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A RESEARCH ON QUALITY MANAGEMENT OF A LANDSCAPE ENGINEERING PROJECT IN UAE

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Abstract

As an important part of the construction of green ecological civilization, landscape engineering is an important infrastructure of a city. The UAE government has made great efforts for sustainable development, especially in the construction of landscape cities and forest cities. However, in the construction of a large number of urban garden projects in the United Arab Emirates, various engineering problems have been exposed, management is extensive, resources are wasted, and efficiency is low. This article fully read the relevant literature and related cases, and introduced improved neural network technology into quality management to construct a UAE-based landscape engineering project quality management system based on neural network. Thus, the key elements of the quality of landscape engineering projects can be obtained, which will provide reference for the construction of garden projects in the UAE. It has certain reference and reference role for the healthy development of UAE's landscape engineering construction and the practice of green ecological civilization construction.

Keywords: Landscape engineering; Project management; Quality control; Neural Network Technology

INTRODUCTION

Since 2004, the UAE has increased its investment in infrastructure construction and the UAE has embarked on a highway to economic development. Since then, it has become the capital of the construction industry in the Gulf region. At the same time, people's ideological awareness of protecting the environment and improving the environment has been continuously improved, and the quality of the human living environment has also had new standards and requirements. Landscape engineering construction companies have shown unprecedented vigorous development. The quality of garden engineering construction is the core of project management and is the key to the success of the project. From the analysis of the overall meaning of quality management of landscape construction, this topic analyzes some phenomena occurring in the process of current garden construction management, discusses the practical and effective methods of quality management during construction, and achieves the purpose of improving the quality of landscape engineering.

Many scholars at home and abroad have studied engineering quality and neural networks. Alba N. Zaretzky introduced the quality management system of complex organizational systems and established corresponding models. The viewpoint of Daniel L. Moody and Graeme G shanks is that the most important thing for the management of the construction process is to put quality management in the center, and the factors influencing the quality of the project are complex. It is necessary to carry out systematic management and control of the influencing factors. Since the 1980s, research on neural networks has gradually increased, and various network models have emerged, such as Hopfield networks, bidirectional associative memory networks, two-way propagation networks, etc. Therefore, the combination of neural network and engineering quality is an important research.

This article will use a garden project in the United Arab Emirates as an example to explain the concept of landscape engineering quality management and the content of it, and according to the characteristics of the construction of the garden project, to discuss the quality management of landscape construction. On this basis, the use of neural network technology, analysis of the United Arab Emirates a garden project existing problems, and analyze the causes of its problems, and finally, put forward to improve the project quality management strategies and recommendations.

METHODOLOGY

Many companies in the United Arab Emirates have many deficiencies in the quality management and control of the garden project construction phase. This study analyzes the causes of various problems. The quality of the engineering of a garden project is the quality of

all the processes in the construction. The quality of each process determines the final quality of the project. Therefore, it is necessary to conduct comprehensive quality management and control of all processes in order to obtain high-quality garden engineering construction.

In recent years, with the in-depth study of neural network related theories, it has been gradually applied to the field of engineering management and has made great progress, such as cost forecasting, quality evaluation and so on. The application of neural network in the field of engineering management is based on its ability to systematically deal with non-linear problems, and it can provide reasonable quantitative basis for judging and solving complex nonlinear problems.

In summary, it is feasible to apply the neural network to engineering quality control, and there are many other methods that are incomparable to the analysis of quality problems, which can provide necessary theoretical and practical basis for quality control of construction enterprises.

ANALYSIS AND RESULTS

Determination and Processing of Neural Network Model Data

Through the application of the "preferential comparison method" method, the quality management of the 15 projects was compared with each other. That is to say, comparing each item on the left side with each item on the top row, one point is more important, and zero points is relatively less important. After a round of comparison, the scores for each project on the left are summed, and after correction, the score for the quality management of each project is taken as the proportion. To this end, the indicator is quantified. The results are shown in Table 1.

Table 1. The quantitative results of quality management situation

Engine-ering	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum	Correction	%
1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	15	0.125
2	0		1	0	1	1	0	1	0	1	1	1	1	1	0	9	10	0.083
3	0	0		0	1	0	0	0	0	0	1	1	0	0	0	3	4	0.033
4	0	1	1		1	1	1	1	0	1	1	1	1	1	0	11	12	0.100
5	0	0	0	0		0	0	0	0	0	1	1	0	0	0	1	2	0.017
6	0	0	1	0	1		0	0	0	0	1	0	0	0	0	4	5	0.042
7	0	1	1	0	1	1		1	0	1	1	1	1	1	0	10	11	0.092
8	0	0	1	0	1	1	0		0	1	1	1	1	1	0	8	9	0.075
9	0	1	1	1	1	1	1	1		1	1	1	1	1	1	13	14	0.117
10	0	0	1	0	1	1	0	0	0		1	1	1	0	0	6	7	0.058

11	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	1	0.008
12	0	0	0	0	1	0	0	0	0	0	1		0	0	0	2	3	0.025
13	0	0	1	0	1	1	0	0	0	0	1	1		0	0	5	6	0.050
14	0	0	1	0	1	1	0	0	0	1	1	1	1		0	7	8	0.067
15	0	1	1	1	1	1	1	1	0	1	1	1	1	1		12	13	0.108

Tab 1...

Using the same method, we quantified the indicators for "implementation of the program technology." The results are shown in Table 3.

Table 2. The quantitative results of scheme clarification

Engin-eering	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sum	Correction	%
1		1	1	0	1	1	1	1	1	1	1	1	1	1	1	13	14	0.117
2	0		1	0	1	1	1	1	1	1	1	1	1	1	1	12	13	0.108
3	0	0		0	1	1	0	0	0	0	0	0	0	0	0	2	3	0.033
4	1	1	1		1	1	1	1	1	1	1	1	1	1	1	14	15	0.125
5	0	0	0	0		1	0	0	0	0	0	0	0	0	0	1	2	0.017
6	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1	0.008
7	0	0	1	0	1	1		0	0	0	1	1	1	1	0	7	8	0.067
8	0	0	1	0	1	1	1		0	0	1	1	1	1	0	8	9	0.075
9	0	0	1	0	1	1	1	1		1	1	1	1	1	0	10	11	0.092
10	0	0	1	0	1	1	1	1	0		1	1	1	1	0	9	10	0.083
11	0	0	1	0	1	1	0	0	0	0		0	1	0	0	4	5	0.042
12	0	0	1	0	1	1	0	0	0	0	1		1	0	0	5	6	0.050
13	0	0	1	0	1	1	0	0	0	0	0	0		0	0	3	4	0.033
14	0	0	1	0	1	1	0	0	0	0	1	1	1		0	6	7	0.058
15	0	0	1	0	1	1	1	1	0	1	1	1	1	1		11	12	0.100

Neural Network Model Training and Simulation

The training sample set used in this article is the first 13 projects. After the normalized 13 projects, each project has 17 quality control data, a total of 221 data, as shown in Figure 1. The training target value is the result of the quality evaluation of 13 projects, as shown in Figure 2.

Figure 1. Input data

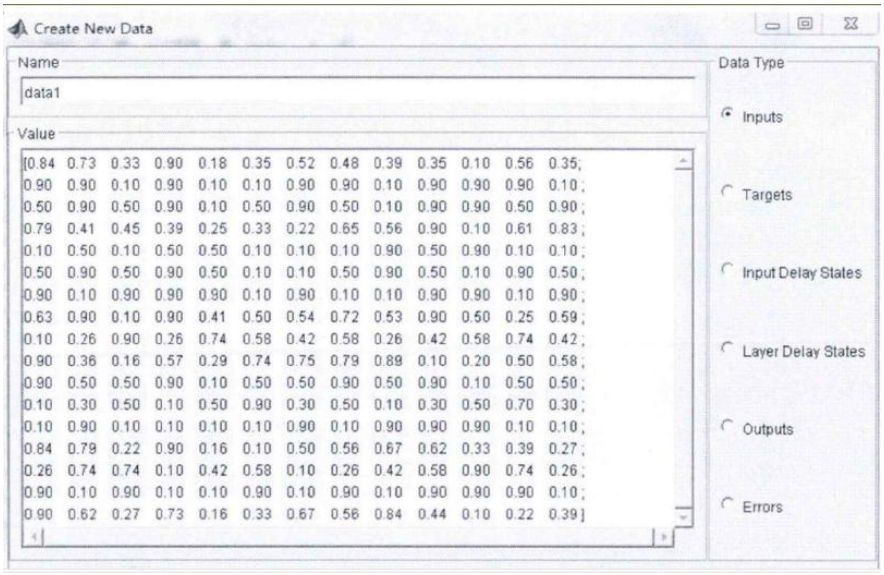
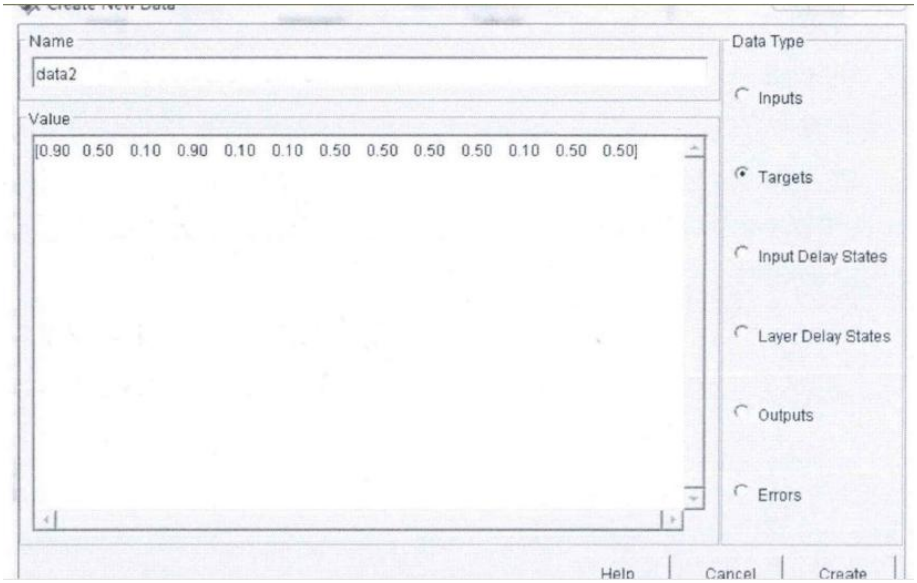
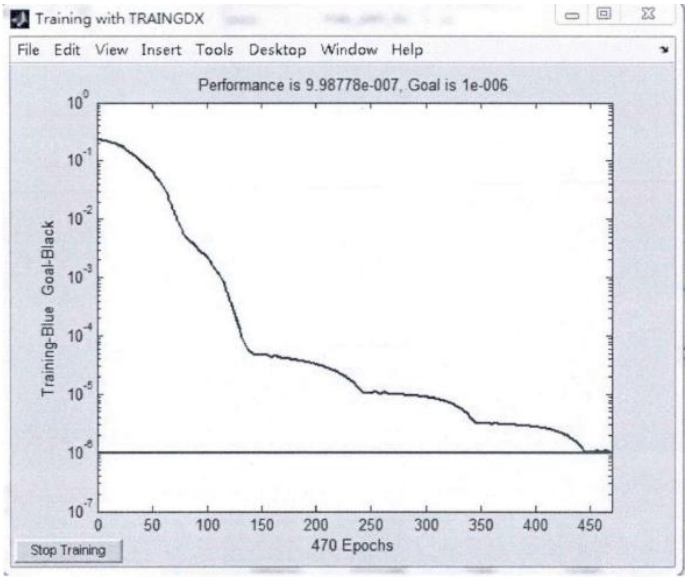


Figure 2. Target data



After the input and output data are input, establish the network required by this article.After setting the parameters, start the training and you can see the error curve in the training process, as shown in Figure 3.

Figure 3. The error curve

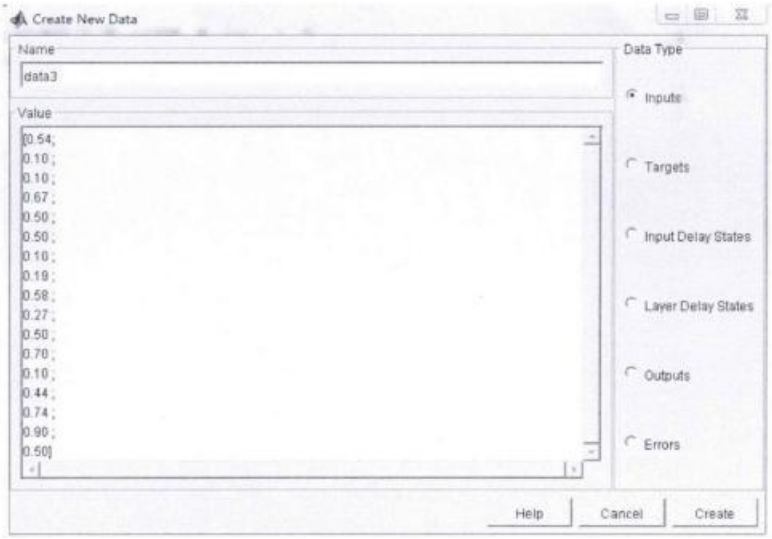


From Figure 3, we can see that after only 470 trainings, the actual error and the target error have intersected. The training error has dropped to the error level set in this paper, and the network training is over. This also shows that the improvement of the parameters of network training in this paper is reasonable, and can achieve rapid reduction of network errors and save a lot of training time.

In the foregoing, the original data of these two projects have been normalized. The normalized input data is shown in Fig. 4 and Fig. 5. The input data of project 14 is data3, and the input data of project 15 is data4.

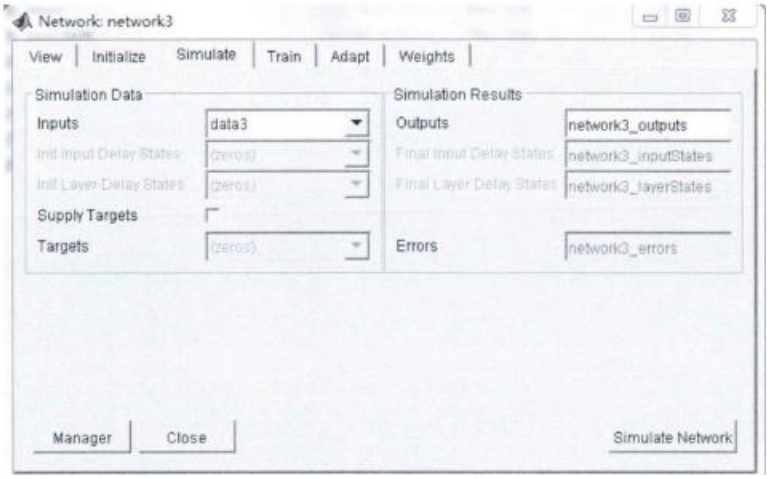
Figure 4. The input data of engineering 14

Figure 5. The input data of engineering 15



The simulated network is checked by the simulated function to see if it can meet the error requirement.The specific operation is shown in Figure 6.

Figure 6. Simulation interface



After inputting training data for the input data of Engineering 14 and Engineering 15 one by one, the output results are shown in Figure 7 and Figure 8.

Figure 7. The simulation result of engineering14

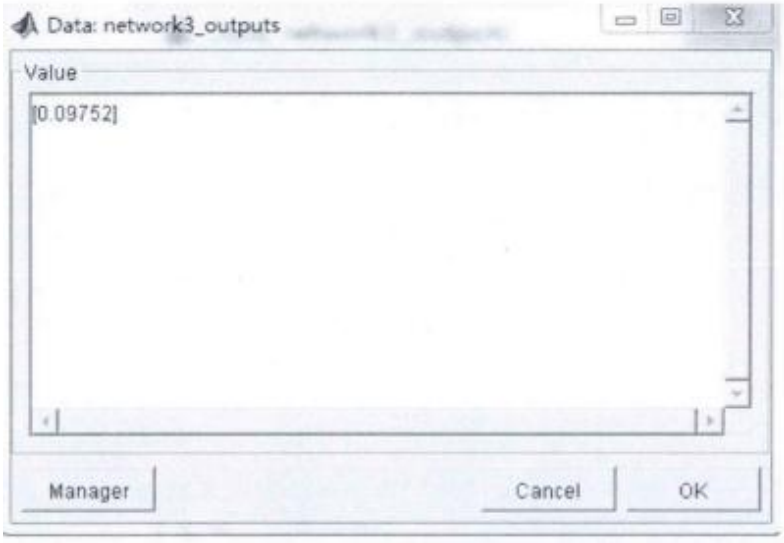
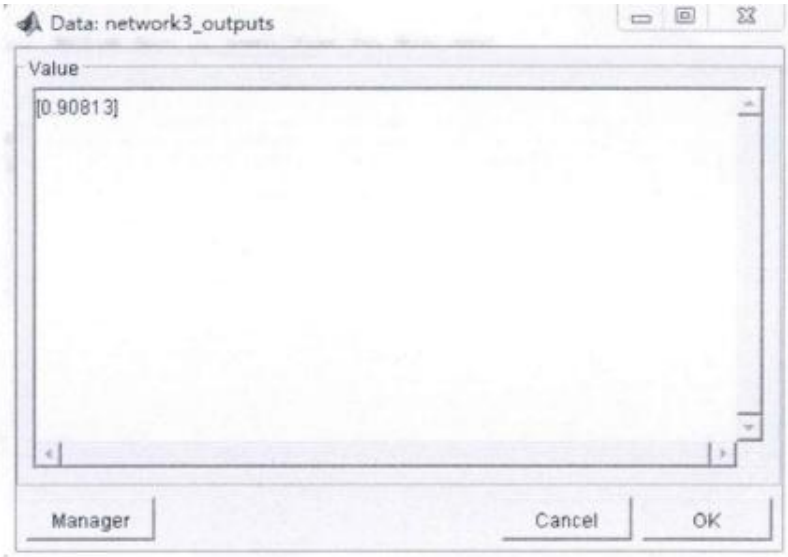


Figure 8. The simulation result of engineering15



Model verification results analysis

The calculation result of the engineering 14 input model is 0.095804, and the actual evaluation value is 0.1. The error is:（0.1-0.09752）/0.1=2.48%,

The calculation result after the engineering 15 input model is 0.90502, and the actual evaluation value is 0.9. The error is:（0.90813-0.9）/0.9=0.9033%。

Due to the characteristics of the training sample selected in this paper and the problem of the number of samples, certain errors are inevitable. However, the simulation results and the actual evaluation values are basically the same, the error is within a reasonable range, and the

trained network model can meet the needs of engineering data analysis. This proves that the quality control system established in this paper and the BP network constructed on this basis can reflect the quality rules of such projects well. The information obtained through the network model is used to analyze related engineering quality issues.

Through the analysis of the results, compared with the traditional method of engineering quality control, the application of neural network in quality control provides a brand-new idea for construction companies, and establishes the importance of the influencing factors of engineering quality on the basis of quantitative analysis. The construction quality control model based on neural network helps the construction company to have targeted and focused prevention work for quality control, and provides a basis for the scientific management of the project, avoiding eyebrows and beards, and improving management efficiency. This is also the most effective pre-control concept for quality management, reducing the cost of repairs after quality problems in later periods. For the key influencing factors, this paper puts forward reasonable guidance suggestions and can provide a certain basis for the relevant enterprises to formulate detailed pre-control measures. In the implementation of the pre-control measures formulated, it is necessary to comprehensively use the PDCA cycle control method to timely find the quality problems in the construction process and correct them.

CONCLUSIONS AND DISCUSSION

In the current era, the awareness of the green circular economy has been deeply rooted in the hearts of the people. While working to develop the economy, the UAE is also seeking environmental development and striving to create a city where people can feel happy. It can also be seen that the environmental factors of a city have become an important factor affecting people's quality of life. Therefore, the current vigorous promotion of landscape engineering construction is in line with the material and cultural needs of the people, which is an important manifestation of national progress.

At the same time, garden engineering construction is one of the important components of the UAE construction industry, which is of great significance to the improvement of people's quality of life. However, any industry will inevitably have a series of problems while it is developing rapidly. This paper discusses the problems of universal quality management faced by landscape engineering. In-depth study of the ins and outs of quality management, and through the literature review and case analysis method to further combine theory and practice, the combination of knowledge and practice, in this research process is also the progress of their own research and study.

Therefore, this paper selects representative garden projects for analysis in engineering quality management, analyzes global problems with universal problems, and hopes to provide valuable suggestions for quality management of other similar projects. Therefore, the United Arab Emirates will contribute its own meager strength to the development of green ecological civilization, and provide research references for later generations.

LIMITATIONS AND FURTHER STUDIES

The current study has certain limitations:

(1)In the selection of samples, the training samples must be selected in a targeted manner, so these data cannot be applied to all engineering projects. For the selection of evaluation indicators, in order to reflect the overall and typical nature of the indicator system, it is inevitable to select some qualitative indicators, and the indicators in quantitative representation are relatively scarce.

(2)Due to the characteristics of the training samples selected in this paper and the number of samples, the results of the simulation and the actual evaluation values will be different. The network model obtained by the training will have an impact on the analysis of engineering data.

In the future research, we need to further study the following issues:

(1)The quality of engineering construction projects from exploration, design, and construction during the construction process is changeable. Therefore, the project construction project quality evaluation index system needs to be further improved. It is hoped that some dynamic considerations can be added on a static basis.

(2)This article has some research and achievements in the system, but it needs further analysis and study in the detailed evaluation and evaluation of the project.

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