9, 0.9, 0.95, 1)

Note: Based on the 7-point Likert scale, the 7-level semantic evaluation scale is set.

1) Firstly, L experts in the field of rural revitalization theory are asked to judge the completion degree of n indicators of rural revitalization project evaluation, and sort out and summarize the data based on the degree semantic evaluation value (Table 6) and its corresponding trapezoidal fuzzy value, so as to obtain the fuzzy evaluation of each index:

$$\widetilde{A}_i = \frac{1}{L}\sum_{j=1}^{L}\widetilde{A}_{ij} \tag{8}$$

2) Secondly, the trapezoidal fuzzy number is defuzzified based on the trapezoidal fuzzy center value:

$$\overline{A}_i = \frac{1}{2}(x+y),\ i=(1,2,3\ \ldots\ n) \tag{9}$$

In the formula,

$$x = \frac{1}{3}\left[a+b+c+d-\frac{dc-ab}{(d+c)-(a+b)}\right],$$

$$y = \frac{1}{3}\left[1+\frac{c-b}{(d+c)-(a+b)}\right].$$

3) Finally, the required cost coefficient and function coefficient are obtained by synthesizing the index evaluation value after weighted defuzzification:

$$A = \sum_{i=1}^{n}\varpi_i\overline{A}_i \tag{10}$$

4.4 Determination of Value Coefficient

Through the quantitative process of the above evaluation index information, the cost coefficient and function coefficient that can quantify the implementation effect level of rural revitalization are obtained, and the final value coefficient is obtained by applying the basic principle of value engineering:

$$V = \frac{F}{C} \tag{11}$$

4.5 Analysis of Performance Evaluation Results of Rural Revitalization Project Based on Value Engineering

The performance evaluation of rural revitalization project based on value engineering can obtain the balance point between function realization effect and costs input, and improve the function effect and input cost conversion efficiency in the implementation process. The implementation of rural revitalization can neither blindly invest the cost because of the pursuit of time, nor ignore the progress just to reduce the cost. It needs to achieve a most satisfactory balance. Therefore, the evaluation can start from the performance level of rural revitalization, complete the realistic evaluation of the performance of rural revitalization project by quantitatively calculating the functional index system and cost index system to the reliable value coefficient, and analyze the optimization direction of value engineering by using the classical measurement standard V = 1 of value engineering.

The performance evaluation criteria and situation analysis of rural revitalization project are as follows:

The last step of performance index evaluation is to judge the performance level of rural revitalization project with the help of value coefficient. Therefore, in order to judge the performance level and resource input efficiency level of rural revitalization project more accurately and reduce the relationship error between data and performance and efficiency in the process of performance evaluation, this paper selects the confidence interval

of mathematical statistical knowledge to judge the performance level more scientifically and reliably. According to the relevant literature and practical discussion on the evaluation of national policy revitalization and implementation, the performance evaluation standard and corresponding coefficient of rural revitalization project Based on value engineering are formulated, as shown in Table 7.

Table 7 Performance evaluation criteria of Rural Revitalization Project.

Evaluation grade	Excellent	Good	Qualified	Focus on optimization
Value coefficient	(0.98, 1.02)	(0.93, 0.98] ∪ [1.02, 1.07)	(0.85, 0.93] ∪ [1.07, 1.15)	Others

It can be seen from Table 7 that the performance evaluation results of rural revitalization project based on value engineering are divided into three cases with the standard line V = 1 as the boundary:

1) When V is very close to 1, the adaptation level of function and cost is the best, reaching the most satisfactory state of project management performance, and the resource investment and function effect of rural revitalization reach the best matching degree to realize the expected value;

2) When V is far away from 1 and less than 1, the resource input cost of the existing function effect achieved in the implementation process is high, and the excess capital is invested to obtain the existing performance level, the project function and resource input mechanism should be analyzed and corrected to reduce unnecessary resource waste;

3) When V is far away from 1 and greater than 1, first check the actual effectiveness of the functions realized in the implementation of rural revitalization, and analyze whether all the functions realizing rural revitalization are reasonable and practical significance: first, if the functions are unreasonable and lose their actual role, these functions should be reduced or corrected, to optimize the rational allocation of resources invested in rural revitalization; second, if the goal is reasonable and has rich practical significance, but the resource investment is lower than expected or the follow-up investment is out of line, check whether the quality of the completion of the necessary functions of the project meets the standards, and add resource investment or improve the resource investment mechanism to ensure that the performance level of the township revitalization project is within a reasonable range.

Summarizing and analyzing the above three situations can provide clues for finding the causes of the non-compliance of the performance level of rural revitalization project, and put forward improvement opinions and directions more in line with the actual situation for the correction of phased objectives in the implementation process of Rural Revitalization based on the evaluation results and the recreation of value engineering scheme.

5. Conclusion

Value engineering theory has been widely used in many industries in China, especially in the manufacturing industry and real estate industry. Through the sorting of existing literature and the collection of expert opinions, this paper determines the contents of functional element indicators and cost element indicators, based on the value engineering theory, this paper constructs the performance evaluation index system and model of rural revitalization project, uses Shapley method, triangular fuzzy number method and fuzzy comprehensive evaluation method to weight the index and quantify the data of functional elements and cost elements, and takes the value coefficient as the evaluation standard of the performance level of rural revitalization project. It can not only judge the performance level of rural revitalization project, but also analyze the resource utilization efficiency in the implementation of rural revitalization. Finally, based on the confidence interval of mathematical statistical knowledge, the performance evaluation standard coefficient is formulated, and the reflection of its different values is analyzed, it points out the direction for putting forward performance optimization measures in the implementation of rural revitalization. In the future, the performance evaluation index system of rural revitalization project can be constructed in combination with other relevant project management theories. The

weighting of evaluation indexes can not only cooperate with analytic hierarchy process, but also be used together with fuzzy comprehensive evaluation method and other potential methods, so as to make the weighting process more scientific and reliable.

Conflict of Interest

The authors declare that they have no conflict of interest.

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